

PACIOLI 15 workshop presentations

Integration of farm accounting in research and statistics

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Agricultural Economics Research Institute (LEI), The Hague

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- Statutory and service tasks
- Business development and competitive position
- Natural resources and the environment
- Land and economics
- Chains
- Policy
- Institutions, people and perceptions
- Models and data

PACIOLI 15 workshop presentations; Integration of farm accounting in research and statistics

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The PACIOLI network explores the need for and feasibility of innovation in farm accounting and its consequences for data gathering for policy analysis in Farm Accountancy Data Networks (FADNs). PACIOLI 15 was held in Aulanko, Finland, in September 2007. The theme of the workshop focused on the need for integration and harmonisation in agricultural micro-economic data sets, due to globalisation, and its consequences for FADNs.

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Preface

Due to globalisation and related changes in policy, policy makers and researchers have new data needs to monitor how farmers change their business practices and how this affects their income, wealth and environmental performance. The globalisation process also means that international comparability, and integration of micro-economic agricultural statistics with other statistics is becoming a high topic on the agenda for managers of such data collection systems. For Farm Accountancy Data Networks (FADNs) and comparable micro-economic datasets (such as ARMS in the USA), such developments imply new challenges to come up with relevant data.

To exchange experiences in this domain the PACIOLI network yearly organises a workshop. In 2007 the group met in Aulanko, a community in Finland, north of Helsinki. This report contains the papers or presentations from the PACIOLI 15 workshop as well as the reports from the work group discussions.

As in previous occasions, Krijn Poppe took the initiative for this meeting, and he chaired the three-day workshop. Koen Boone designed the scientific programme and planned the work group discussions. Colinda Teeuwen-Vogelaar took care for the organisation of the workshop. After 15 PACIOLI workshops Krijn Poppe will hand over the future organisation to Koen Boone, and hopes to become an ordinary participant.

We are indebted to our colleagues of MTT Economic Research in Finland who, under the leadership of Maija Puurunen, took care for all the local arrangements. This included a visit to the castle of Aulanko, a regional historic farm, the headquarters of MTT and a wine making (!) business. Desiree den Heijer took care of the text processing for the publication.

We are happy that a large group of colleagues came to the workshop and contributed to the program. Over the last years the PACIOLI network has been extended to EU-accession countries, associated countries like Norway and Switzerland, as well as to international organisations like OECD and North American countries. The network finds this globalisation very useful, as heterogeneity supports innovation. We expect that 2008 will bring the 16th edition of the PACIOLI network, sometime, somewhere. Check our website www.pacioli.org for upcoming details.



Dr. R.B.M. Huirne
Director General LEI

1. Introduction

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 15th edition took place. This small but open network has become a breeding place for ideas on innovations and projects.

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.

1.1 Theme of PACIOLI 15

Agriculture is more and more treated as a normal economic activity. Policy makers would therefore like to compare agricultural statistics with statistics from other economic sectors. There is also a growing interest in comparing FADN data in an international context (for example in EU policy evaluation). Popular research topics like sustainability, rural development and entrepreneurship have such a broad coverage that it is essential to combine information from very different sources.

Technological developments (for example internet, electronic identification and XML), decreasing FADN budgets, and a growing attention for decreasing the administrative burden of farmers, make it more and more attractive to re-use data that is already available in electronic format. Internet makes FADN data available for a much wider group of users all over the world.

All these developments lead to a growing interest from both the user side and supplier point of view to harmonise FADN with other databases and to harmonise FADN's between countries and was therefore the theme of the 15th PACIOLI workshop.

1.2 PACIOLI 15 programme

Sunday, 9 September 2007

- 16.00 Bus from Helsinki centre to the airport
(Kiasma bus stop, Mannerheim str. in front of the main Post office and equestrian statue)
- 16.45 Bus from Helsinki-Vantaa Airport to Aulanko, Hämeenlinna
- 18.00 Arrival and accommodation at Rantasipi Aulanko Hotel
- 21.00 Get together at Rantasipi Aulanko in Winter Garden

Monday, 10 September 2007

- 09.00 Welcome, introduction workshop programme (Krijn Poppe)
- 09.15 Welcome, Kyösti Pietola, MTT Economic Research

Session I: Finnish agriculture

- 09.30 'Finnish agriculture today and a foresight to the future'
Jyrki Niemi, MTT Economic Research
- 10.00 'Measuring productivity and productivity differentials in Nordic countries - an application on FADN data'
Timo Sipiläinen, MTT Economic Research
- 10.30 Break

Session II: Innovations in FADN

- 10.45 'A new farm accounting data network for Flanders'
Ester van Broekhoven, Flemish government, Department of Agriculture and Fisheries
- 11.15 'Main issues in the renewal of the IT system of the Irish FADN'
Brian Moran, Teagasc
- 11.45 'A milk marketing probe within the French FADN'
Dominique Desbois, INRA-SCEES and Jacques Nefussi, AgroParisTech - INRA
- 12.15 Lunch

Session III: Providing FADN data to users

- 13.15 'Remote Access: Optimal compromise between data use and privacy protection'
Hans Vrolijk, LEI
- 13.45 'Internet based FADN reporting system'
Arto Latukka, MTT Economic Research

14.30 Break

14.45 -16.15 Workgroup session 1
'Providing FADN data to users'

Session IV: Towards Global Networks of Data-exchange

16.15 'OECD network'

Catherine Moreddu, OECD

16.45 'The net value added approach as a tool for integration at the micro level'

Ted Covey, ERS/USDA, Koen Boone/Krijn Poppe, LEI

17.15 Snack

17.30 - 19.00 Workgroup session 2

'Towards Global Networks of Data Exchange: What data to Exchange?'

19.00 -19.30 '15 PACIOLI workshops'

Krijn Poppe and Koen Boone, LEI

20.00 Dinner (buffet table)

Tuesday, 11 September 2007

Session V: Harmonisation of FADN with other statistics and practice

9.00 'Integration of FADN in EAA in Macedonia'

Anita Stamnova, State Statistical Office of the Republic of Macedonia

9.30 'FADN in space'

Erling Andersen, Danish Centre for Forest, Landscape and Planning

10.00 'Harmonisation of FADN with practice'

Koen Boone, LEI

10.30 Break

Session VI: Research with FADN data

10.45 'Possible effects of CAP on Estonian FADN'

Eduard Matveev, Rural Economy Research Centre

11.15 'Income Volatility in the EU'

Hans Vrolijk, LEI

11.45 'Results of a survey about methodology in national FADN's'

Kaspar Muehlethaler, ART

12.30 Break for departure for excursion

13.00 Excursion

Excursion program

13.00 Visit MTT Jokioinen and Häme Polytechnic, Lepaa

Bus for PACIOLI participants from Rantasipi Aulanko

13.30 Lunch (buffet table: Finnish traditional food) at the Museum Estate of Hevos-silta

15.30 Arrival at MTT Jokioinen Estate / Coffee

Welcome to the MTT Agrifood Research Finland, Erkki Kemppainen, Dir. Gen.

MTT' s Research Programme, Ilkka P. Laurila, Development Director

17.00 Departure for Häme Polytechnic Lepaa by bus

19.00 Introduction to Häme Polytechnic Lepaa and its wine production
Dinner

23.00 Departure for Rantasipi Aulanko by bus (arrival ab. 23.30 hrs)

Wednesday, 12 September 2007

Session VII: Typology and Other Gainful Activities

9.00 'Typology'

Sophie Helaine, EU - DG AGRI

9.30 'Different definitions of Other Gainful Activities in agricultural statistics and its implications for the use of statistics'

Ann-Marie Karlsson, Swedish Board of Agriculture

10.00 Break

10.15 Workgroup session 3

'Other Gainful Activities'

11.45 Closing/follow-up

Questions and answers

wrapping up

need for PACIOLI 16?

12.00 Lunch (buffet table)

13.00 Bus leaving for the airport/Helsinki centre

Arrival Helsinki-Vantaa Airport 14.30 / Helsinki centre ab. 15.00

2. Finnish agriculture today and a foresight to the future

Jyrki Niemi (MTT Economic Research)



FINNISH AGRICULTURE TODAY AND A FORESIGHT TO THE FUTURE

Jyrki Niemi
MTT Economic Research
jyrki.niemi@mtt.fi

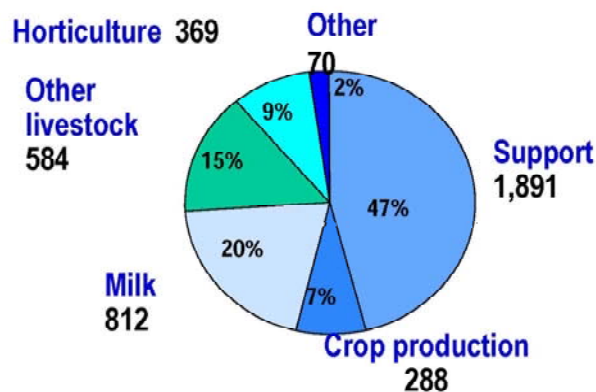
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Structure of the presentation

- (1) Development of EU Finnish agri-food sector during the EU membership from 1995 onwards
 - ⇒ prices, subsidies, income development and structural change
 - ⇒ food markets and foreign trade
- (2) Future challenges of Finnish agri-food sector until 2020

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Total return on Finnish agriculture in 2006, € million



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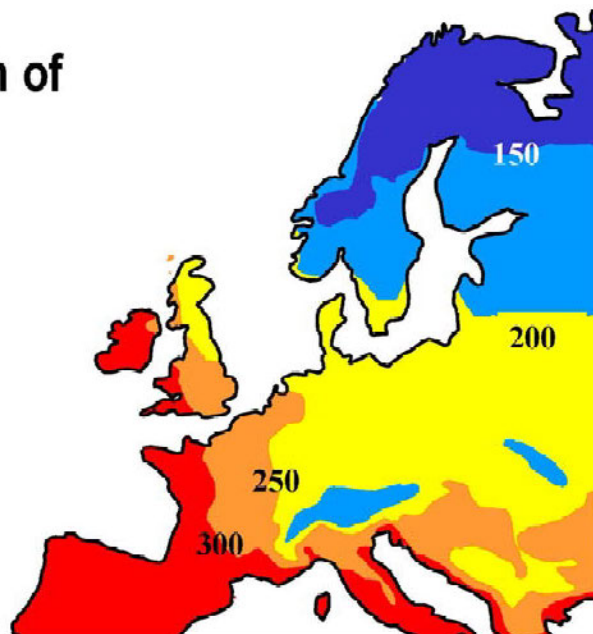
Total € 4,014 million

Finlands's accession to the EU in 1995 ...

- was a serious challenge to Finnish agriculture and food industry
 - ⇒ a challenge for which these sectors were not well prepared
- agricultural markets were almost completely regulated in Finland before joining the EU
- the preconditions of agriculture are much worse in Finland than in Central Europe

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Average length of the growing season, days



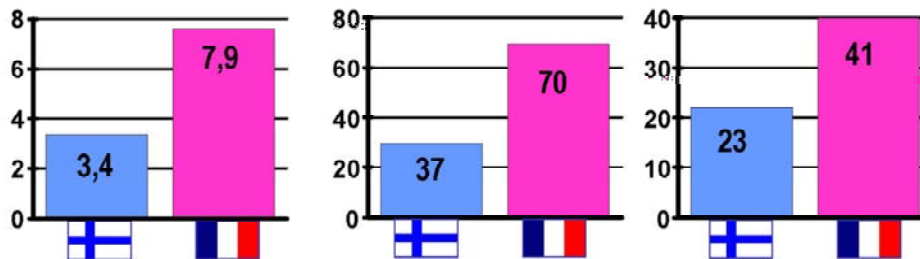
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Yields 2004 Finland - France

Winter wheat,
tonnes / ha

Sugar beet,
tonnes / ha

Potatoes,
tonnes / ha



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In the membership negotiations on agriculture, Finland

- stressed the unique conditions prevailing in the country
- and called on the EU to provide permanent support measures for the farming sector
- *an important objective for Finland was to reach a support package that would guarantee an adequate support scheme for maintaining production in different parts of the country*
- Under the conditions of the Accession Treaty...

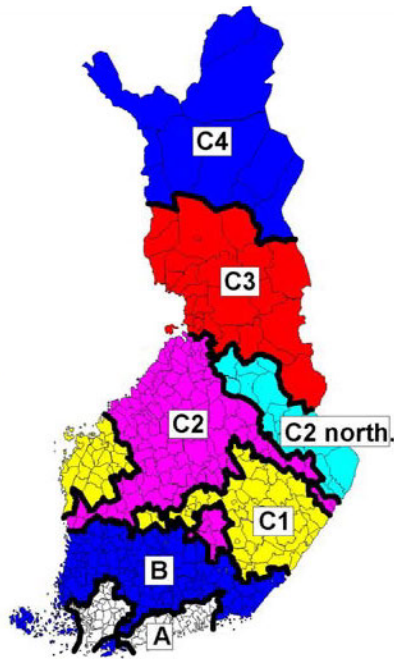
→ *national nordic aid can be paid north of 62nd parallel and adjacent regions*

→ *national aid can also be granted for remaining serious difficulties*

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Support areas

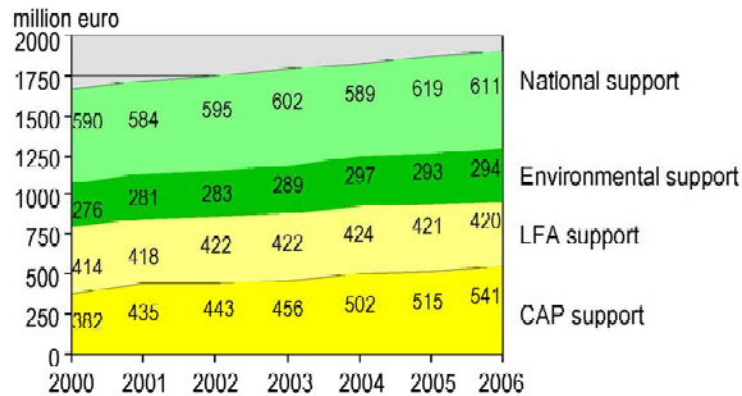
- Nordic aid is paid in support areas C1-C4
- National aid for Southern Finland is paid in areas A and B



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Agricultural support in Finland

- Finland pays about 60% of the support from national funds and about 40% comes from the EU budget



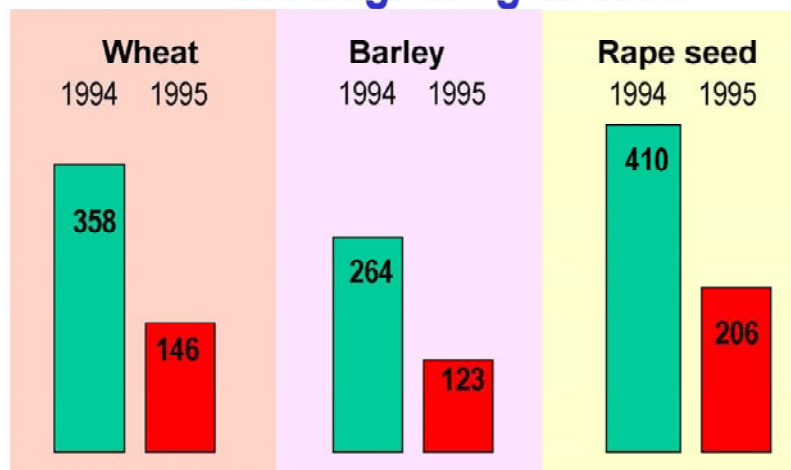
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Market impacts of EU accession on the Finnish agro-food sector

- a rapid shift from closed markets to open and more competitive market, Finland's market share of only 1-2 % of the EU-15
- producer prices dropped by 30 - 60%

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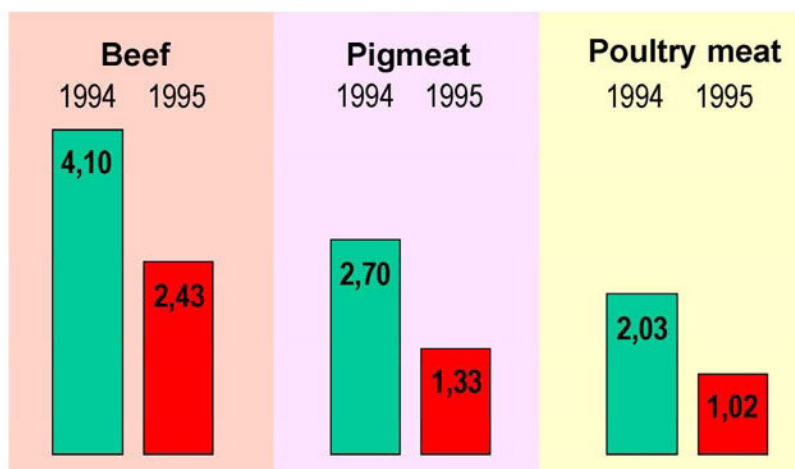
The producer price level of cereals decreased by more than 50% right at the beginning of 1995



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EUR/tonne

Producer prices of livestock products in Finland in 1994 and 1995, EUR/kg



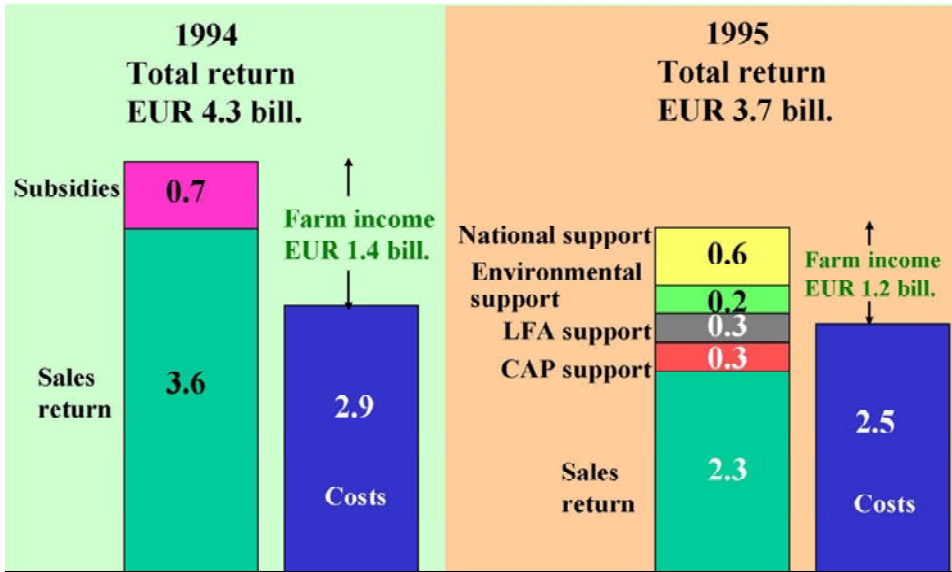
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Impacts of EU accession on the Finnish agro-food sector

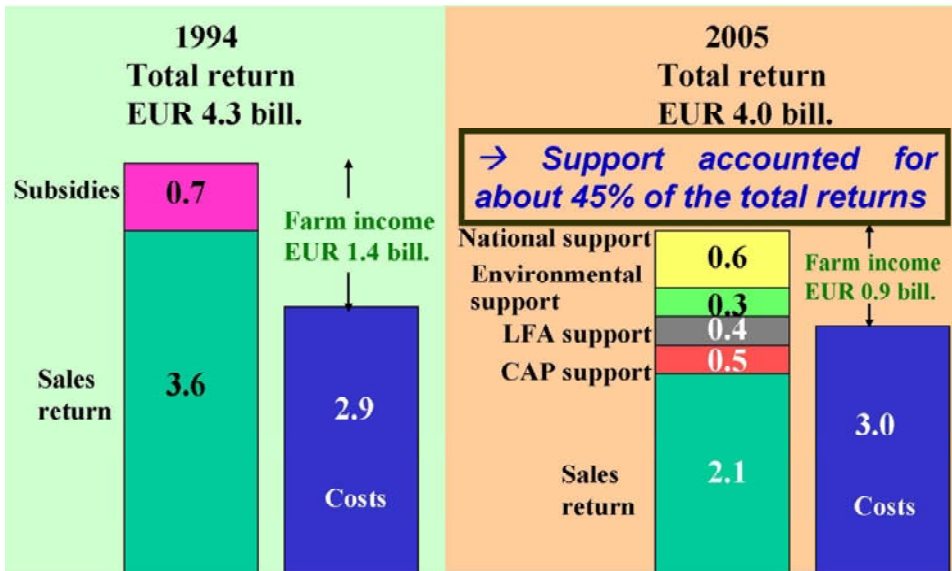
- a rapid shift from closed and regulated markets to open and competitive common market, market share of only 1-2 %
- producer prices dropped by 40 - 60%
 - ⇒ the profitability of agriculture deteriorated
 - ⇒ structural change of income formation (→ *Table*)

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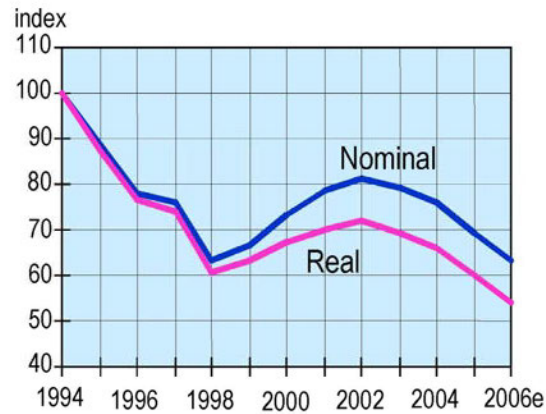
Structural change of income formation in Finnish Agriculture



Structural change of income formation in Finnish Agriculture



Income development in agriculture has been negative...



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...and the structure has changed rapidly

- **the structure of Finnish agriculture has changed considerably in recent decade**
 - ⇒ in 1994 there were still more than 100,000 farms, while now the number is less than 70,000
- **the number of farms has decreased by more than 3% a year, in livestock farming even more**
 - ⇒ for example, the decrease in the number of dairy farms has been about 7%/year

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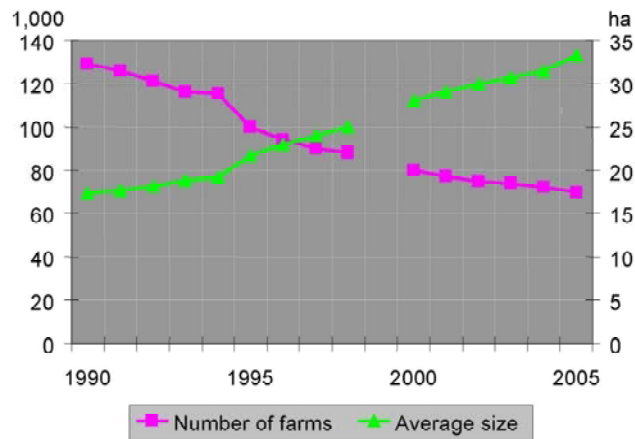
Number of farms in Finland engaged in different production lines in 1994-2006

	1994	1997	2000	2006	Change from 1994
Milk production	35,075	28,677	22,913	15,000	-57%
Beef production	10,630	7,571	5,349	4,240	-60%
Pigmeat production	6,631	5,612	4,316	2,960	-55%
Poultry production	2,576	1,802	1,231	930	-64%
Grain production	34,200	32,000	30,000	28,480	-17%

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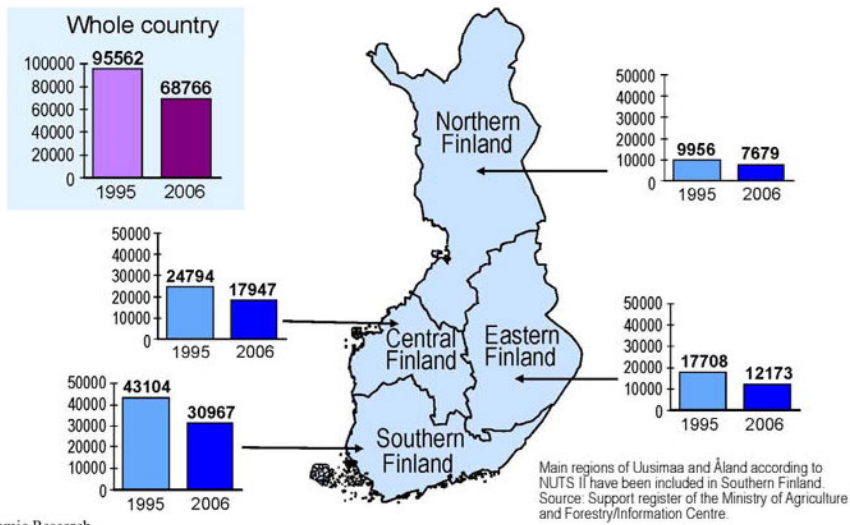
Number of farms and average size (ha) in 1990–2005

■ *the average size of farms has clearly grown as their number has decreased*



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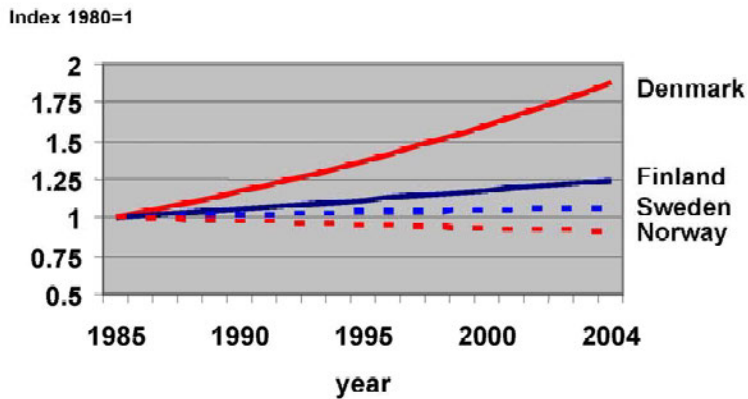
Number of active farms in 1995 and 2006



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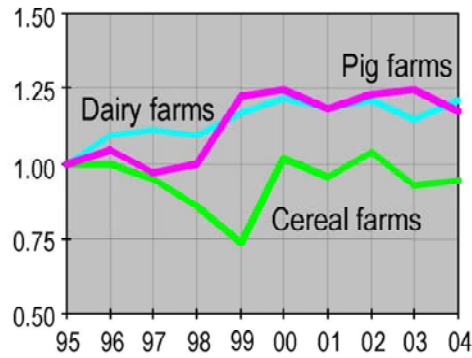
Productivity growth in agriculture?

-the productivity of Finnish agriculture has grown by about 1% a year



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Productivity development in different types of farming in 1995–2004



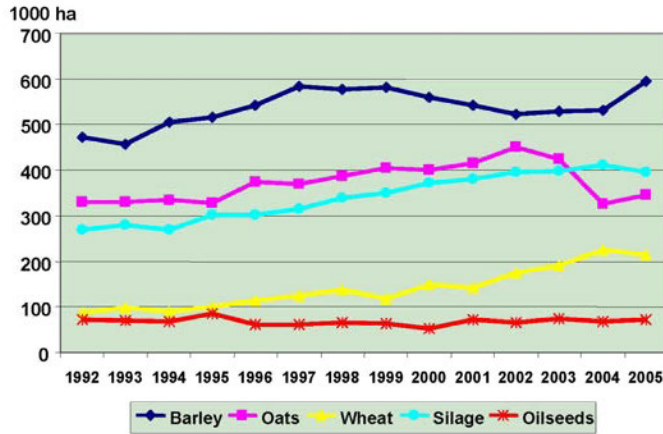
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Development of agricultural production

- **Has the membership in the EU led to significant changes in production volumes?**

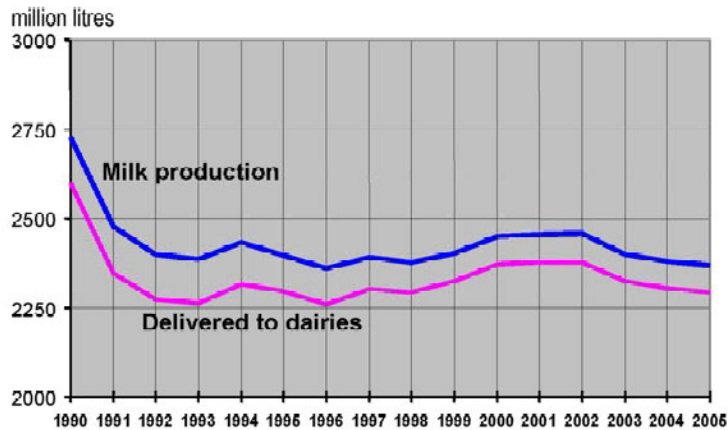
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Harvested areas of main crops in Finland from 1992 to 2005



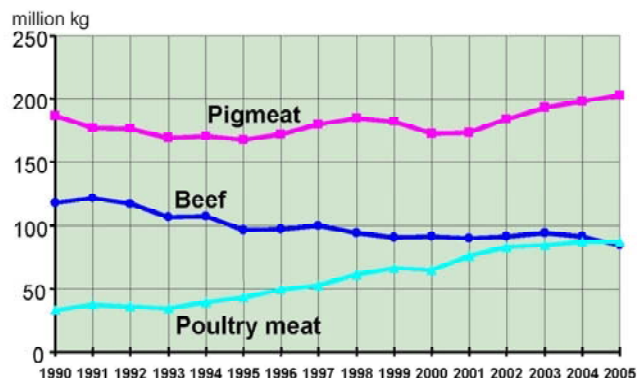
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Production of milk in Finland from 1990 to 2005



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Production of beef, pigmeat and poultry meat in Finland from 1990 to 2005



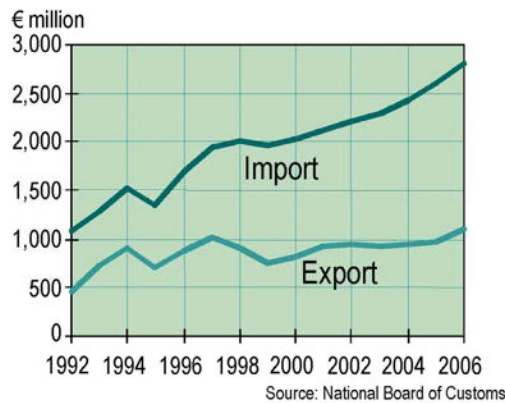
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Consumption and self-sufficiency in agricultural production

	Dairy, liquid			Meat			Bread grain		
	1994	1999	2004	1994	1999	2004	1994	1999	2004
Consumption									
- per capita, kg	207	198	186	56.5	66.1	69.0	60.4	63.1	64.6
- total, million kg	1,027	984	969	288	340	362	300	317	325
Self-sufficiency, %	112	110	109	110	99	105	75	40	110

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Exports and imports of agricultural products (CN 01–24) in 1992–2006, € million



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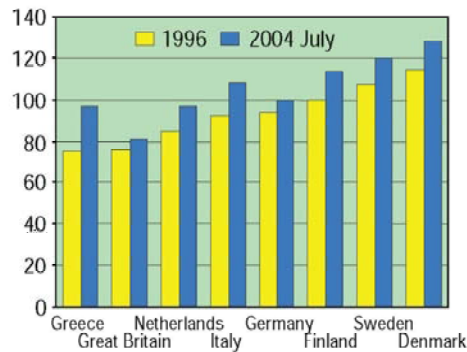
Development of retail market

- food prices fell, on average, by 11% when Finland joined the EU in 1995
- even if the value added tax was raised from 12 to 17 %
- the reduction was caused by the decrease in the producer prices to the EU level
- between 1995 and 2004 the food prices rose in nominal terms by 11 %
- the general consumer price index rose by 13,4 %, which means that the real food prices are below the level in 1995



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Consumer price levels of foodstuffs in certain EU countries in 1996 (Finland=100) and July 2004



Source: Statistik Finland

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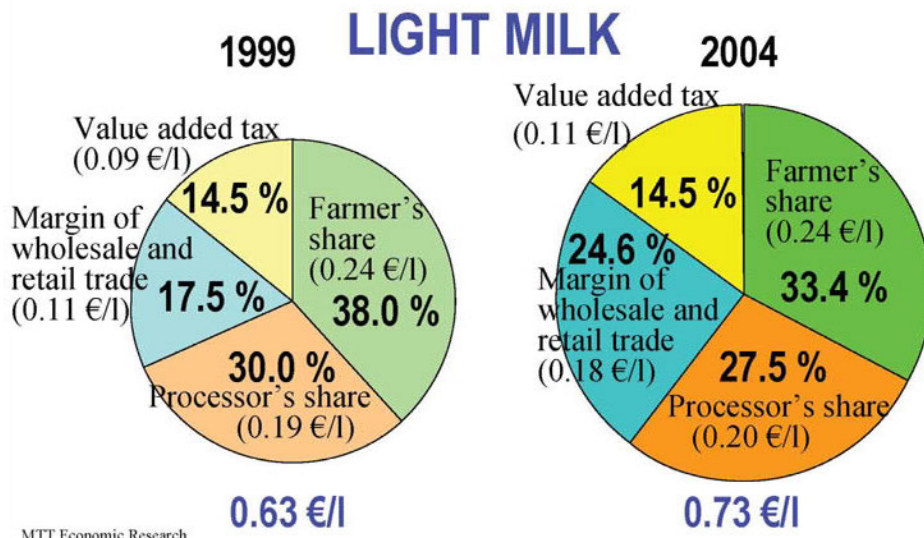
RETAIL-FARM PRICE MARGINS GROWING IN FINLAND



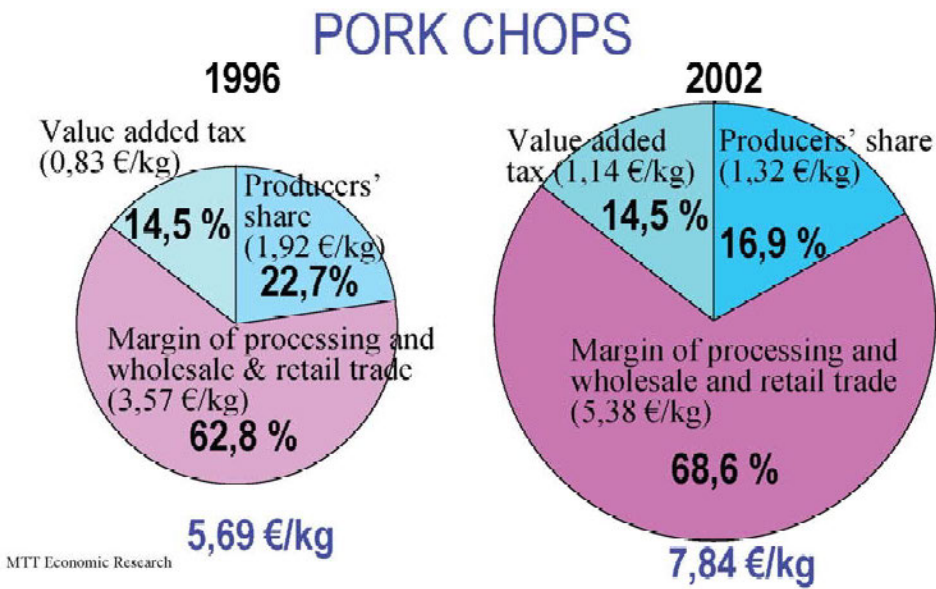
- Farmers have been receiving an increasingly lower proportion of the retail price of food
- The share of the processing sector in the food prices is still the same as before?
- The share of wholesale and retail in the consumer price of food has increased by a few percentage points
 - the EU membership clearly reinforced the position of retail trade in the food supply chain relative to the domestic raw material production and food industry
 - large retailers are able to take advantage of the competition between the domestic food companies and between the domestic companies and foreign ones

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Supply chain margins



Supply chain margins



The future ?

- **agri-food sector is facing a period of re-adjustment to the challenges of the CAP reform and impending agreement in the WTO (cuts in tariffs plus phasing out export subsidies)**
- **the application of the single payment scheme introduced in the context of the CAP reform of 2003 started in Finland in 2006**
 - ⇒ **coupled CAP support will continue to be applied for suckler cows, bulls and ewes**
 - ⇒ **but the CAP support for arable crops is completely decoupled from production**

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Impact of the 2003 CAP reform on Finnish agriculture

- **Decoupling the CAP support for arable crops will cut the area under feed grains by 10-20%**
 - **the domestic feed grain supply would still cover domestic demand**
- **The reform accelerates the structural development of the milk sector**
 - **the incentive to give up milk production increases on small farms**
 - **expansion investments concentrate on ever bigger milk herds**
- **Domestic supply of beef decreases**
 - **reduce the incentives to invest in new establishments**
 - **the beef sector very much dependent on the development of milk production**

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Future images of Finnish agriculture

- liberalising agri-food trade calls for further concentration in the sector
 - ⇒ less than 40,000 farms left in 2020 (less than 6,000 in milk production)
 - ⇒ regional concentration will continue

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NUMBER OF FARMS IN 2020?

	Now 2006	Forecast 2020	Change 2006-2020
Milk production	15 000	5 500	-63%
Beef production	4 240	1 000	-76%
Pigmeat production	2 960	1 000	-66%
Poultry production	930	300	-68%
Grain production	28 480	20 000	-30%
All farms	68 766	35 000	-49%

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Future images of Finnish agriculture

- **liberalising agri-food trade calls for further concentration in the sector**
 - ⇒ **less than 40,000 farms left in 2020 (less than 6,000 in milk production)**
 - ⇒ **regional concentration will continue**
- **in terms labour and regional policy, strong concentration of agriculture is a complicated problem**
- **however, efforts to stop structural development would be costly to the society**
- **the competitiveness of Finnish agriculture calls for the present kind of rapid structural development**
 - ⇒ **the development of technology alone leads to growth in farm size**

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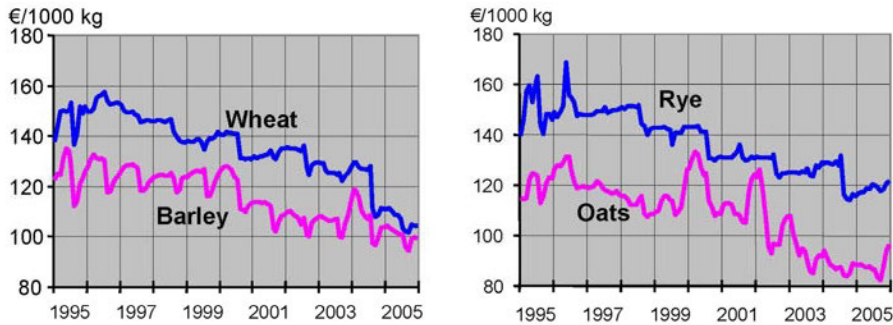


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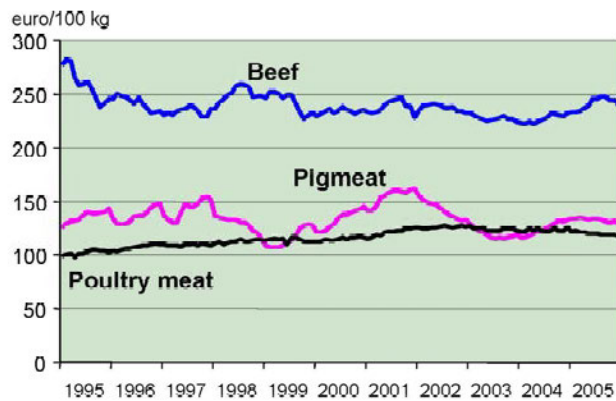
MTT Economic Research

Market prices of cereals in Finland from 1995 to 2005



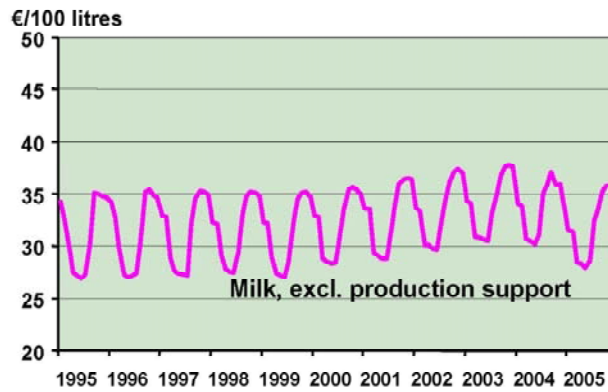
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Producer prices of meats in Finland from 1995 to 2005



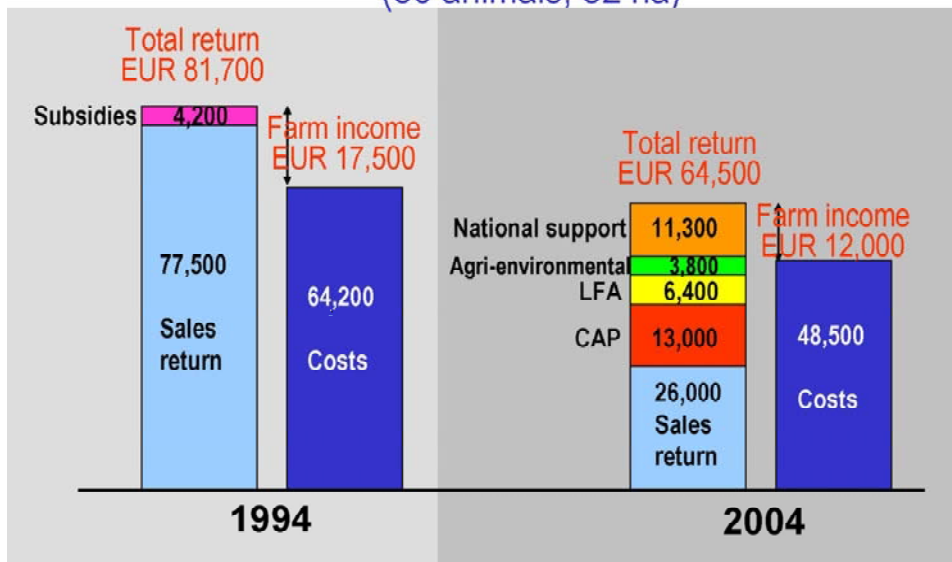
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Produce price of milk in Finland from 1995 to 2005



MTT Economic Research

Structure of income formation in the Finnish farm specialised in beef production (50 animals, 32 ha)



3. Measuring productivity and productivity differentials in Nordic countries - an application on FADN data

Timo Sipiläinen (MTT Economic Research)



Measuring of Productivity and Productivity Differentials in Nordic Countries – an Application on FADN data

Timo Sipiläinen, MTT Economic Research

Pacioli – Aulanko, Finland
10.9.2007

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Outline

- Background
- Methods
- Data
- Results
- Conclusions

Background (1)

- Productivity growth (catch-up) vs. productivity levels
 - Sources of productivity growth / growth differences
 - Sources of productivity differences
- Absolute productivity levels - partial productivity levels mainly
- Relative multi-input – multi-output productivity
 - similar to technical efficiency wrt. a benchmark
- Comparisons suggested by Battese et al. (2004) and O'Donnell et al. (2006)
 - separating technical efficiency and technology differences between groups of firms

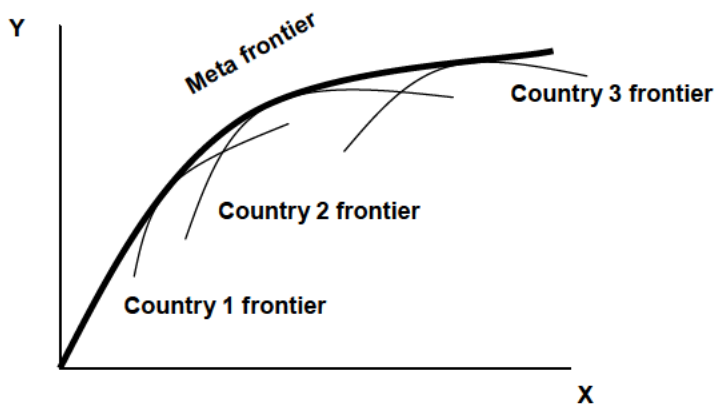


Background (2)

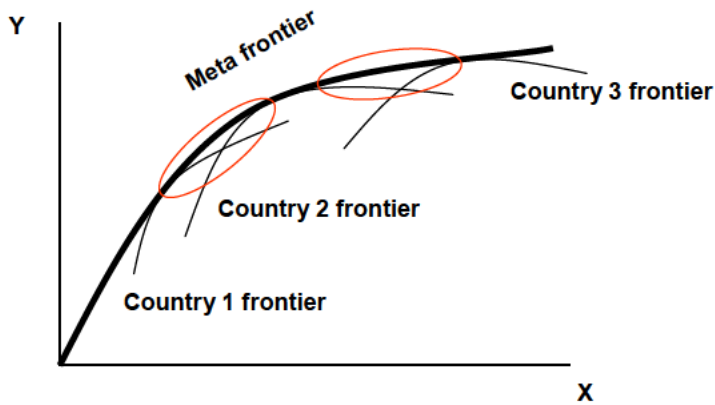
- Hayami and Ruttan's (1971) article about group and meta-production functions
- How to define the joint reference frontier ('meta-frontier') ?
- Usually a concave (smooth or piecewise linear) meta-frontier envelopment of group frontiers is assumed



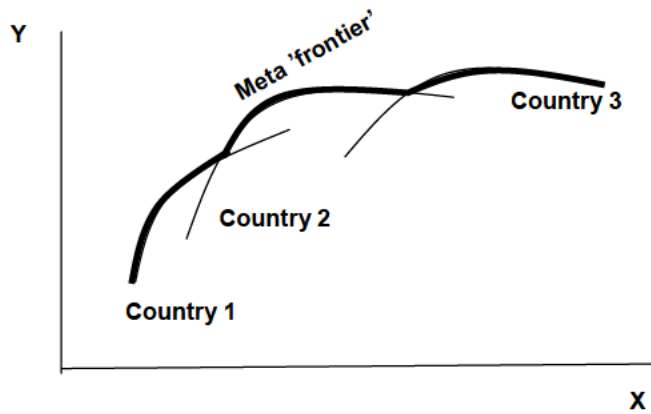
Concave envelopment of group/country frontiers



Concave envelopment of group/country frontiers

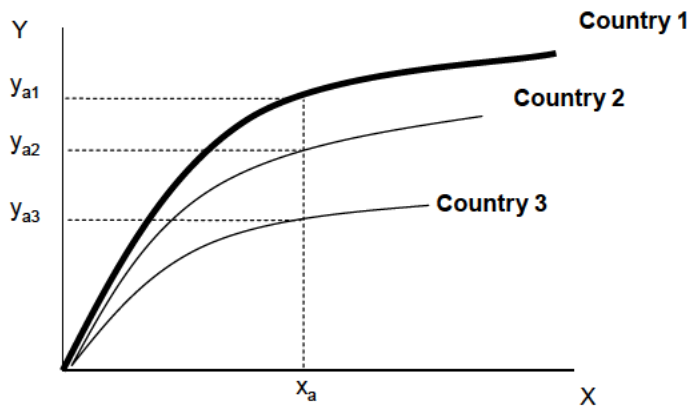


Piecewise concave envelopment





One country dominates



Objective

- To define possible methods to measure productivity differences between groups /countries.
- To compare different approaches of defining the meta-frontier

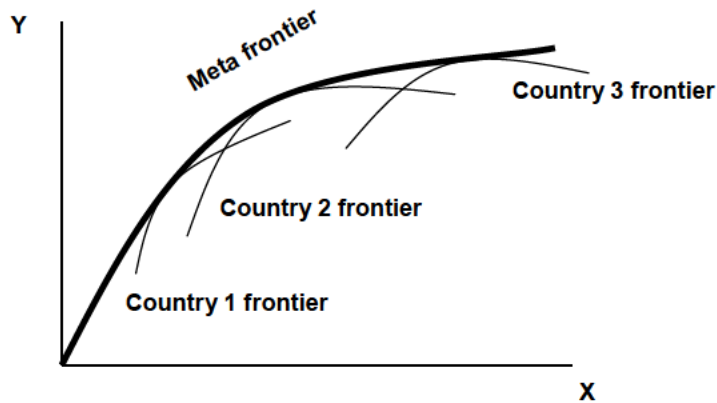
Methods (1)

- Translog (or Cobb-Douglas) production function

$$\ln y = \alpha + \sum \beta \ln x + v - u$$

- Parametric stochastic frontier model (ML, MM)
- Parametric deterministic frontier model (COLS)
- 'Meta-envelopment' achieved by mathematical programming (deterministic)
 - When the function is log linear in parameters

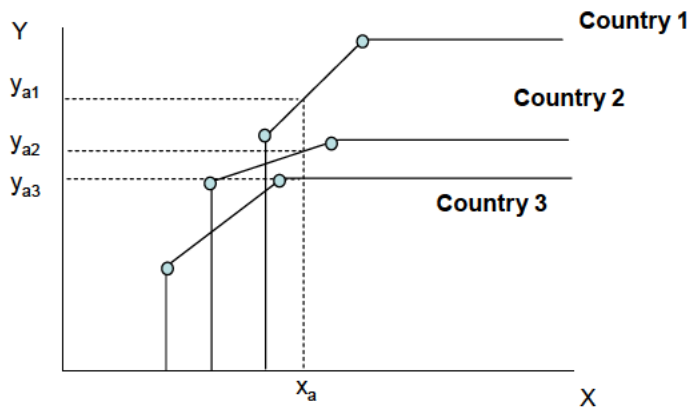
$$\begin{aligned} \min_{\beta} & \sum \beta \\ \text{s.t.} & \mathbf{x}_i' \beta \geq \mathbf{x}_i' \beta_k \end{aligned}$$



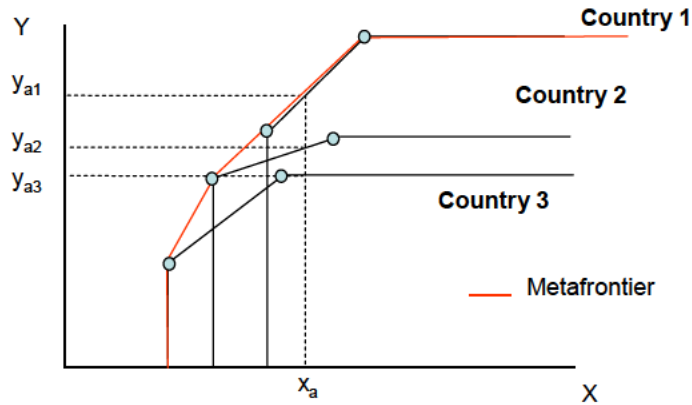
Methods (2)

- DEA based approach
 - Solving country specific and meta-frontier (pooled data) efficiencies
 - Separating technical efficiency and technology differences between countries
 - Deterministic frontier
 - Envelopment and concavity by structure
- DEA easy to implement

DEA – country frontiers



DEA – Meta-frontier



Method 3

- Piecewise linear production function
 - Concave non-parametric least squares CNLS (Kuosmanen 2006)
 - Stochastic frontier (MM)
 - DEA is a deterministic special case
- How to apply
 - CNLS estimation for country frontiers
 - Meta-frontier is solved using ordinary DEA
 - Applied on by expected inefficiency corrected output estimates by country

CNLS

$$\min_{\alpha, \beta} \sum_{i=1}^n \xi_i^2$$

st

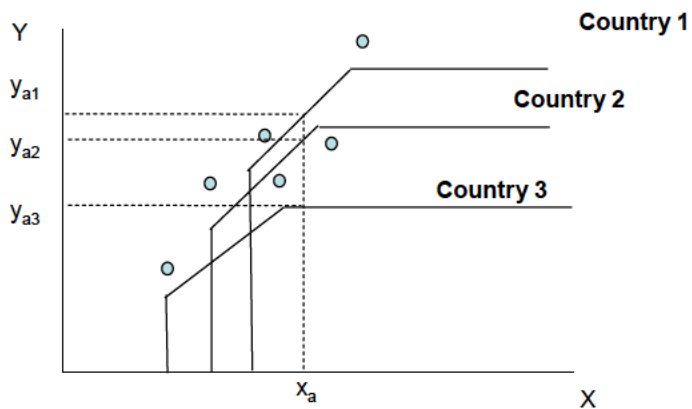
$$y_i = \alpha_i + \beta_i x_i + \xi_i \quad \forall i = 1, \dots, n$$

$$y_i \leq \alpha_i + \beta_i x_i + \xi_i \quad \forall i = 1, \dots, n$$

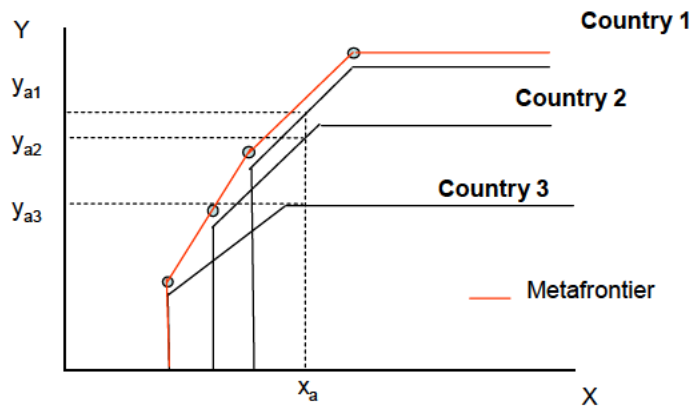
$$\beta_i \geq 0 \quad \forall i = 1, \dots, n$$

- CNLS allows for the intercept and slope coefficients to vary from one firm to another.
- α_i and β_i are unit specific constants and slopes.
- The second constraint imposes concavity and the third monotonicity.
- Inefficiencies derived by method of moments.

CNLS frontiers



Metafrontier



Data

- Cross-sectional FADN data from Denmark, Finland and Sweden in 2003
- 974 dairy farms
- One output – total sales return
- Five inputs – fertiliser, feed, other material, labour, capital
- Descriptive statistics from 1997 to 2003

Descriptive stat / Farm

	Denmark		Finland		Sweden	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Output (€)	265 304	146 442	65 274	35 363	125 023	123 463
Input						
cow (n)	82.7	40.6	21.0	10.2	36.2	32.9
land (ha)	86.0	47.7	40.4	21.1	86.4	81.1
labour (h)	4 313	1 551	5 047	1 561	4464	2 215
purch. feed (€)	58 979	39 207	14 698	11 438	31 335	34 330
fertilizer (€)	5 324	3 692	4 736	3 078	4 508	5 134
capital (€)	46 077	29 257	17 996	14 186	33 785	31 502
material (€)	74 517	39 443	26 892	14 219	42 719	36 796
subsidy (€)	23 055	15 300	20 328	12 512	23 187	25 072

Std Dev refers to the standard deviation.

Results (1)

$$\text{MTE} = \text{CTE} * \text{MTR}$$

Meta-technical efficiency

=

Country technical efficiency

*

Meta-technology ratio



Results (2): Efficiencies (2003)

Determ. envelopment of data (C-D)

	MTE	CTE	MTR
DK	0.767	0.894	0.858
FI	0.625	0.880	0.710
SE	0.622	0.806	0.772

MTE
 =
 CTE
 *
 MTR

Efficiencies (DEA VRS)

	MTE	CTE	MTR
DK	0.810	0.839	0.965
FI	0.668	0.820	0.815
SE	0.748	0.797	0.939

Efficiencies (CNLS)

	MTE	CTE	MTR
DK	0.916	0.922	0.994
FI	0.677	0.900	0.752
SE	0.832	0.861	0.966



Results (3): Relative productivity (2003)

	Concave envelopment			Piecewise envelopm.	
	C-D	DEA(VRS)	CNLS	Aver. PF	Front. PF
DK	1.000	1.000	1.000	1.000	1.000
FI	0.828	0.844	0.757	0.815	0.861
SE	0.900	0.972	0.972	0.944	0.946

Results(4): Danish technology dominates (2003)

Average function

	Largest output %		
	DK	FI	SE
DK	98.08 %	0.27 %	1.65 %
FI	95.72 %	3.95 %	0.33 %
SE	87.58 %	6.54 %	5.88 %

Frontier function

	Largest output %		
	DK	FI	SE
DK	86.26 %	2.75 %	10.99 %
FI	78.95 %	12.83 %	8.22 %
SE	62.75 %	23.86 %	13.40 %

Conclusions

- Slightly different magnitudes of productivity differences by method
- Finnish technology is always the least productive (75 – 85 % of the Danish)
- Danish technology is dominating at most data points



Thank you for your attention
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4. A new farm accountancy data network for Flanders (Belgium)

Dr. Ester Van Broekhoven (Departement Landbouw en Visserij)

Abstract

In this text the new farm accountancy data network (FADN) managed by the ministry of Agriculture and Fisheries of the Flemish government is presented. Besides a brief overview of the complex history of the collection of farm accountancy data in Belgium, the main differences between the new and the former FADN are discussed. Furthermore, the tasks of the FADN team members are described. Particular attention is hereby given to the participant management which is guided by the selection plan as well as to the data warehouse that is being set up to make the FADN data more accessible for data users.

Keywords: farm accountancy data network, regionalization, computerization, participant management.

4.1 Introduction

Belgium used to be a unitary state, but five state reforms (carried out in 1970, 1980, 1988-1989, 1993 and 2001-2003) have transformed Belgium into what it is today: a country that reconciles regional and cultural identities in a federal structure. The unitary Belgium gave birth to a current, more complex structure on three levels: the upper level comprises the federal state, the Communities and the Regions; the middle level is occupied by the Provinces; and the lower level is that of the Communes. Accordingly, Belgium is made up of three Communities (the Flemish Community, the French Community and the German-speaking Community), three Regions (the Flemish Region, the Brussels-Capital Region and the Walloon Region), 10 Provinces (Antwerp, Flemish Brabant, Walloon Brabant, West Flanders, East Flanders, Hainaut, Liège, Limburg, Luxembourg, Namur) and 589 Communes.

At present, decision-making powers are no longer exclusively the competence of the federal government and federal parliament. The country is run by various bodies which discharge their allotted duties autonomously. The federal state remains responsible for managing everything that affects the interest of all Belgians, independently of any linguistic, cultural or territorial considerations: for instance, foreign affairs, national defence, justice, finance, social security and a major share of public health and domestic affairs. It is also the federal state that assumes all the responsibilities that Belgium and its federated entities have vis-à-vis the European Union and NATO. The Communities are competent to deal with matters relating to the people composing them, such as language, culture and

education. The Regions are competent to deal with territorial matters such as town planning, the environment, agriculture and employment.

This text starts, in section 4.2, with an overview of the recent history of the collection of farm accountancy data in Belgium. This section is intended for readers who are familiar with the institutions who used to be responsible for the farm accountancy data collection in the past, but who have not acquainted themselves yet with the current organization of data collection in Belgium. Other readers might skip this section. For them it is sufficient to know that in Belgium farm accountancy data are collected by ministries of the Flemish Region and the Walloon Region and that the *Division of Agricultural Policy Analysis* of the *Department of Agriculture and Fisheries* of the *Flemish government* is nowadays responsible for the Flemish farm accountancy data network (FADN).

Section 4.3 focuses on the main differences between the former and the new Flemish FADN. These differences are related to the field of observation, to the working procedures and to additional data that are being collected through the FADN. Next, in Section 4.4, an overview is given of the tasks of the members of the provincial services and the central service of the Flemish FADN team. Two of these tasks, the participant management and the data warehouse management, are discussed in more detail in Sections 4.5 and 4.6. The text concludes with some reflections on the introduction of the new FADN.

4.2 Recent history of the collection of farm accountancy data in Belgium

In the unitary Belgium, farm accountancy data were collected by employees of a national institution, *Centrum voor Landbouweconomie - Centre d' Economie Agricole* (CLE-CEA, Centre for Agricultural Economics), an institution which is sometimes still referred to by its former name *Landbouweconomisch instituut - Institut Economique Agricole* (LEI-IEA, Institute for Agricultural Economics). Data concerning farms specialized in horticulture and permanent crops were collected by another team and managed in another way, than data of farms not being specialized in horticulture or permanent crops. The majority of the employees of the FADN were agri-accountants, who collected the micro-economical data. A central service of approximately ten persons coordinated the data collection process conducted by the agri-accountants working at the provincial services, one for each province.

Due to the federalisation of Belgium, CLE-CEA became a federal research institution. A Federal Ministry of the Self-employed and Agriculture was created, which, at its creation, had the same responsibilities as the former national ministry. At the state reforms of 1980 and 1988-1989, but especially at the state reform of 1993, some responsibilities concerning agriculture were transferred from the federal state to the regions. In Flanders the Administration of Agriculture and Horticulture (ALT) was founded. In October 2001 the 'Flemish research unit agriculture and horticulture' (VOLT) was founded within ALT. One of the tasks of this new unit was the elaboration of an Agricultural Monitoring Network (LMN) or, in other words, a Flemish FADN.

In 2002, with the state reform of 2001-2003, all agricultural affairs were transferred from the Federal State to the Regions. In Flanders the ALT was extended and a new governmental regional institution was created, the Administration of Management and Quality

of the Agricultural Production (ABKL). The federal research institutions CLE-CEA and the Centre for Agricultural Research (CLO-CRA) were divided. The Dutch-speaking employees of these institutions became employees of the Flemish Region and started working at the *Centrum voor Landbouweconomie* (CLE) and the *Centrum voor Landbouwkundig onderzoek* (CLO) respectively. The Dutch-speaking employees of the provincial and central services of the FADN became employees of the new CLE. CLE and VOLT (ALT) started a joined project to establish a Flemish FADN, based on what remained of the federal FADN.

In 2005-2006 the Flemish governmental institutions were reformed. Activities of the CLE that were not strictly scientific (FADN and macro economics) were transferred from the CLE to the ALT where they joined the employees of VOLT in the new Division of Agricultural Policy Analysis (AMS). The CLO and the part that remained of the CLE formed the new Institute for Agricultural and Fisheries Research (ILVO). Nowadays all Flemish governmental institutions belong to one of the thirteen policy areas (in Dutch: beleidsdomeinen). Examples of policy areas are 'Economy, Science and Innovation', 'Education and Training' and 'Environment, Nature and Energy'. The structure of the Agriculture and Fisheries policy area is shown in Figure 4.1. The four institutions that belong to the policy area are the Department of Agriculture and Fisheries (which roughly corresponds to the former ALT), the Agency for Agriculture and Fisheries (which roughly corresponds to the former ABKL), the ILVO and the Flemish Centre for the Promotion of Agriculture and Fisheries (VLAM). VLAM has its own legal body, while the first three institutions form the Flemish Ministry of Agriculture and Fisheries.

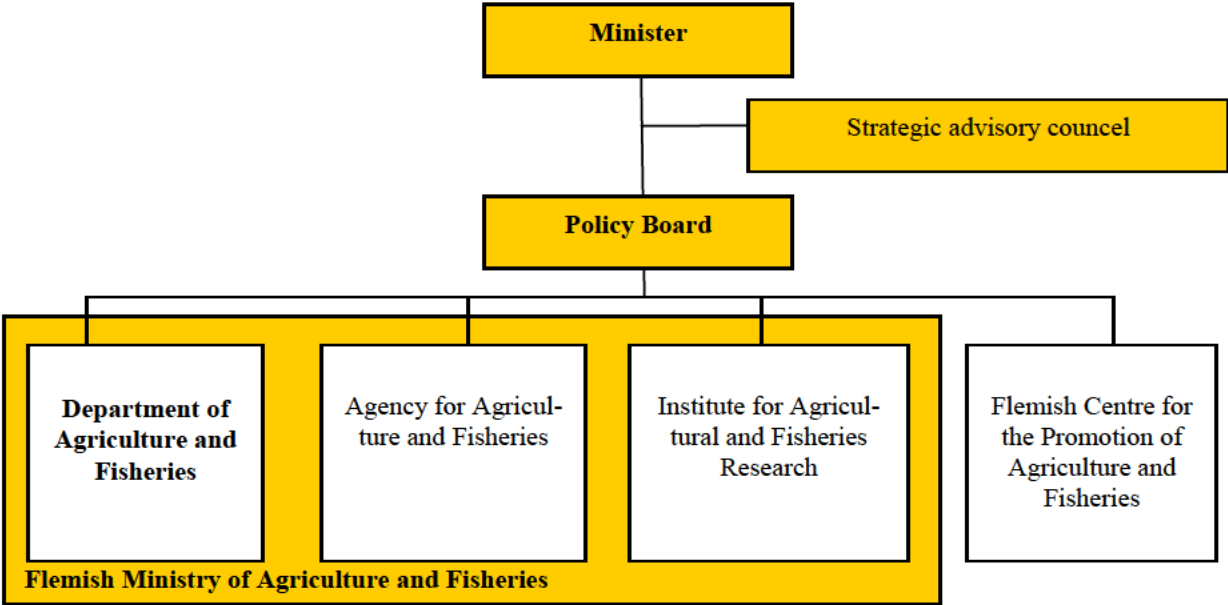


Figure 4.1 Structure of the Agriculture and Fisheries policy area

The primary mission of the Department of Agriculture and Fisheries is to provide policy support and conceptual input. As shown in figure 4.2 the department consists of

- the Agriculture and Fisheries Policy Division;
- the Division for Agricultural Policy Analysis;
- the Sustainable Agricultural Development Division; and
- the Management Support Services which provide support regarding staff and organizational development, finances and the budget, communications and logistics and regarding horizontally organised legal services.

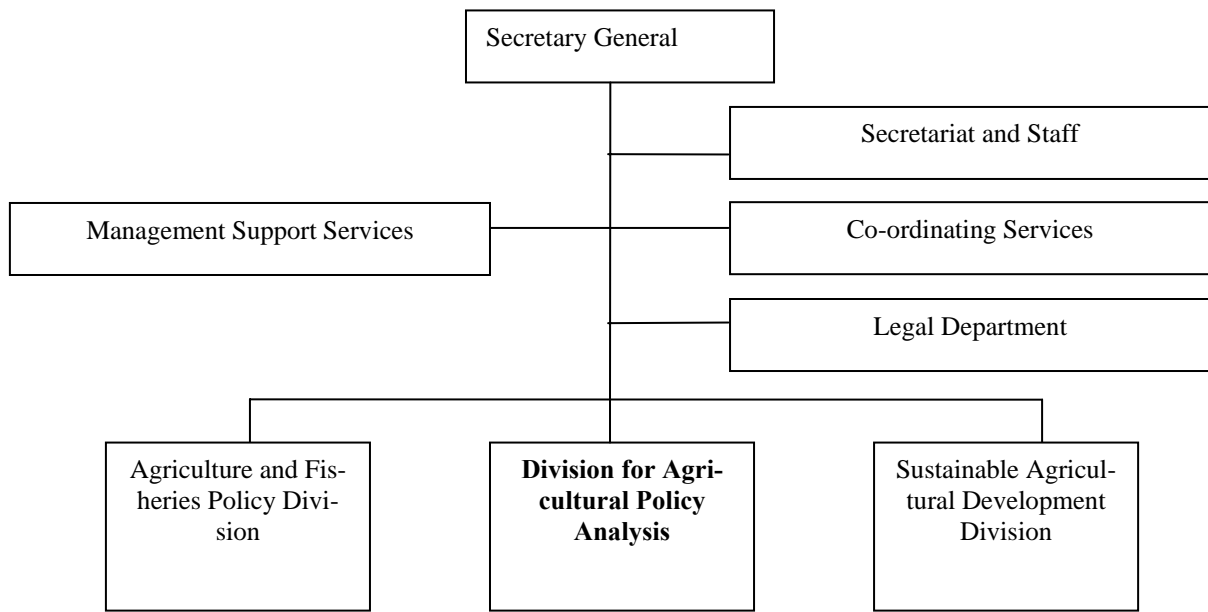


Figure 4.2 Structure of the Department of Agriculture and Fisheries

The Division for Agricultural Policy Analysis:

- collects economical, sociological and environmental data concerning farms in Flanders through the Flemish farm accountancy data network (FADN);
- coordinates the data collection and integration for the policy area;
- reports on the situation and the evolutions in agriculture and horticulture in Flanders;
- analyses current and (potential) future policy measures; and
- follows new scientific evolutions or techniques that might be valuable for the policy area.

4.3 Differences between the current Flemish FADN and the former Belgian FADN

Few people currently working at the central service of the Flemish FADN, used to work at the central service of the former Belgian FADN. With the regionalisation of the FADN, crucial experience was lost in the Flemish Region as certain key tasks used to be carried out by French-speaking employees of the CLE-CEA who became employees of the Wal-

loon Region. Furthermore, the applied data collection and management procedures were outdated. Detailed data were written down in paper cashbooks and only aggregated values, which the accountants needed to calculate themselves, were introduced in data files by means of DOS modules. The purpose of the project 'Agricultural Monitoring Network', that started in October 2002, was thus not only to adapt the FADN to the reduced field of observation, but also to computerize and modernize the data input and data management procedures.

Firstly, it was opted to continue to do the data collection ourselves. The strength of the existing system, where our employees collect data, is the close contacts with the farmers which create a basis of trust. Secondly, a commercially available software package was selected as data input tool. The software was adapted to the specific needs of the FADN. The software creates a local data base per holding, which then needs to be centralized. Software to transfer data of the individual farms to a central data base and to manage this central data base was developed by the company which was the IT outsourcer of the Flemish government at that time. Furthermore, new methodologies, adjusted to the new field of observation, were developed for the sampling plan and the weighting system of the results. Remark that with the introduction of the new agricultural accountancy software, the horticultural and agricultural data networks of the former FADN were united in one FADN, using the same software. Data of all farms are now processed in a uniform way.

The agricultural accountancy software not only incorporates modules for the input of the micro-economical data that used to be collected in the former Belgian FADN, but also for the input of additional information, for instance concerning environmental topics. The software can aggregate data of an individual farm and generate an overview of both the most important revenue and cost entries of the entire farm and the different crops and livestock items present on the farm. In the former FADN only an overview of the most important revenue and cost entries of the entire farm could be generated. The additional overviews for the individual crops and livestock items are highly appreciated by the farmers of the accountancy network. The accounting year 2004 (from 01/01/2004 to 31/12/2004) was the first accounting year for which data were inserted using the new data input tool. The accountants, i.e. the employees working at the provincial services, started with the input of the data concerning the accounting year 2004 in April 2005. Since its introduction, an enhanced version of the software has been released every six months. Up to now the enhancements were mainly adjustments of erroneous programming code, adaptations of user-unfriendly input screens and extra functionalities increasing the efficiency and facilitating data quality control. However, the main enhancement of the next new version will be a module which allows the automatic input of electronic invoices of vegetable and fruit auction halls. Most Flemish auction halls are cooperatives of farmers, where the members are obliged to sell all their vegetables and fruit through the auction hall of the cooperative. In the accounting year 2006, 270 farms in the FADN produced vegetables and/or fruit. The 172 participants who gave the permission to the FADN to obtain their electronic invoices directly from the auction hall sell their vegetables and fruit at 13 different auction halls. The version of the agricultural accountancy software that will be released in November 2007 will allow for the automatic introduction of electronic invoices of one auction hall, representing approximately 50 farms in the FADN and the implementation of the automatic introduction of electronic invoices of other auction halls will soon follow. As

the demand for data concerning other gainful activities (for instance farm tourism) is rising in Flanders, it is currently investigated how revenues and costs of other gainful activities can be introduced in the agricultural accountancy software.

The agricultural accountancy software inserts all data (of different accounting years) of a farm in the individual data base of the farm on the pc of the accountant. From time to time, the accountant uploads the data base to a central data base stored on an Oracle Server. In November 2006 a data warehouse project was started, to create data marts which can be consulted by employees of the division who are not familiar with consulting relational data bases. The data warehouse project is discussed in more detail in Section 6.

4.4 Data flows in the FADN

The data exchanges between the four main groups involved in the FADN are represented in figure 4.3. Hereafter, a more thorough explanation follows.

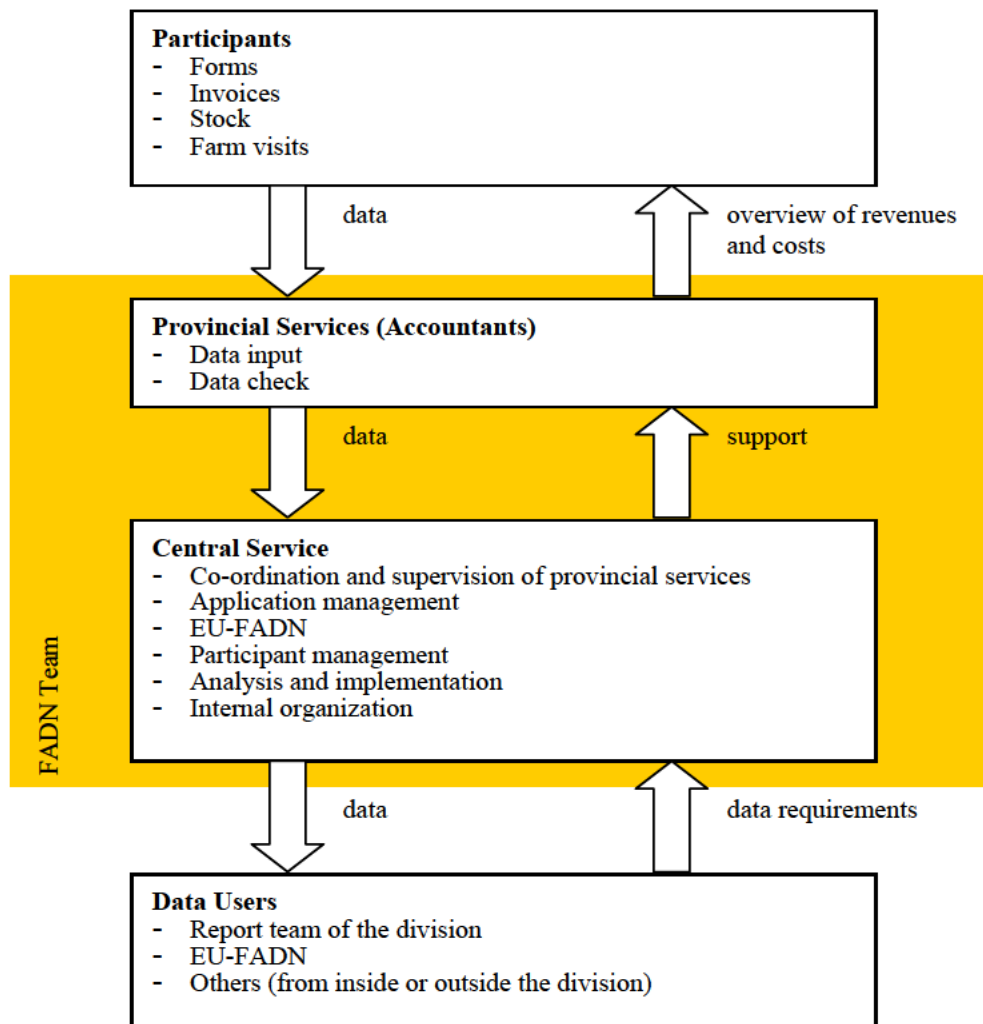


Figure 4.3 Data flows in the FADN

4.4.1 Provincial Services

The primary data source is the participants, i.e. the farms. For the accounting year 2006 the FADN comprised 721 farms. Each participant is in close contact with its accountant. The data concerning the accounting year 2006 were processed by 31 accountants representing 25 full-time equivalents (fte) and five clerks representing three fte. Some farms have been participating to the FADN for more than fifteen years. As the participant is revealing confidential data concerning her/his business it is important that the participant trusts the accountant. Therefore it is important that a same accountant is responsible for a certain farm for as long a period as possible.

At the start of an accounting year, in January or February, the accountant visits all participants (s)he is responsible for to make an inventory of all fuels, herbicides, pesticides, fungicides, fertilizers, fodder, silage et cetera. The participant receives specially designed forms to make it more straightforward for him/her to record all revenues and costs, crops and livestock items present on the farm, allotments and the corresponding cultivation schemes and changes in livestock due to purchases, sales, calving and death. Participants that are new to the FADN receive additional support of their accountant to complete the forms. The participants in turn supply the accountants with detailed invoices of revenues and costs. Once an accountant received a certain amount of information from the participant (s)he starts introducing the data using the agricultural accountancy software. An accountant can always consult the FAQ list maintained by the central service or contact the central service if (s)he encounters problems with the input. The accountant contacts the farmers if (s)he is confronted with inconsistencies or incompletenesses. If necessary, the accountant visits the farm in order to collect additional information. Once all data are inserted and checked, the accountant has to upload the individual data base of the farm to the central data base. If the data of a farm pass the quality check and are approved by the central service, the accountant can generate an overview of the most important revenue and cost entries of the entire farm and the crops and livestock items present on the farm with the agricultural accountancy software. The accountant will pay the farmer a visit to discuss this individual report. At this occasion the accountant can also discuss other reports made by the division with the farmer.

4.4.2 Central Service

The central service co-ordinates and supervises the five provincial services. This encompasses:

- the assignment of participants to the different accountants at each accounting year;
- drawing up an individual planning for each accountant for each accounting year;
- designing the forms supplied by the accountant to the participant;
- updating the instructions concerning the data input;
- supporting the accountants regarding the input in the agricultural accountancy software;
- organizing meetings between the central service and the provincial services;
- taking care of data checks and quality management;
- monitoring the progress of the data input; and

- supporting the provincial services regarding staff and organization development and logistics.

Furthermore, the central service takes care of the application management. Members of the central service inform the developer of the data input tool on the changes that should be made to the software. These changes could be adjustments or extensions in order to be able to meet additional data requirements. New releases of the agricultural accountancy software are tested by the central service. The central service is also responsible for the management of the central data base. The accountants can contact the central service for all ICT related topics such as the installation of a new release of the data input tool.

Also, it is the task of the Central Service to report to the FADN of the European Union (EU-FADN). More in particular this involves:

- determining a selection plan once a year;
- determining the standard gross margins (SGM) of all crop and livestock items;
- updating the procedure assigning a farm type to the farms in the Flemish FADN;
- making EU-FADN files; and
- taking care of the communication between EU-FADN and the Regions as well as the organization of the yearly meetings between the Regions regarding topics related to EU-FADN (alternatively by the Flemish and Walloon Region).

Underrepresentation of farm types and dimensions in the sample according to the selection plan is palliated with recruitment of new participants. The participant management is discussed in more detail in Section 4.5.

The group of tasks referred to as 'Analysis and implementation' in figure 4.3 contains a wide range of tasks such as

- analysing the data requirements of the data users;
- keeping an eye on developments in the agricultural sector that might affect the FADN;
- updating the methodologies of the selection plan, weighting system and farm typology determination;
- determining the content and layout of the individual overviews of the revenue and cost entries generated by the agricultural accountancy software;
- analysing the macro-economical data of sources external to the division that are used in the weighting system;
- carrying out calculations to answer specific questions of data users;
- making the data in the central data base accessible through a data warehouse; and
- generate standard reports on the profitability and technical-economical variables of Flemish farms.

The last group of tasks is related to the organization of the central service such as logistics, internal meetings and discussions.

Currently four Masters of Science in Engineering (1 fte as head of the FADN team, 0.5 fte for application management, 1 fte for EU-FADN and 0.8 fte for analysis and implementation), one Master in Engineering (1 fte for coordination and supervision of the provincial services, EU-FADN and participant management) and three Bachelors (0.6 fte

for support regarding the input in the agricultural accountancy software, 0.4 fte for application management and 1.4 fte for analysis and implementation). Reporting tasks and tasks related to the data warehouse mentioned in the list of 'analysis and implementation' tasks are mainly carried out by members (corresponding to 3 fte) of the reporting team of the division.

The data of the Flemish FADN are supplied to the FADN of the European Union, to the members of the study team of the division and to data users within the Ministry, Flemish government, research institutions (ILVO) and universities.

4.5 Selection plan and actual sample

One of the main tasks of the Division for Agricultural Policy Analysis is reporting on the situation of commercial farms in Flanders. Therefore, the field of observation of the Flemish FADN consists of the commercial farms in Flanders. The participants of the FADN should run a farm which is large enough to provide work for one full-time equivalent (fte), which corresponds to four Flemish Size Units (VGE). For Standard Gross Margins calculated with data from 2000 to 2004, four VGE correspond to 19.2 ESU (European Size Units). Furthermore the field of observation is limited to farms which correspond to less than 100 Flemish Size Units (= 479.6 ESU for SGM_2000_2004) as larger farms are rare in Flanders and the accidentally inclusion of such a large farm would distort the average values.

The Directorate-general Statistics Belgium of the Federal Public Service Economy carries out a yearly agricultural census. The inquired businesses are farms selling some or all of their produced crops and livestock items, agricultural contractors, and institutions that do not sell any of its agricultural production but cultivate more than one are. In 2006 there were 33,224 farms in the Flemish Region with a total economic size of 468,765 VGE. In 2006, 20,708 farms had a corresponding economic size larger than or equal to 4 VGE and smaller than 100 VGE. These farms represent a total economic size of 415,842 VGE or 88.7% of the total economic size of all farms in Flanders. Farms being too small (respectively too large) to be included in the field of observation represent 3.6% (respectively 7.7%) of the total economic size of all farms in Flanders.

Since it is not compulsory for the majority of the Flemish farms to keep an account and since the participation of farmers to the FADN is on a voluntary basis, it is impossible to take a random sample from the population. Accountants spend more time to collect data from a new participant than from a farm that has already been participating for several years. For, after some years the participant familiarizes with the forms and procedures of the FADN while the accountant familiarizes with the structure and particularities of the farm. The Flemish FADN has approximately 720 participants. Every year approximately 40 participants leave the FADN due to several reasons. A first group of participants that leave the FADN are participants that retire and whose successor (if at all there is a successor) is not interested to join the FADN. Participants that, due to their age, do not longer have the intention to invest money in their business form a second group of leavers. They are not longer interested in the yearly overview of the revenues and costs at their farm which might reveal weaknesses of and opportunities for the farm management. A last

group leaves the FADN for a private accountancy firm. The existence of this last group indicates that the FADN had important shortcomings. A first shortcoming was the large time difference between the actual end of an accounting year and the moment that the accountant paid the farm a visit to discuss the overview of the most important revenue and cost entries of the entire farm and the crops and livestock items present on the farm. The introduction of the agricultural accountancy software along with the new working procedures has led to serious arrears. However, also due to this computerization, the accountants are catching up. The processing of the data of the accounting year 2007 is foreseen to be back on schedule.

Private accountancy firms offer services regarding technical-economical accounts as well as fiscal accounts, whereas the FADN only keeps technical-economical accounts, which might be considered as a second shortcoming. As the FADN does not have resources (yet) to keep fiscal accounts, the FADN can only compensate for not offering services regarding fiscal accounts by continuing offering services regarding technical-economical accounts free of charge and by giving the participant valuable information in return for his/her cooperation. Accountants are brainstorming in working groups how the overview of revenue and cost entries could be enhanced. In April 2008 a report should be ready for each of the participants, listing the important revenue and cost entries and technical indicators of each crop and live stock item present on his/her own farm as well as values of the same variables obtained at similar (anonymous) farms in the FADN.

The participants that leave the FADN are replaced by other farms. The applicants who are interested to join the FADN are accepted if the sampling plan points out that there is no overrepresentation of farms of the farm type and the economic size of the applicant. If farms of the farm type and the economic size of the applicant are already abundantly available in the FADN, the applicant will not be included in the FADN.

Every year the sampling plan is updated. The Belgian FADN has been set up in order to be able to report on the profitability of the agricultural sector and to compare the evolution of its profitability with that of other economical sectors. Up to now, this aim still plays a central role in the methodology of the sampling plan for the Flemish Region. When updating the selection plan of the Flemish FADN, which is done for each accounting year, the total sample size is considered to be fixed. In the selection plan for the accounting year 2008 for instance the total number of participants is 720, which is the number of accounts that has to be provided to the EU-FADN by the Flemish Region.

The variable that has been selected as a measure for the profitability of the farms is the earned income per full-time equivalent. The sample should allow for an as accurate an estimation of the earned income per fte as possible. The earned income per fte at the farms varies a lot, even among farms of a same farm type. Furthermore, there exists a great difference in income between farms of different economic sizes. Three classes of economic size are defined: class D1 contains all farms of an economic size belonging to the interval [4 VGE, 15 VGE], class D2 those belonging to the interval [15 VGE, 26 VGE] and class D3 those belonging to the interval [26 VGE, 100 VGE]. The variability of the income of farms belonging to a same farm type and economic size class is lower than the income variability of all farms. Co-workers of the FADN of the Netherlands showed on data of the Dutch FADN that adding a third stratification variable does not significantly reduce the

variability of the income within the classes (Poppe, 2003). Therefore, only farm type and economic size class are used as stratification variables.

As sampling technique it is opted for disproportional stratified sampling. For less occurring farm types the number of farms to be included in the sample is set to such a value that the ratio of the number of farms in the sample to the sample size is equal to the ratio of the total economic size of the farms of the considered farm type to the total economic size of all farms in the field of observation. The total number for the three farm types '2010 & 2030', '2020' and '3210 & 3400' is also set to such a value that the ratio of the number of farms in the sample to the sample size is equal to the ratio of the total economic size of the farms of the three farm types to the total economic size of all farms in the field of observation. The total number for the remaining farm types is set to 720 reduced by the number of farms assigned to the farm types mentioned above. In a next step, the numbers of farms assigned to each less occurring farm type; the three farm types '2010 & 2030', '2020' and '3210 & 3400' and; all other farm types are assigned to the different strata within each of these group of farm types. The number of farms assigned to a stratum is relative to the variability of the earned income per fte within the stratum: the greater the variability within a stratum is the larger is the number of farms to be included in the sample. This procedure has the advantage that a same relative error is obtained for the estimated earned income per fte for the different strata, while there are still sufficient farms of less occurring farm types included in the sample.

The total economic size of all farms of a certain farm type in the field of observation is determined using data of the Directorate-general Statistics Belgium of the Federal Public Service Economy. For the selection plan of the accounting year 2008, the most recent data available in July 2007 were used, i.e. data of 2006. The variability of the earned income per fte within strata is derived from data of the Flemish FADN. For the selection plan of the accounting year 2008, data of the accounting years 2003, 2004 and 2005 were used.

In table 4.1 the farm types of the community typology present in Flanders are listed. In table 4.2 the actual sample for the accounting year 2005 and the sampling plan for the accounting year 2008 are shown together with a comparison of the actual sample and the sampling plan in order to see over- and underrepresentation of farms in the different strata. The columns *DIM 0* and *DIM 4* show the number of farms in the actual sample with an economic size smaller than 4 VGE respectively equal to or greater than 100 VGE. There is a difference between the number of farms per strata in the actual sample for the accounting year 2005 and the number of farms that should be sampled per strata for the accounting year 2008. Some strata are currently under- respectively overrepresented in the sample. In the lowest part of table 4.2 a value of more than 100% indicates overrepresentation and a value of less than 100% indicates underrepresentation.

The variability of the earned income per fte of farms in the Flemish FADN belonging to the farm type '4200 & 4400' and '8200' varies a lot over the years due to the heterogeneity of these farm types. According to the sampling plan for the accounting year 2007, 73 farms were required for the farm type '4200 & 4400' and 64 for the farm type '8200'. The number of farms of the farm type '4200 & 4400' should therefore increase in the sample, but not to such a large extent as indicated in the sampling plan for the accounting year 2008. It should also be tried to include more farms of the farm type '8130 & 8140' and '5000' in the sample. According to the sampling plan the farm type '5000' is not the farm

type in highest need of additional farms, but as the farms belonging to the farm type '5000' represent 15.5% of the total economic size of all farms in the field of observation a higher representation of these farms in the sample is preferable. A lot of farms specialized in pig rearing, and in particular pig fattening or poultry-meat are no independent businesses anymore where the farmer, as head of the business, decides how the farm is managed. More and more of these farms join an association including farms, a fodder company and an abattoir where the farmer is under contract to the association. As in these cases administrative tasks are not longer carried out at the farm itself, it is hard to find a farm of farm type '5000' where an account is kept at the farm.

Furthermore, no additional farms of the farm type '4110' are needed in the sample. The sampling plan also seems to indicate that farm specialized in horticulture and permanent crops, in particular the farm types '2010 & 2030' and '3210 & 3400', are overrepresented in the sample. When reporting on the profitability of these Flemish farms, however, a more detailed subtypology is applied. Following subtypes of farms are distinguished: specialist mushrooms, specialist strawberries, specialist market garden vegetables and cropping - under glass, other market garden vegetables and cropping - under glass, specialist market garden vegetables and cropping - outdoor, specialist ornamentals - under glass, specialist azalea, specialist begonia, specialist cut flower, other specialist flowers and ornamentals, tree nursery and specialist fruit. Therefore, in order to analyze the profitability of these different farm subtypes, more farms are needed than in order to analyze the profitability of all farms belonging to the farm types '2010 & 2030', '2020' and '3210 & 3400' defined by the European Union. As the sector of horticulture and permanent crops in Flanders has changed a lot recently, the (Flemish) horticultural typology should be revised. This revision will be done after the introduction of a new community typology based on Standard Outputs instead of on Standard Gross Margins.

Finally, table 4.2 shows that in general farms of the economic size class DIM 1 are underrepresented in the sample.

4.6 Making the data easily accessible for the data users

The central data base to which the accountants upload the individual file of each farm is a relational data base consisting of 91 tables. As it is not straightforward to consult this data base it was decided in November 2006 to set up a data warehouse to make the FADN data easily accessible for the data users. The Division of Agricultural Policy Analysis opted for one single tool, commercially available software, for all tasks related to data warehousing, analysis and reporting.

In order to obtain a data warehouse which allows for the generation of standard reports as well as for the execution of ad hoc analyses, data should pass through different stages. The first stage is the whole of internal and external data sources, the intermediate stage is referred to as the ETL stage and the last stage is the data warehouse. In the first stage it is investigated which are the formats and content of the different data fields, which are relevant data fields and how the values in data fields which are derived from other data fields were obtained. For each data field that will be used to generate a data mart, the information concerning its content and format is stored in a metadata file. In the ETL stage,

short for extraction, transformation and loading, different data sources are combined, redundant data fields and records are removed, data quality checks are carried out, data are transformed and the validated and transformed data are loaded into a new table. In the last stage the structure of the data warehouse is defined.

Table 4.1 Farm types present in Flanders

Code	Farm type
1000	Specialist field crops
2010	Specialist horticulture --- specialist market garden vegetables
2020	Specialist horticulture --- specialist flowers and ornamentals
2030	Specialist horticulture --- general market garden cropping
3210	Specialist permanent crops --- specialist fruit and citrus fruit --- specialist fruit (other than citrus)
3400	Specialist permanent crops --- various permanent crops combined
4110	Specialist grazing livestock --- specialist dairying ---milk
4120	Specialist grazing livestock --- specialist dairying ---milk & cattle rearing
4200	Specialist grazing livestock --- specialist cattle-rearing and fattening
4300	Specialist grazing livestock --- cattle-dairying, rearing and fattening combined
4400	Specialist grazing livestock --- sheep, goats and other grazing livestock
5010	Specialist granivores --- specialist pigs
5020	Specialist granivores --- specialist poultry
5030	Specialist granivores --- various granivores combined
6000	Mixed cropping
7100	Mixed livestock --- mixed livestock, mainly grazing livestock
7200	Mixed livestock --- mixed livestock, mainly granivores
8110	Mixed crops-livestock --- field crops-grazing livestock combined --- field crops & dairying
8120	Mixed crops-livestock --- field crops-grazing livestock combined --- dairying & field crops
8130	Mixed crops-livestock --- field crops-grazing livestock combined --- field crops & non-dairy grazing
8140	Mixed crops-livestock --- field crops-grazing livestock combined --- non-dairy grazing & field crops
8200	Mixed crops-livestock --- various crops and livestock

Table 4.2 Actual sample for the accounting year 2005 and sampling plan for the accounting year 2008

Code Type	Actual sample for the accounting year 2005					
	DIM0 (a)	DIM1 (b)	DIM2 (c)	DIM3 (d)	DIM4 (e)	total (f)
1000 & 6000	6	36	8	21	1	72
2010 & 2030	0	24	35	66	4	129
2020	1	9	23	35	3	71
3210 & 3400	0	11	13	38	3	65
4110	0	37	52	14	0	103
4120	0	12	14	7	0	33
4200 & 4400	2	13	7	4	0	26
4300	0	8	15	11	0	34
5010 & 5020 & 5030	2	7	22	31	1	63
7100	1	4	6	4	0	15
7200	0	4	18	21	0	43
8110 & 8120	0	1	14	4	0	19
8130 & 8140	2	8	6	5	0	21
8200	3	8	4	9	0	24
Total	17	182	237	270	12	718

Table 4.2 Actual sample for the accounting year 2005 and sampling plan for the accounting year 2008 (continued)

Code Type	Sampling plan for the accounting year 2008			total (j)
	DIM1 (g)	DIM2 (h)	DIM3 (i)	
1000 & 6000	22	9	9	40
2010 & 2030	13	10	13	36
2020	46	27	46	119
3210 & 3400	13	8	10	31
4110	10	16	7	33
4120	8	12	4	24
4200 & 4400	70	15	35	120
4300	13	17	10	40
5010 & 5020 & 5030	27	27	42	96
7100	4	13	7	24
7200	14	17	26	57
8110 & 8120	5	6	5	16
8130 & 8140	30	11	15	56
8200	7	5	16	28
Total	282	193	245	720

Code Type	Comparison of the former sample and the sampling plan			f/j
	(a+b)/g	c/h	(d+e)/i	
1000 & 6000	190.91	88.89	244.44	180.00
2010 & 2030	184.62	350.00	538.46	358.33
2020	21.74	85.19	82.61	59.66
3210 & 3400	84.62	162.50	410.00	209.68
4110	370.00	325.00	200.00	312.12
4120	150.00	116.67	175.00	137.50
4200 & 4400	21.43	46.67	11.43	21.67
4300	61.54	88.24	110.00	85.00
5010 & 5020 & 5030	33.33	81.48	76.19	65.63
7100	125.00	46.15	57.14	62.50
7200	28.57	105.88	80.77	75.44
8110 & 8120	20.00	233.33	80.00	118.75
8130 & 8140	33.33	54.55	33.33	37.50
8200	157.14	80.00	56.25	85.71
Total	70.57	122.80	115.10	99.72

A data warehouse contains different data marts. First a 'Flemish FADN' data mart and a 'Profitability' data mart will be developed. Each table of the Flemish FADN data mart contains data of the Flemish FADN and provides an answer to a specific frequently asked question or a specific analysis that is carried out on a regular basis. The Profitability data mart will contain all tables that should be included in the yearly publication on the profitability of farms in Flanders.

Other data marts that are planned to be developed are:

- an SGM data mart (or a Standard Output data mart) to ease reporting to the Directorate-general Statistics Belgium of the Federal Public Service Economy and the Walloon Region;
- a typology data mart which will be fed back to the Flemish FADN data mart;

- a CLE-FADN data mart with historical accounting data (accounting year 2003 and backwards);
- an EU-FADN data mart for the computerized manipulation of the information that has to be supplied to the EU-FADN; and
- data marts for different standard reports, such as reports on pig farms, dairy farms or horticultural farms, and for contributions to reports of other institutions.

4.7 Conclusions

This text gives a brief introduction to the new farm accountancy data network managed by the Division of Agricultural Policy Analysis of the Department of Agriculture and Fisheries of the Flemish government. The recent history of the collection of farm accountancy data in Flanders, the differences between the current Flemish and the former Belgian FADN and the data flows in the FADN are described. Furthermore, two of the tasks of the central service of the Flemish FADN, the participant management and the data warehouse, are discussed in more detail.

A first main conclusion that could be drawn from the implementation of the new FADN in Flanders is the crucial importance of a blueprint based on profound analysis of all processes as well as on all needs and all expectations of all stakeholders. Information that was available but has not been soundly analysed at the preliminary stage, might later on reveal that a different approach should be adopted. Once the implementation of certain changes has started, valuable time and resources might be wasted if the approach needs to be adjusted.

Secondly, by opting for an existing commercially available software package, the members of the FADN faced certain problems with the adaptation of the existing commercial accountancy software to the specific needs of an FADN, which they probably might not have encountered if they would have developed a new data input tool from scratch themselves. These problems are for instance related to the fact that the documentation on the software is the property of the software company and cannot easily be consulted by the members of the FADN or to the fact that only employees of the software company can make changes to the software.

Finally, it showed that a new FADN will only be successful if all people involved are convinced of the need of the changes that were made to the FADN and that all feel comfortable with the new situation. This can be achieved by paying particular attention to the management of the change process for instance by consulting all (future) users and FADN team members from the start, by taking care that everyone is involved in some part of the change process, by being frank with all team members about less positive aspects of the changes, by organizing special trainings with the new pc tools and by offering individual coaching.

Acknowledgement

I wish to thank my colleagues for the valuable feedback and suggestions to improve this text.

References

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Website AMS, <<http://www2.vlaanderen.be/ned/sites/landbouw/index.html>> (in Dutch).

5. Main issues in the renewal of the IT system of the Irish FADN

Brian Moran and Liam Connolly¹



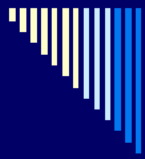
**Main Issues in the
renewal of the IT System
of the Irish FADN**

Brian Moran & Liam Connolly

Farm Surveys Dept, Teagasc,
Rural Economy Research Centre,
Athenry

¹ Farm Surveys Dept, Teagasc, Rural Economy Research Centre, Athenry

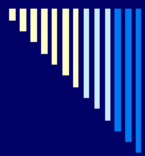


National Farm Survey (NFS) - Background

- TEAGASC – Farm Surveys Department
 - Operate the National Farm Survey

- Long running – First started in 1972

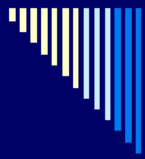
- Farm Accounts Recording System carried out annually on a representative sample of Irish farms



NFS - Objectives

1. Fulfil Ireland's statutory obligation by providing data on Irish farm output, costs and incomes to FADN
2. Determine the financial situation on Irish farms
3. Measure the levels and variation in farm performance
4. Collect and analyse socio-economic data on Irish farms
5. Provide a database for economic and rural development research and policy analysis





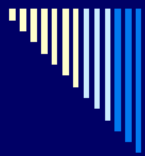
NFS - Sample

- Annual Survey of 1200 Randomly Selected Farms (CSO)
- 150-200 Farms replaced each year

- Replacements determined by examining typology

- 50% Co-Operation rate

- Weighting



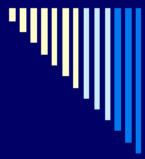
Role of the Farmer

- No obligation to participate

- No financial reward

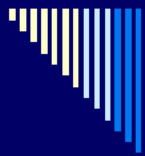
- Benefits
 - Farm management report
 - Comparative Analysis Report





Farm Recorders

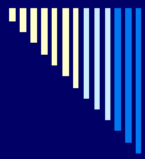
- 17 Farm Recorders
- 1200 Farm Returns
- Farms visited 3-4 times annually
- Also complete 'Add-On' Surveys in Autumn & Summer



Additional Surveys

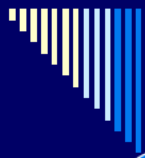
- Summer & Autumn Surveys
- Topics not covered in main survey
- Researchers, Advisors & Students
 - PhD thesis
 - Farm Safety
 - Farm forestry



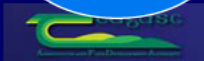


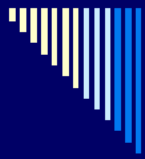
NFS Outputs

- NFS Annual Report
- FADN Data
- REPS Report
- Standard Gross Margin Data
- Source of Micro Data to CSO
- Data for Farm Advisory Planning Handbooks
- Database of Continuous Data from 1984



Impact (NFS Stakeholders)

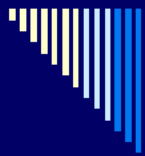




Impact and relevance

How NFS data is used:

- Farm planning and budgeting
- Technical articles
- Teagasc programme development
- European policy
- Monitoring impact of REPS
- Policy analysis
- EU legislation
- Ag and national statistics
- PhD studies
- Update knowledge of Teagasc staff and industry personnel
- Developing farm plans
- FAPRI analysis
- Negotiation in WTO
- Informing government of impact of changes in policy



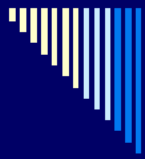
NFS / IT BACKGROUND ISSUES

- Manual Recording – Farm Level
- Operational – Fortran Programmes on VAX
- VAX due to be decommissioned

IT ISSUES/PROBLEMS:

- Delays Due to Manual Recording
- Old System Inflexible – Hard Coded
- Staff Dependent
- Bottleneck Delivering to Stakeholders
- Difficult to Change / Update
- Processes not Documented



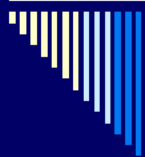


NFS / IT PROJECT

- **Phase I** - Develop Electronic Farm Recording System

- **Phase II**
 - Document Existing System – 2004
 - Build New System – 2005 On-going
 - Web Based Sequel Server Database

Current NFS: On-going on old platform during IT Development Process

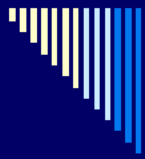


Phase I – Development of Electronic Recording System

- Manual Recording only until 2004
 - Delays in processing time
 - External data preparation
 - No farm level Validation

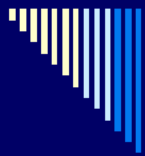
- 04-06 – Developed in-house data collection system
 - Excel Based System
 - Developed in Conjunction with Farm Recorders





Data Collection

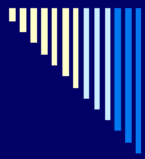
- Manual to Electronic Recording since 2004
- 80% Collected electronically in 2006
- Developed in-house
- Validates data on input
- Large input from farm recorders
- Improved efficiency



Excel Based Recording System

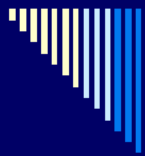
- Advantages
 - In-house System
 - No Licensing Issues
 - Very Flexible
 - Complete Control
 - Validation In-Built
 - Instant Reports
 - Improved Submission Rate
 - Better Perception
 - Shared Network drives
- Disadvantages
 - Poor IT Skills
 - Fear of Change
 - Files are large





Excel Based Recording System

- Reasons for success
 - Kept system very similar to book design
 - Identified Early adaptors
 - Recorders took Ownership of the System
 - Offering them benefits in recording time
 - Regular Feedback from staff

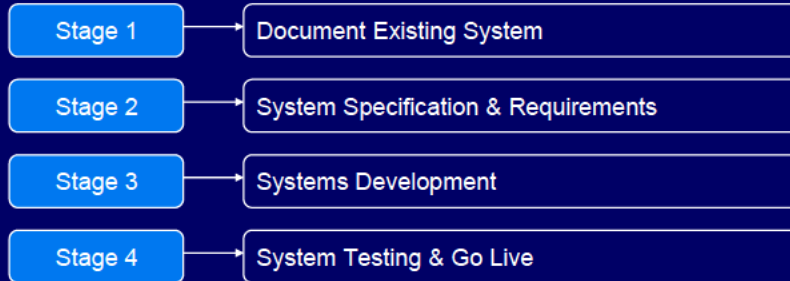


PHASE II – Data Analysis, Retrieval & Storage

- Process, Validate & Analyse Data
- Create/Populate New Database
- Generate Reports
 - Individual Farm Report, Annual National Report, FADN Report, Comparative Report, REPS Report
- Create/Populate Reporting Database
- Historical Database – Archive all NFS Data 1984 to 2005



Methodology – Phase II



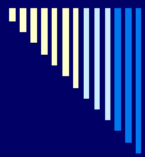
Consultation Between IT Consultants & NFS staff throughout



Stage 1 – Document Existing System

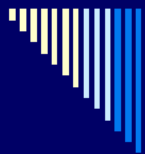
- Old System – Digital MicroVAX 3100
 - VMS Operating System
 - Application programs written in Fortran
 - No Documentation
 - Consultants Hired to Specify & Document System





Stage 2 – System Specification & Design

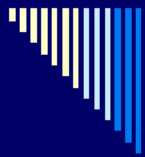
- Database – Microsoft SQL Server
- Reporting Tool – Seagate Crystal Reports
- Web Browser Based
- Menu Driven
- Secure & Flexible
- Main Database & Reporting Database
 - Overview



Stage 1 – Document Existing System

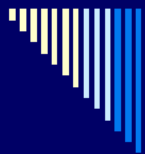
- Old System – Digital MicroVAX 3100
 - VMS Operating System
 - Application programs written in Fortran
 - No Documentation
 - Consultants Hired to Specify & Document System





Stage 3 – System Development

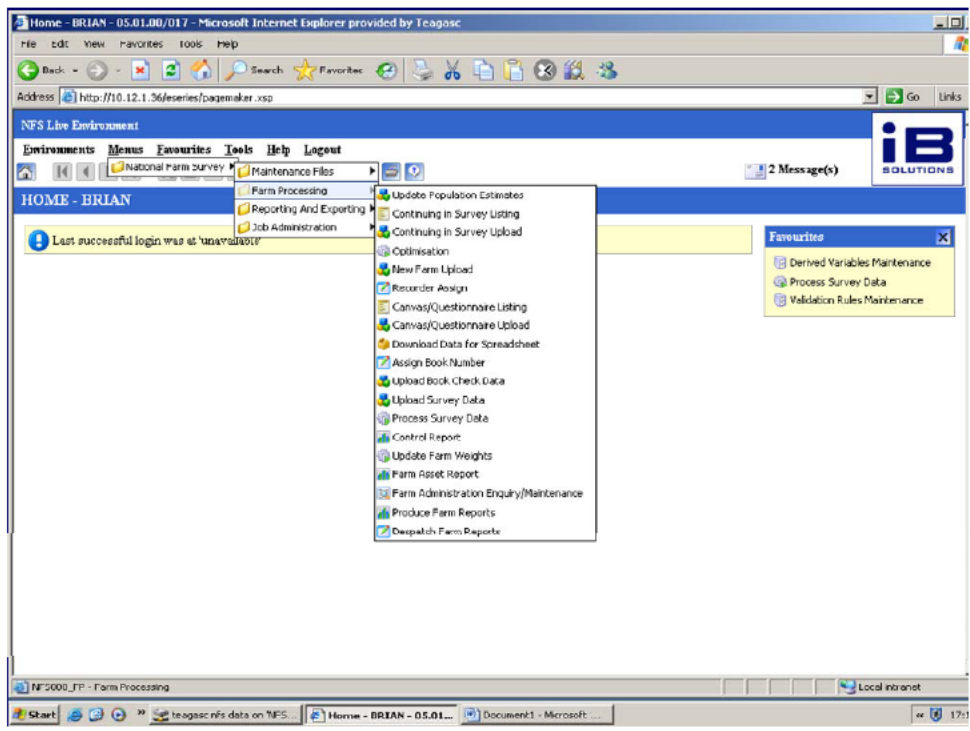
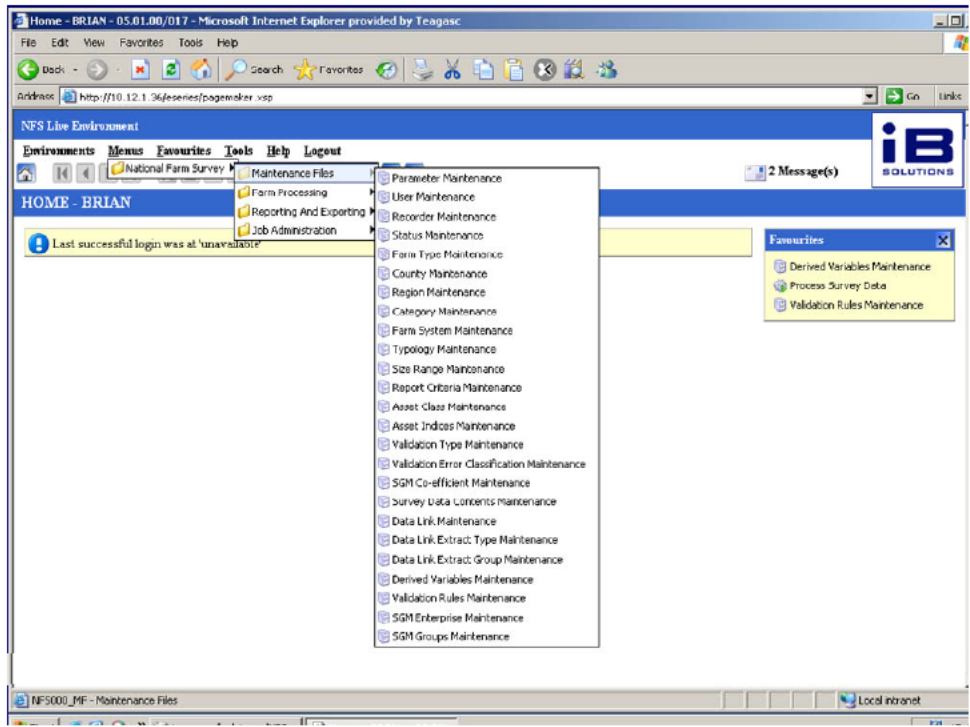
- EU wide tender
- Project Commenced in Jan '05
 - Different company selected phase II
- Completion in 15 months – Mar '06
- Teagasc Staff responsible for Specification & Testing
- Expected Completion March '08

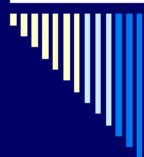
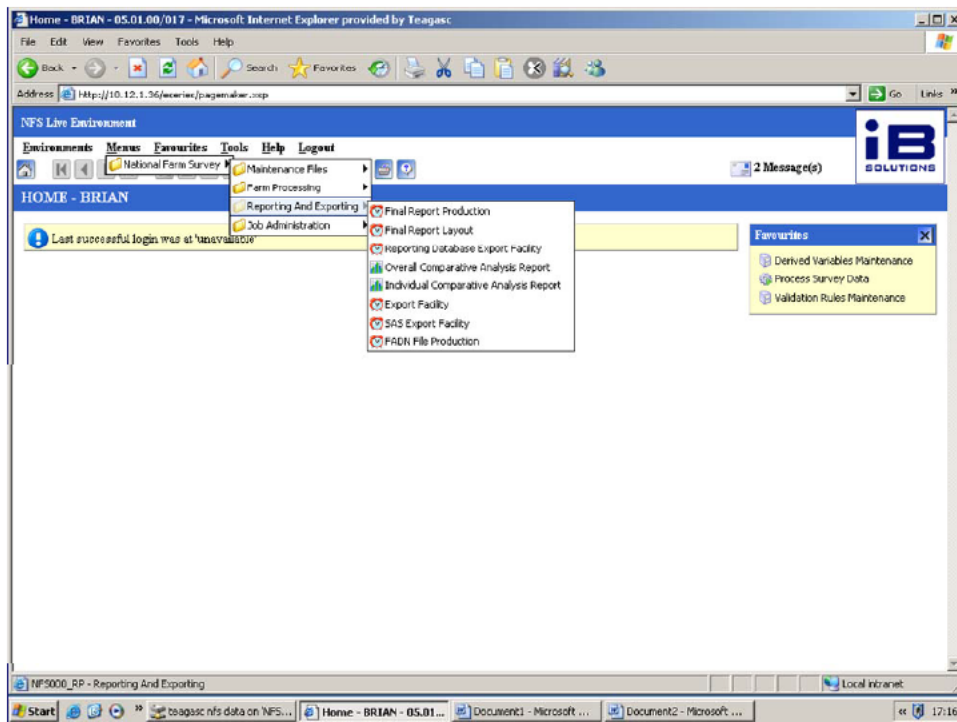


System Design – Key Requirements

- Flexible & Secure
- Menu Driven System
- No programmers required
- Compatible with Data Input Programs
- Flexible Export facility – To avoid bottlenecks in outputting data
 - Screenshots



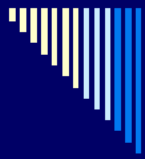




Stage 4 – System Testing & Go Live

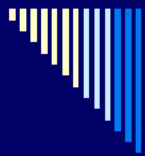
- Teagasc Responsible for all Testing
- New Data Verified against 'old' system
- Parallel Run 2006 Live Data
- Matching Derived Variables Calculation most problematic
- Go-Live with 2006 Data Processing
 - Historical Data Conversion to be completed early 2008





Summary – Lessons Learned

- Poor Specification – No testing of Documentation Specifications
- 2 Different Consultants Phase I & II
- Teagasc responsible for Testing
- Underestimation of Complexity
- Bi-Location of Consultants vs NFS staff



Summary – Lessons Learned

- Harmonisation of Data back to 1984
- Underestimation of Time & Resources
- Critical to Parallel Run Old & New System
- No Forward Planning



6. A milk marketing probe within the French FADN

Dominique Desbois (INRA - Département SAE2) and Jacques Nefussi (AgroParisTech-Paris)

Towards an observatory of marketing practices for the agricultural goods at the farm level: quality labels, milk price and holding profitability, a French case study.¹

Abstract

This communication is aimed at presenting the results that can be obtained on the basis of a 'Milk Marketing' accounting probe as a technical and economic data survey managed in the context of the French farm accountancy data network (RICA/FADN).

This paper will attempt first to point up the economic stakes as regards differentiation of the dairy products, which justify the implementation of this particular survey for collecting accounting and marketing information on milk. Then, this communication will present the regionalised scheme of collecting technical and accounting information on the marketing of milk at the farm level, the options retained for its management, and its embedding within the information system of the public agricultural statistics, particularly in the study of the trade between milk producers on the one hand, and the milk processing firms on the other hand. The first available results will be presented in order to evaluate the relevance of the collected information, in analysing the strategies endorsed by the dairy producers taking into account the range of outlets that are accessible for them and the conditions of production, which they must face.

Whether this production is principal or not in their holding, the average costs of milk paid to the French producers, active between 2000 and 2004, dropped. In this study, the explanatory factors to be analysed are the size of the agricultural holding, the regional area and the quality labels. The price variability of milk paid to the producers increases. It reveals different options between the productive choices relating to quality of milk (composition, production context) and the outlets. The regional effect or that of the holding size on variability is less important than that of the quality of the dairy products for general public consumption.

In the specialised dairy professional holdings, the income per hectolitre increases between 2000 and 2004, in spite of the milk price fall. The value of milk is more sensitive to the presence of the quality labels than to the size of the production unit.

In term of capital profitability, the dairy production systems present performances, which seem to be not very different. However, in 2004, the large farms have profitability higher than the other ones in spite of a lower rate of margin. The profitability of the hold-

¹ The authors thank Emmanuel Chantry, Head of the French FADN (RICA) Office, and Céline Rouquette, Subdirector for Income and Statistical Syntheses at SCEES, with regards to their careful reading of the manuscript and the support brought in the design and the management of the milk marketing accounting probe.

ings producing milks intended for the transformation into AOC products catches up with the profitability of the 'without label' producers.

Key words: farm management, quality label, marketing, milk, RICA, FADN, France, statistical test.

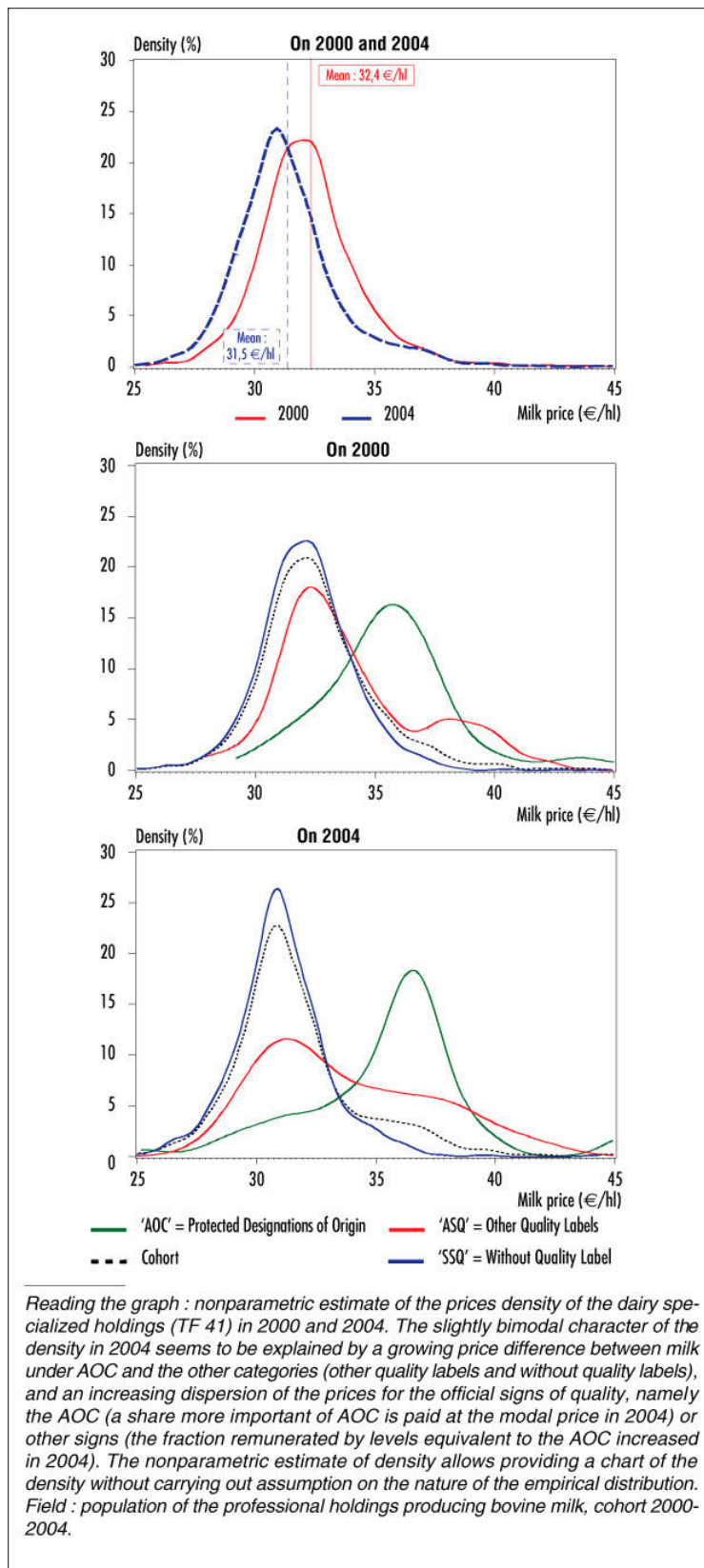
The milk price is an essential component of regulation for the milk-processing industry. It rests on rules of payment defined between the professionals under the aegis of the national joint-trade centre for dairy economics (CNIEL) taking into account several parameters, among which the composition of the delivered milk, its biological characteristics, and its use by the milk industry. The application of these rules leads to a price actually paid to a dairy exploitation. This price, that can be analysed starting from the RICA (the French farm accounting data network, cf. addendum below), is a very important factor of the dairy holding income. The observation of the milk prices at the farm level shows very strong price heterogeneity between the holdings. We analyse here some explanatory factors of the price differentiation and their impacts on profitability. These studied factors are: the area of production, orientation as regards quality labels, and size of the holdings. When there exists a price differentiation, for instance in field of the quality labels, this analysis makes it possible to quantify the price differences. The second question, which is treated in this paper, relates to the limits between the price differentiation and the profitability that it generates: what is the profitability of the farms engaged in strategies of costs or strategies of differentiation?

6.1 Differentiation of the prices

In order to measure the increases or losses in value, we study the price differences of milk at the farm level, taking into account its ability to carry labels of quality, during the 2000-2004 period, thanks to the merging of the statistical sources consisting of RA (the French agricultural census) for the labels and RICA for milk valorisation. The year 2000 is the year of the census, and this constitutes the temporal reference defining the cohort of dairy holdings carrying labels of quality. The year 2004, last year available for the RICA at the beginning of this study, is the first year of payment of dairy direct aid granted to support the income of the dairy producers in the context of the milk common organisation of market reform envisaged by the Luxemburg agreement on June 2003; in 2004, its amount reached €11.81 per ton of milk quota.

6.2 Regional differences reflecting the process of dairy abandonment

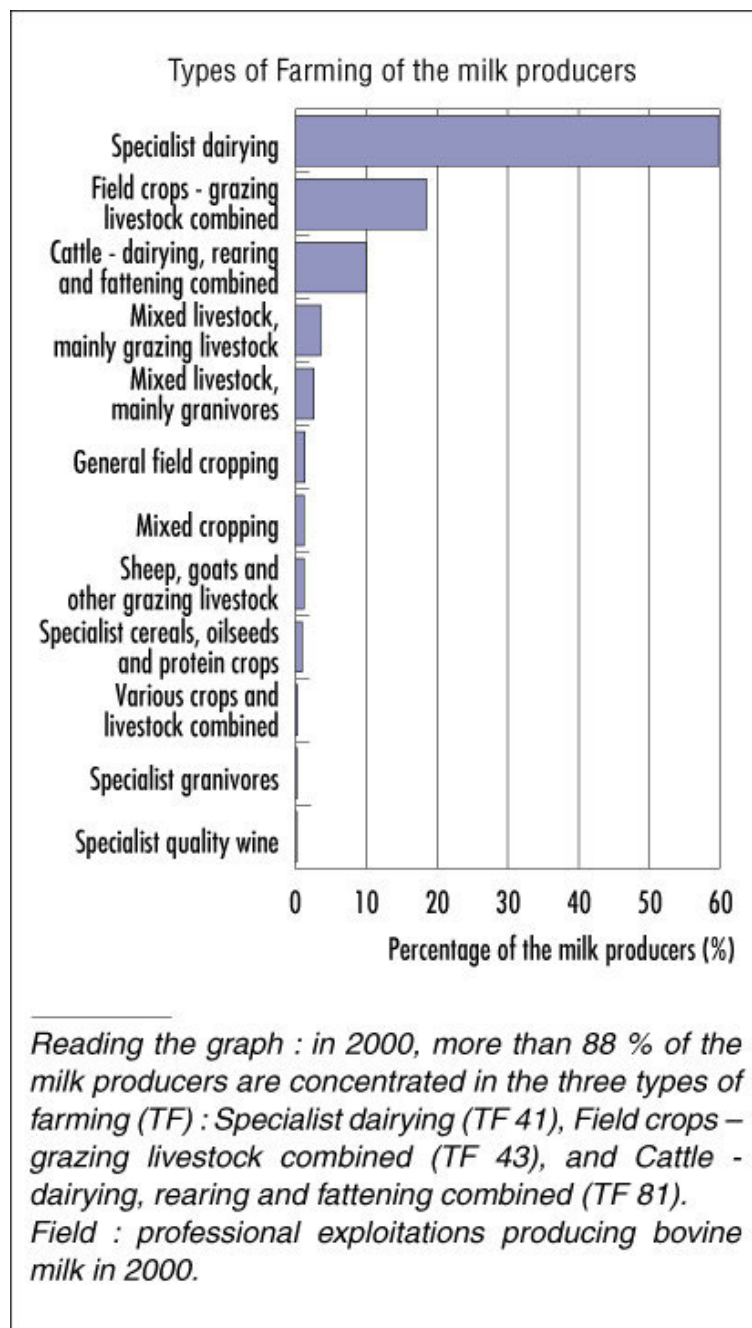
Milk price is conventionally fixed at the farm level through regional agreements concluded under the aegis of the regional joint-trade centres for the dairy economics (CRIEL). This is why price differences are analysed according to this regional structuring factor. In 2000, average price deviations can reach more than 10% between the areas.



Reading the graph : nonparametric estimate of the prices density of the dairy specialized holdings (TF 41) in 2000 and 2004. The slightly bimodal character of the density in 2004 seems to be explained by a growing price difference between milk under AOC and the other categories (other quality labels and without quality labels), and an increasing dispersion of the prices for the official signs of quality, namely the AOC (a share more important of AOC is paid at the modal price in 2004) or other signs (the fraction remunerated by levels equivalent to the AOC increased in 2004). The nonparametric estimate of density allows providing a chart of the density without carrying out assumption on the nature of the empirical distribution. Field : population of the professional holdings producing bovine milk, cohort 2000-2004.

Source : RA - RICA 2000-2004

Figure 6.1 Is there a resistance to the price fall between 2000 and 2004?



Source : RA - RICA 2000

Figure 6.2 The Specialist dairying type of farming (TF 41) gathers 60% milk producers

However, taking into account the overall price dispersion, these differences do not appear significant in general, except for the Rhône-Alpes area. In 2000, the highest prices are recorded in Rhône-Alpes (34.0 €/hl), Franche-Comté (33.8 €/hl) and Normandy, Upper (33.8 €/hl) and Lower (33.7 €/hl). The lowest prices are observed in Aquitaine (30.3 €/hl), in

Centre region (30.6 €/hl), and in Midi-Pyrénées (30.8 €/hl). These regional differences reflect rather well the process of dairy abandonment observed in some areas. In addition, they correspond to very different conditions of production: the mountain and the large dairy basins offer prices higher than the areas little directed towards the dairy production. Brittany is in an intermediate situation: 32.2 €/hl. Between 2000 and 2004, the prices paid to the holdings of the cohort lowered approximately 6%. The average prices observed worsened from 32.3 €/hl to 30.3 €/hl. However, the price median drops only by 3%. It is slightly lower than the average costs in 2000 and higher than the average costs in 2004, which shows a bending of the distribution: in 2004, the prices appear more dispersed. The nonparametric estimate of density (figure 6.1) confirms this analysis for the specialised dairy holdings (TF 41) showing that a process of price differentiation tends to take place: we can observe a shift from a unimodal distribution to a very slightly bimodal distribution, which allows conjecturing a mix of two populations. Price dispersion remains identical with an interquartile range of 2.5 €/hl, but resistance to this fall in the prices is unequal among the various areas.

Table 6.1 Regional averages of the milk prices (€/hl) delivered by the milk producers

	2000	2004	2004-2000	Test
Rhône-Alpes	34.40	33.34	☐	**
Alsace	34.23	33.56	☐	**
Upper-Normandy	33.79	32.36	☐	****
Franche-Comté	33.72	33.75	☐	ns
Lower-Normandy	33.7	32.94	☐	***
Lorraine	32.36	31.95	☐	ns
Pays de la Loire	32.25	31.48	☐	***
Brittany	32.18	30.96	☐	****
Champagne-Ardenne	32.13	30.52	☐	**
Burgundy	32.06	31.59	☐	ns
Nord-Pas-de-Calais	31.70	30.12	☐	ns
Picardie	31.61	30.83	☐	ns
Poitou-Charentes	31.50	30.87	☐	ns
Auvergne	31.16	30.08	☐	**
Midi-Pyrénées	31.08	30.52	☐	**
Limousin	30.76	30.05	☐	ns
Centre	30.55	30.37	☐	ns
Aquitaine	30.55	30.16	☐	ns
<i>Average price</i>	<i>32.39</i>	<i>31.50</i>	☐	****
<i>Median price</i>	<i>32.10</i>	<i>31.10</i>	☐	****

Reading the table: The results with the significance test are based on the T test of Student for matched sample on the averages of the price differentials by holding, confirmed by the nonparametric signed W test of Wilcoxon; the calculation of the risk selected is that of the paired T test (the least sensitive); the null assumption H0 tested is the nullity of the average of the individual differences between 2004 and 2000; * announces a risk of first species (to reject the H0 assumption wrongly) lower than 10%; ** a risk of first species lower announces than 5%; *** a risk of first species lower announces than 5 per thousand; **** announces a risk of first species lower than 5 per ten thousand; the tendencies marked in blue (↘) are thus significantly different from 0; **n. s.** announces non significant differences.

Field: Professional holdings producing bovine milk, cohort 2000-2004.

Source: RA - RICA 2000-2004.

In 2004, among the areas whose milk is best paid, we can note a sharp fall of the average costs in Upper-Normandy (-1.4 €/hl). Rhône-Alpes and Auvergne follow the general tendency (-1.0 €/hl). Only Franche-Comté maintains its position and becomes the leader.

Among the areas providing some of the less valued milks, prices fall sharply in the following areas: Champagne-Ardenne and Nord-Pas-de-Calais (-1.6 €/hl) and Brittany (-1.2 €/hl). The lowest falls are observed in Centre and Aquitaine. If a certain number of zootechnical factors, intervening explicitly in the milk price fixing scheme at the production stage (via the organoleptic criteria such as the fat contents rate or the protein contents rate), can explain some regional differences, other explanatory factors must be mobilized to analyse the evolutions: the regional strategies as regards quality label which make it possible to better value the agricultural production and the holding size.

6.3 Resistance of the 'general public' quality labels with the price fall

The holdings, which produce milks likely to be transformed into dairy products under quality label are compared with the farms producing milks not under quality labels at the transformation stage. Taking into account the sample size, three categories of quality labels were retained: Protected Designations of Origin (AOC), Product Compliance Certifications (CCP), and Other quality labels with schedule of conditions (Charters of good practices, etcetera). The Organic Farming label (AB) cannot be taken into account in this study because of the sample size (where are only 6 AB dairy holdings in the cohort 2000-2004).

Some labels are well known by the public: Protected Designations of Origin (AOC), the French Red Label certification ('Label Rouge'). They allow a differentiation of the dairy products (drinking milk, butters, cream, cheese) at the consumption stage. Other labels attest specific product specifications and bring guarantees on the production process: certifications of conformity of products (CCP) and Other signs of quality with schedule of conditions. They are little known from consumers and are focusing on the relationship between firms in the milk-processing industry, primarily the dairy producers and milk-processing firms. We will indicate them thereafter as 'professional' quality labels.

In 2000, the labels, which result in the highest prices, are the quality signs known by the public: the AOC-protected designation of origin (35.3 €/hl) and the Red Label (35.1 €/hl). These labels, known of consumers, generate more added value quite higher than the professional labels: certifications of conformity (32.0 €/hl) and other signs of quality (32.2 €/hl). If there exists a significant difference between the labels known of the public and the professional labels or the absence of labels, the difference does not appear to be significant between the professional labels and the absence of labels (31.9 €/hl). In 2004, the difference in valuation between milks carrying labels and those 'without quality label' is reinforced: 'without quality label' milks remain at the same price, whereas milks carrying AOC-protected designation of origin gain 43 cents per hl and those under label 1.55 €/hl. On the other hand, milks carrying professional labels have prices, which drop by 47 cents per hl (CCP-product compliance certificate) with 89 cents/hl for the Other quality labels. The analysis of variance results show that only the general public label group present a '2004-2000' trend of prices in rise, significantly different from that in fall of the reference group consisting of 'without quality label'.

Table 6.2 Median price of the delivered milk according to the quality label

	2000	2004	2000 - 20004	Test of the price differential 2004-2000
<i>General public:</i>				***
AOC Protected Designation of Origin	35.27	35.70	□	**
<i>General public:</i>				**
Red Label	35.13	36.68	□	
<i>Professional:</i>				ns
Compliance certificate	32.01	31.54	□	
<i>Professional:</i>				ns
Other quality labels	32.22	31.33	□	
<i>Without quality label</i>	31.95	30.95	□	Reference group
Cohort 2000-2004	32.10	31.10	□	****

Reading the table: The results with the significance test of the 2004-2000 price differential are based on an analysis of the variance according to the criterion of the quality labels. The tested null assumption H0 is the equality between the average of the 2004-2000 differential of price (-1,07 €) of the reference group (without quality labels) and that of each quality label; * announces a risk of first species (to reject the H0 assumption wrongly) lower than 10%; ** a risk of first species lower announces than 5%; *** a risk of first species lower announces than 5 per thousand; **** announces a risk of first species lower than 5 per ten thousand; the tendencies marked in blue (↘) are thus significantly different from 0; **n. s.** announces non significant differences. The estimates printed in bold are significantly different from the reference group (without signs of quality).

Field: Professional holding producing bovine milk, cohort 2000-2004.

Source: RA - RICA 2000-2004.

Table 6.3 Regional average of the differentials of price (€/hl) by exploitation between 2004 and 2000

Regions	AOC-Protected designation of origin		Without label	
	2004-2000 differential	test	2004-2000 differential	test
Upper-Normandy	-3.55	ns	-1.28	****
Lower-Normandy	-0.72	ns	-2.08	***
Alsace	4.99	na	-2.57	**
Franche-Comté	0.52	**	-0.63	**
Midi-Pyrénées	6.67	na	-3.36	*
Rhône-Alpes	-0.88	ns	-1.47	*
Auvergne	-8.97	ns	-1.61	**
Cohort	0.10	ns	-1.69	****

Reading the table: The results with the significance test are based on the T statistic of Student for paired sample on the averages, with confirmation by the Wilcoxon nonparametric test (signed W statistic); the calculation of the risk selected is that of the T paired test (the least sensitive); the tested null assumption H0 is the nullity of the average of the individual differences between 2004 and 2000; * announces a risk of first species (to reject the H0 assumption wrongly) lower than 10%; ** a risk of first species lower announces than 5%; *** a risk of first species lower announces than 5 per thousand; **** announces a risk of first species lower than 5 per ten thousand; the estimates printed in bold are thus significantly different from 0; **ns** announces non significant differences. **na** indicates that the test is not feasible.

Field: Professional specialist dairying holdings, cohort 2000-2004.

Source: RA - RICA 2000-2004.

This global analysis of the prices according to the quality labels must be confronted with regional dimension. Indeed, a quality label is not enough to create differentiation, it needs to be known by customers and carries specific 'benefit' for the customer. The distri-

bution of the labels is not independent of the regional factor. Hence, it is advisable to test the label effect, conditionally to the region. According to the regions, one can observe on the cohort 2000-2004 the price heterogeneity of the milks, which carry a quality label, particularly in the case of AOC-protected designation of origin. Computing the price difference between 2004 and 2000 for each holding, the average of individual differences by region makes it possible to regionalize the 'labels effect'.

The table of the price differences according to the quality labels (AOC) and the regions shows that an AOC-protected designation of origin makes it possible to slow down the fall in the price of milk. The fall is of 1.69 €/hl on our specialised holding cohort between 2000 and 2004 for milks without quality label. This fall in the price of milk is significant, contrary to the rise of 0.10 €/hl for milks carrying an AOC-protected designation of origin. This behavioural difference ascribable to the 'AOC effect' is logical: for standard milks, the regulation of the market is essential on regions; for milks which seek to be different, the success depends on the strategies implementations, in particular at the regional level.

Thus, on the regional level, one notes the capacity of the Franche-Comté to increase in a significant manner the milk price of 0.52 €/hl thanks to regional cheeses, namely the 'Comté'. On the other hand, Normandy does not manage to obtain such significant rise: falls of 0.70 €/hl in Lower-Normandy and of 3.55 €/hl in Upper-Normandy are not statistically significant. These averages can dissimulate individual disparities. It is the same for the Rhône-Alpes region whose price drops by 0.88 €/hl between 2004 and 2000.

The statistical analysis¹ makes it possible to specify the direction of these evolutions. The test of price trend carried out on a regional level (table 6.1) concludes with a positive difference 2004-2000 but not significantly different from zero for Franche-Comté, contrary to all the other regions, which record a fall. The analysis conducted conditionally to the areas for AOC label (table 6.3) led to a 2004-2000 price differential considered to be not significantly different from zero for the majority of great milk producing regions under AOC, except for Franche-Comté where the differential is considered to be significantly positive. Thus, taking into account the quality label conditionally to the regional factor makes it possible to specify the analyses of evolution carried out either according to the sole regional criterion (table 6.1) as a factor of structure, or according to the sole criterion of the signs of quality (table 6.2), as a factor of interest.

Hence, these results invite to be not satisfied with a regional average for milk price at the production stage, taking into account the possibilities of differentiation offered by the quality labels. They also result in wondering about the relevance of an aggregate at the national level for the AOC dairy products taking into account the diversity of the regional performances. A posteriori, they confirm the validity of the approach consisting in controlling the effect of the quality labels by the factors of structure upon which it can depend.

¹ We present the median prices, which have the advantage of being more robust with the sampling fluctuations than the average prices. In the same way, we control the results of the analysis of the variance by a non-parametric Kruskal-Wallis test as we check the results of the Student T test on the averages by those of the nonparametric Wilcoxon signed W test based on the medians.

6.4 The holding economic size has no impact on the price differentiation

If we observe significant price differences at the regional level and according to the quality labels, no significant difference in price appears between the dairy holding class of economic size in 2000 as in 2004. However, if the prices are slightly increasing with the size in 2000, this hierarchy disappears in 2004.

Table 6.4 Average costs of the milk delivered (€/hl) according to the economic size of the holding

	2000	Test	2004	Test	2000-2004
CDEX 6 and 7: from 8 with less than 40 DCE	32.21	ns	31.32	ns	□
CDEX 8: from 40 with less than 100 DCE	32.41	ns	31.60	ns	□
		reference		reference	
CDEX 9 and 10: 100 DCE and more	32.46	group	31.43	group	□
<i>Cohort</i>	32.39		31.50		□

Field: Professional specialist dairying holdings, cohort 2000-2004.

Source: RA-RICA 2000-2004.

6.5 The performance of the dairy holding measured by EBITDA per hectolitre

The income per hectolitre of produced milk can be analysed according to two ratios: EBITDA¹/hl and Earnings before tax per hectolitre (EBT²/hl). The main difference between these two measurements comes from the allowance for depreciation, amortization and cost recovery and the financial charges or products. The holding orientation as regards quality labels and the agronomic conditions affect the costs, in particular on depreciation. The correlation between these two ratios being very strongly positive (+0,94), we present only analyses based on the EBITDA/hl ratio.

6.6 Is the regional factor significantly influent?

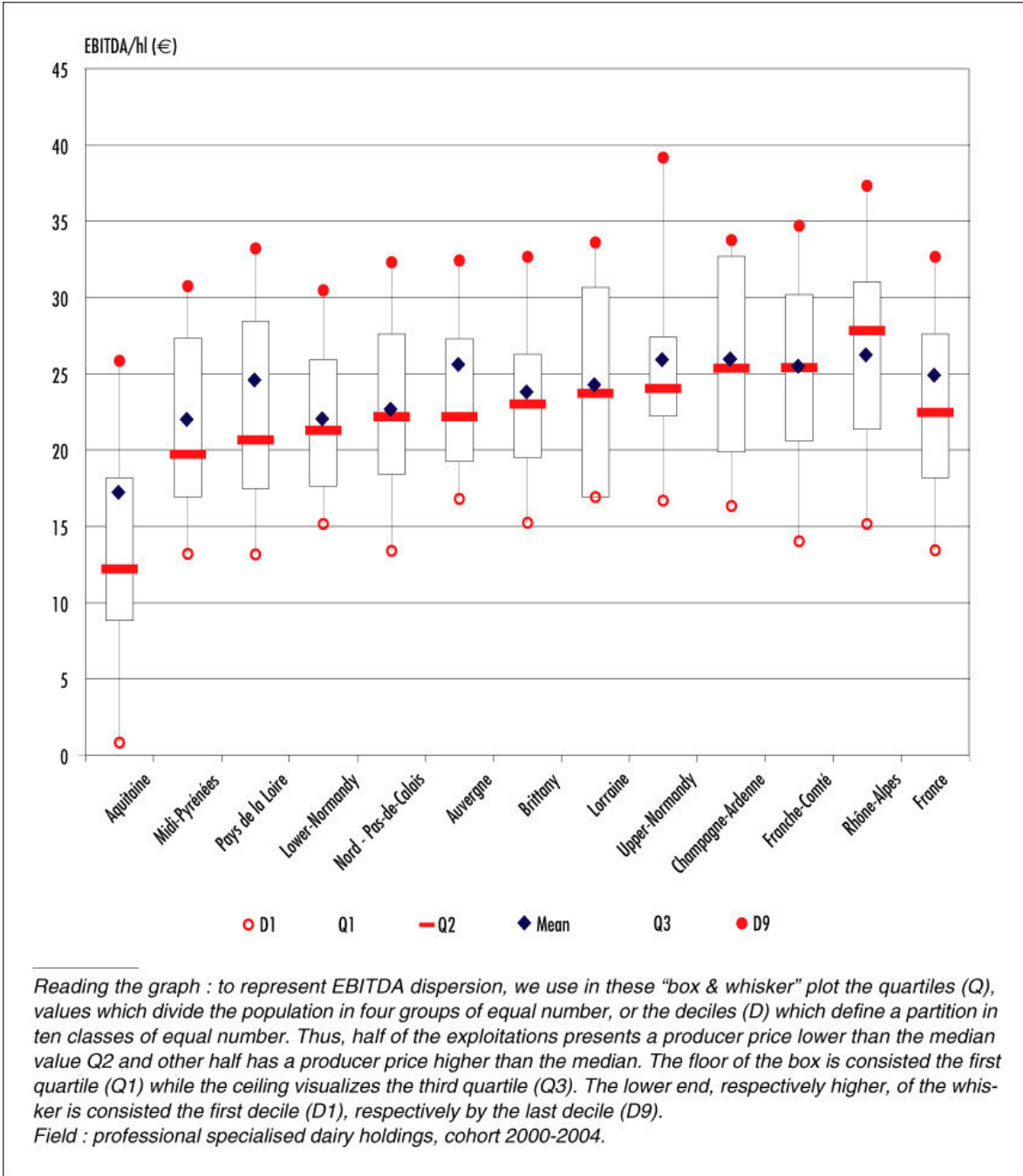
For the various areas, the central values of the EBITDA per hl range between 20 and 25 €/hl (figure 6.6). These differences, very important from an economic standpoint, cannot be regarded as statistically significant when taking into account the scales of individual dispersion which is internal with the regions: variability due to the interregional differences accounts for only 3% of total variability. Indeed, many other factors are likely to influence the EBITDA among which one can quote the cost of the production factors, in particular the cost of the animal feed, and the amount received for the production subsidies.

Two areas are distinguished: the Rhône-Alpes region has a median EBITDA/hl significantly higher than that of our sample; on the contrary, the Aquitaine region presents a

¹ In the case of French farm holdings, we can say that EBITDA (Earnings before interest, tax, depreciation and amortization) is roughly the same as *EBE* (*Excédent Brut d'exploitation*) upon which these analyses are based.

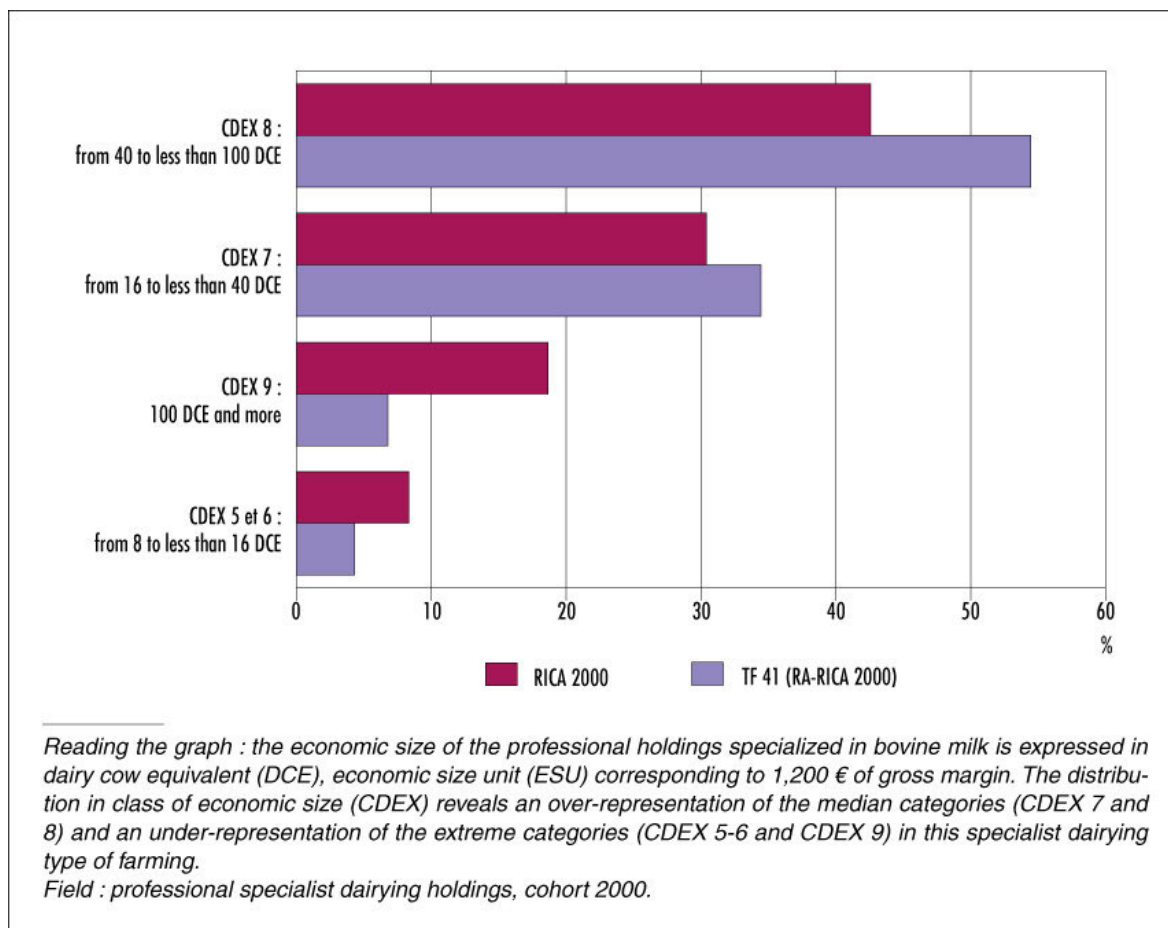
² Actually, we use the French *RCAI* (*Revenu courant avant impôts*), an equivalent for the Farm family income, which is very close to EBT in this context.

median EBITDA/hl which significantly appears lower than the other regions. The dispersion of the prices in Brittany is low, compared to that of the Lorraine or Champagne-Ardenne regions.



Source : RA - RICA 2000-2004

Figure 6.3 Variable scales of dispersion according to the regions



Source : RA - RICA 2000-2004

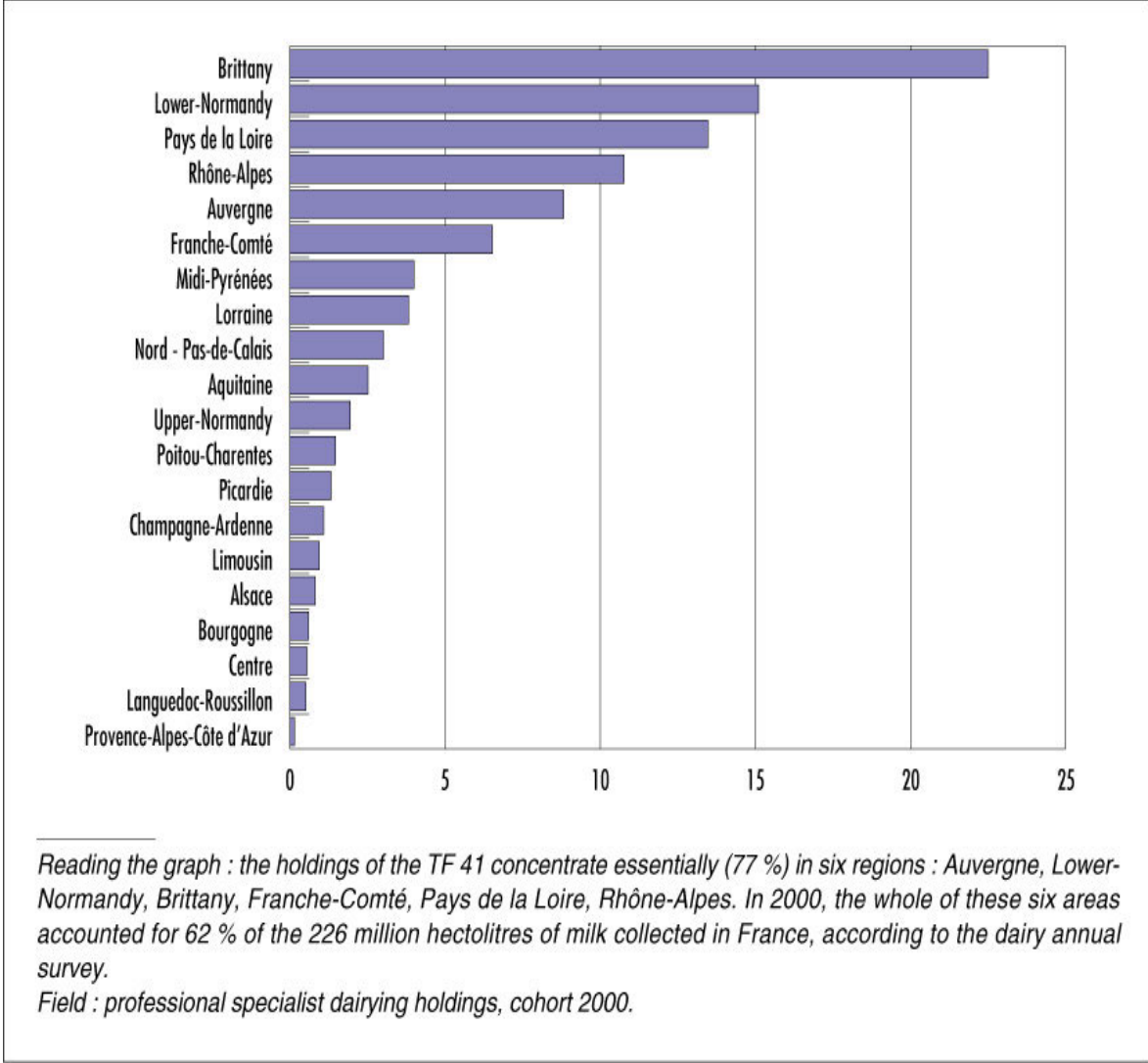
Figure 6.4 Strong prevalence of average economic size for specialist dairying holdings

With regards to the specialised dairy holdings, the regions which sell their milk at a high price are also those which draw the best economic results from them: thus, Upper Normandy and Franche-Comté, which prices are higher, appear among the regions having the best valorisation of milk in 2000. But Lorraine, Alsace and Rhône-Alpes with prices significantly lower, obtain comparable levels of valorisation in terms of EBITDA/hl while Lower Normandy presents lower performances.

Among the areas badly ranked in terms of price, Auvergne and Limousin are located above the regression line, apart from the confidence interval at 95% for the mean value, which indicates an economic performance significantly higher than the areas receiving a comparable price, respectively Champagne-Ardenne and Midi-Pyrénées. On the Contrary, Picardie, Nord-Pas-de-Calais, Poitou-Charentes and Aquitaine carry out performances significantly poorer than those estimated by the linear model adjusting the EBITDA to the producer price, that is to say with the regions of comparable price, respectively Brittany, Champagne-Ardenne, Midi-Pyrénées and Auvergne.

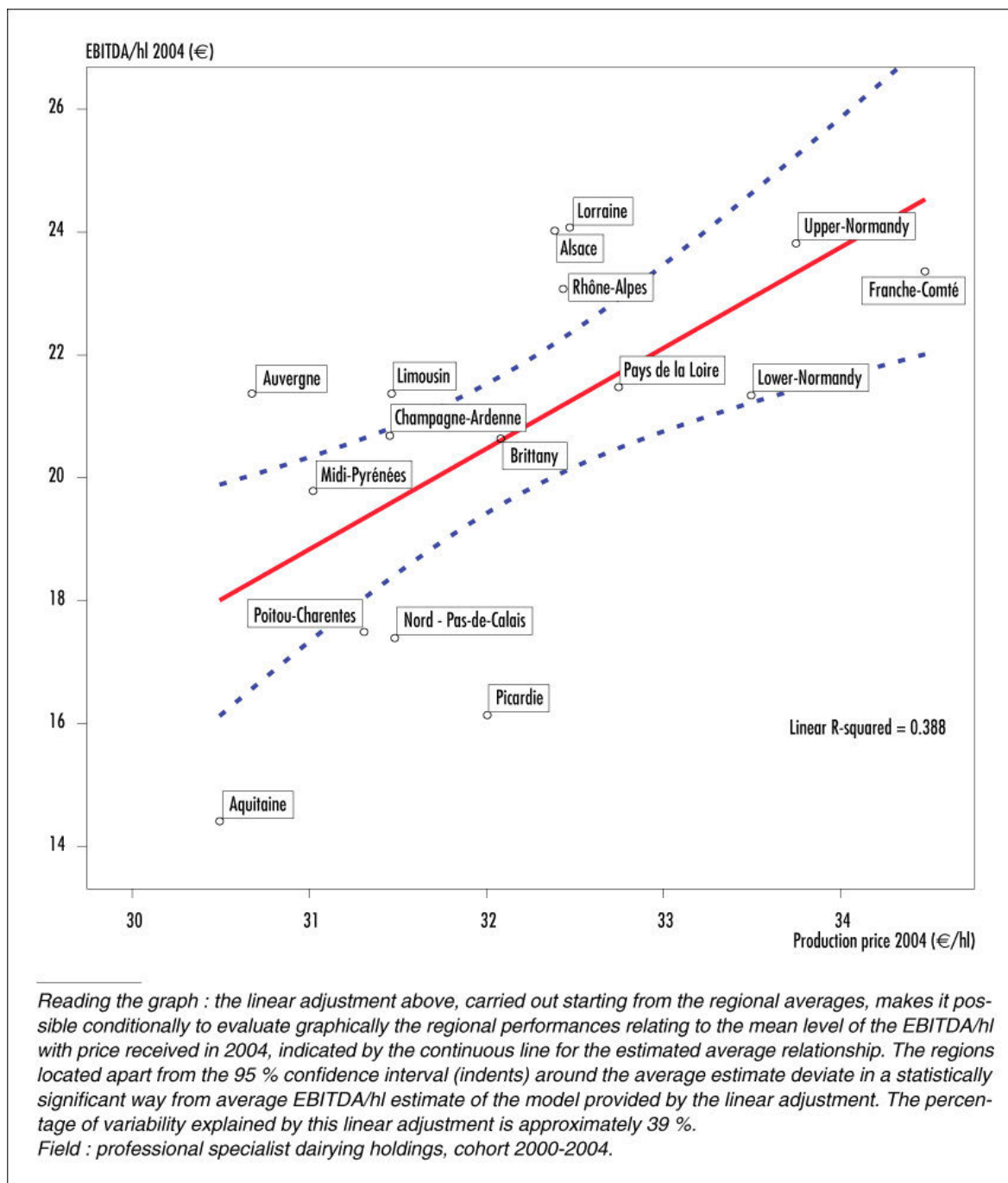
Notwithstanding the drop in prices during the period 2000-2004, the indicators of incomes increased: EBITDA/hl increased by 6% in France, and the EBT of 11%. These rises

of incomes integrate new direct aids, improving the income in spite of the prices fall. Increases in the income are unequally distributed over the regions. Thus, those regions having best added value do not progress in an identical way: the Rhône-Alpes region increases by 21%, Franche-Comté gains 9%, Upper Normandy remains stable. There is no comparable tendency for the least favoured regions: EBITDA/hl of Aquitaine loses 16%, whereas Nord-Pas-de-Calais progresses of 27%.



Source : RA - RICA 2000-2004

Figure 6.5 Regional distribution of the specialist dairying holdings (TF 41)



Source : RA - RICA 2000-2004

Figure 6.6 Average EBITDA/hl in relation to the prices allows to appreciate the regional results in added value

Table 6.5 Median values of EBITDA/hl in € according to the quality labels

	2000	Test <i>t</i>	2004	Test <i>t</i>
General public:		**		ns
AOC Protected Designation of Origin	23.48		25.12	
General public:		*		***
Label	24.71		29.23	
Professional:		ns		ns
Compliance certificate	21.29		20.27	
Professional:		ns		ns
Other quality labels	21.59		20.95	
Without quality label	21.03	Reference group	22.09	Reference group
<i>Cohort2000-2004</i>	<i>21.43</i>		<i>22.53</i>	

Reading the table: The results with the Student significance test are based on the T statistic; the tested null assumption H0 is the nullity for the average variation of the considered label with that of the reference group ('Without quality label'); ** announces a risk of first species lower than 5%; *** announces a risk of first species lower than 5 per thousand; **n. s.** indicates that the differences with the reference group ('Without quality label') are not significant.

Field: Professional specialist dairying holdings, cohort 2000-2004.

Source: RA - RICA 2000-2004.

6.7 The 'general public' labels appear to be the most remunerative

In 2000, the variations of EBITDA/hl are significant between the categories of quality labels: labels known by the consumers generate incomes higher than those of the professional labels and than those without quality label.

The AOC label brings significant variations to the level of incomes compared to the absence of label or even to the professional labels: the AOC brings 2.3 additional €/hl. The professional labels do not generate significant differences compared to the absence of label.

Table 6.6 Median values of EBITDA/hl in € according to the economic size of the holding

	2000	Test <i>t</i>	2004	Test <i>t</i>
CDEX 6&7: from 8 to less than 40 DCE	21.14	<i>ns</i>	22.16	<i>ns</i>
CDEX 8: from 40 to less than 100 DCE	21.48	<i>ns</i>	22.50	<i>ns</i>
CDEX 9&10: 100 DCE and more	22.50	<i>Reference group</i>	23.64	<i>Reference group</i>
<i>Cohort</i>	<i>21.43</i>		<i>22.53</i>	

Reading the table: The results with the Student significance test are based on the T statistic; the tested null assumption H0 is the nullity for the average variation of the considered label with that of the reference group ('CDEX 9 & 10'); ** announces a risk of first species lower than 5%; *** announces a risk of first species lower than 5 per thousand; **n. s.** indicates that the differences with the reference group ('CDEX 9 & 10') are not significant.

Field: Professional specialist dairying holdings, cohort 2000-2004.

Source: RA - RICA 2000-2004.

Between 2000 and 2004, for the cohort holdings with AOC-label's, the EBITDA/hl ratio is raising. On the contrary, the situation worsens for the holdings with professional labels: the EBITDA/hl falls under a lower level than those of the holdings not having qual-

ity labels. This evolution is the sanction for the relative trend of prices for this period. With regards to the holdings producing milk without quality label, progression of EBITDA/hl expresses either a structural effect - e.g. the holdings, which survived, would have experienced the most raised EBITDA/hl, or a cost reduction strategy - e.g. reductions of charges more important would have been realized for these exploitations.

6.8 No variation of income according to the dairy holding size

If the dairy holding size does not have impact on the milk prices at the farm level, there are no significant differences between the holding sizes for EBITDA/hl either. However, one can notice that the weakest class of economic size shows an added value for milk lower than the classes of higher size. In 2004 as in 2000, the largest holdings have a valorisation higher than those of the two other classes. Also, let us note that all the classes have EBITDA/hl in progression over the base period.

6.9 Profitability factors: rate of margin and capital turnover

Two ratios can be combined to give an account of the profitability of capital: the rate of margin, and the capital turnover. The rate of margin (EBITDA/sales) measures the share of value-added preserved by the companies after payment of wages and taxes related to the production. The capital profitability (EBITDA/fixed assets) refers in a relevant way this share of value-added to the fixed assets. The rate of margin gives a good ranking of the holding with regards to the production cost and the added value of milk. The profitability of capital takes into account the rate of margin and the capital turnover (sales/fixed assets).

Indeed, the capital profitability is expressed as the product of the rate of margin (EBITDA/sales) by the capital turnover (sales/fixed assets). Thus, two exploitations having identical rates of margin can have different profitability. This can happen when one of them has a higher capital turnover (sales/fixed assets), e.g. a higher turnover than some competitor with an equivalent amount of capital.

This is why, in spite of a lower rate of margin, a large dairy farm without quality label can obtain a better profitability of its capital compared to a small size farm producing milk for an AOC protected designation of origin. Conversely, even when a region is very dedicated to quality labels enabling it to obtain high prices and good rates of margin, if it aggregates a majority of specialised dairy farms producing relatively little milk in comparison with fixed assets, then this region is likely to have a low capital profitability.

6.10 Ranking of the regions in terms of margin and profitability

Except for Auvergne, which has the higher rate of margin (55%) in 2000 in spite of low prices, the ranking of the regions with regards to the margin differs little from the ranking that derives from the prices. After Auvergne, the highest rates of margin are observed in Franche-Comté (53%), Lorraine (52%), Alsace and the Rhône-Alpes (51%). In the same

way, the regions whose prices are lowest are also the regions, which have the lowest levels of margin. Thus, the rate of margin seems rather related to the capacity to develop milk, in particular thanks to quality labels.

By taking into account the capital turnover, a new factor is introduced into the analysis of profitability and modifies the ranking established according to the rate of margin in 2000: the highest profitability of capital is in Lorraine (33%), Picardie (30%) and in Pays de la Loire (29%). In the Rhône-Alpes region (22%), Auvergne (23%), and Franche-Comté (26%) where the production conditions are less favourable (presence of piedmont zones, of mountain, even of high mountain), rates of profitability are lower than in Brittany (28%). Between Upper and Lower Normandy, the differences in profitability are important but the rates of margin comparable.

Table 6.7 *Discordance of the regional rankings according to the rate of margin and the capital profitability*

	Rate of margin: EBITDA / sales		Capital profitability: EBITDA/ fixed asset	
	2000	2004	2000	2004
Auvergne	55	62	Lorraine	33
Franche-Comté	53	55	Picardie	30
Lorraine	52	51	Pays de la Loire	29
Alsace	51	43	Brittany	28
Rhône-Alpes	51	59	Alsace	28
Midi-Pyrénées	50	51	Upper-Normandy	27
Brittany	48	55	Franche-Comté	26
Champagne-Ardenne	46	57	Nord-Pas-de-Calais	23
Pays de la Loire	46	45	Auvergne	23
Upper-Normandy	44	49	Lower-Normandy	22
Lower-Normandy	44	48	Rhône-Alpes	22
Aquitaine	38	37	Champagne-Ardenne	21
Picardie	36	35	Midi-Pyrénées	18
Nord-Pas-de-Calais	34	46	Aquitaine	18
<i>Cohort</i>	<i>47</i>	<i>51</i>	<i>Cohort</i>	<i>25</i>

Field: Professional specialist dairying holdings, cohort 2000-2004.
Source: RA - RICA 2000-2004.

For each profitability class made up in 2000 and 2004 by means of a segmentation procedure based on the maximum likelihood criterion, we can identify the various situations corresponding to these relatively homogeneous rates of capital profitability. Thus, in 2000, among the first profitability class having median rates near from 20%, Nord-Pas-de-Calais is distinguished with the lowest rate of margin, compensated by one of the highest rates of capital turnover. Inversely, taking into account the conditions of production in mountainous or piedmont zones, the capital turnover of holdings in Midi-Pyrénées, Rhône-Alpes, Franche-Comté, and Auvergne is lower than those of the holdings from the less disadvantaged regions like Brittany, Pays de la Loire or Upper Normandy. Thus, with rates of margin much weaker, these western regions reach a median rate of capital profitability that

locates them in the same class of profitability (rate near of 30%) that Franche-Comté or Lorraine.

In 2004, consolidating the assumption of a process of differentiation in progress for the perennial holdings specialised in bovine milk, the segmentation procedure leads to identify three classes of capital profitability: the first being located around 18%, the second around 26% and the third around 30%. Brittany and Alsace occupy the first rank in terms of capital profitability. This situation is obtained thanks to an increase in the rate of margin and the rate of capital profitability. There is a reduction in the disparities of profitability between the regions: the regions of which profitability was among the highest ones (Lorraine, Picardie, Pays de la Loire) preserve their position while intermediate regions progress (Brittany, Upper Normandy, Franche-Comté, Auvergne).

Only the Rhône-Alpes region remains at a low profitability level, in spite of a strong increase in the rate of margin. Midi-Pyrénées and Aquitaine are outdistanced (rate of profitability close to 18%) because of their poor performances linked respectively to the rate of capital turnover for the first and to the rate of margin for the second. Hence, the capital turnover seems a critical factor for some regions.

6.11 Which advantage gives labels of quality in terms of profitability?

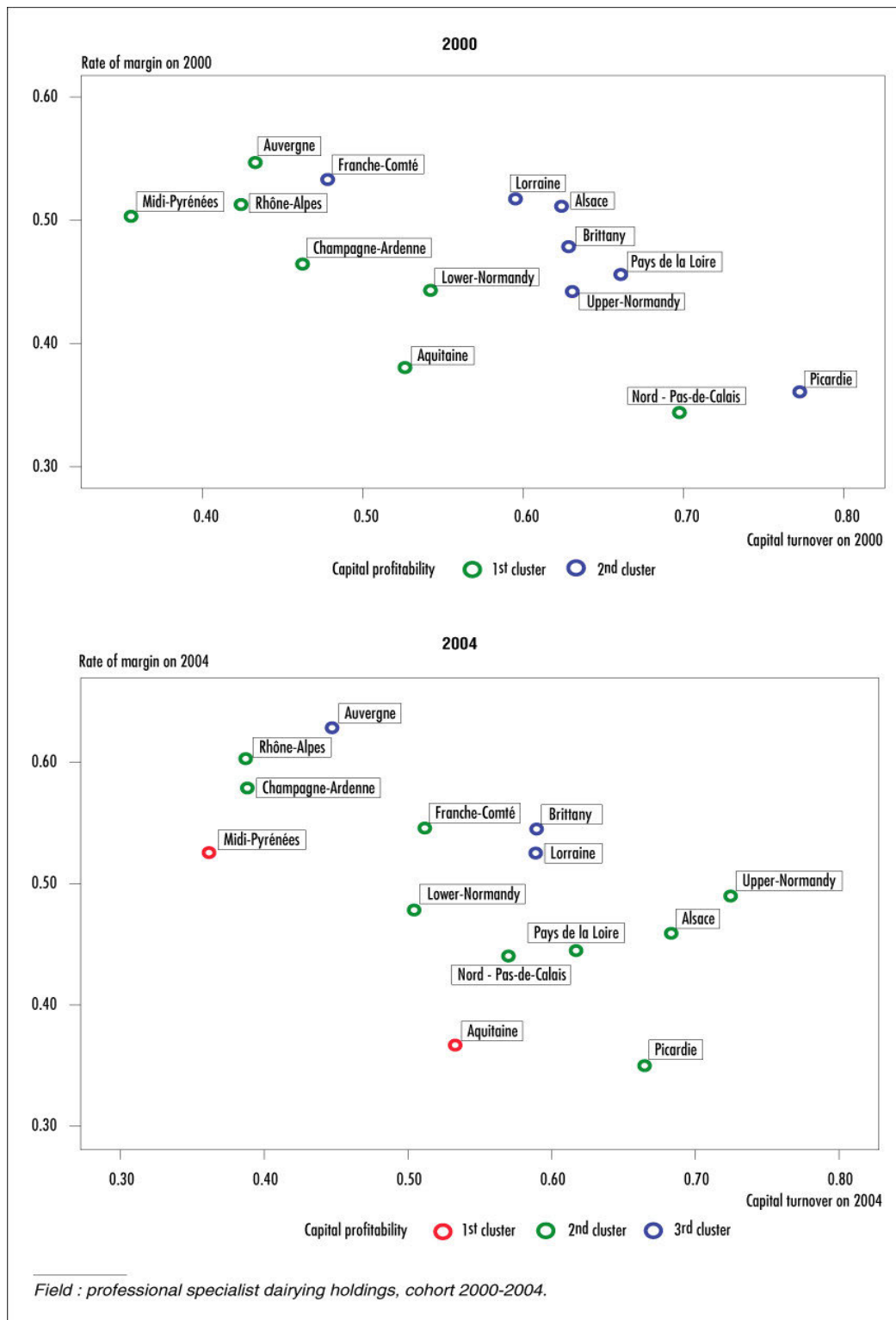
The rates of margin are significantly higher for the productions under AOC protected designation of origin compared to the productions without quality labels or with professional labels. By against, there is no significant difference between the productions without labels and the productions with professional labels.

Although the differences in profitability are not significant, the hierarchy between the labels is turned over in favour of the compliance certificates and the other quality labels. This difference between the rates of margin hierarchy and that of the rates of profitability could be also explained by different rhythms of capital turnover.

It is remarkable to observe that in 2000, the quality labels make it possible to restore a comparable profitability between farm holdings running extremely different production systems. In 2004, the exploitations engaged in strategies of differentiation by the mean of 'general public' (AOC) quality labels, progress and obtain a level of profitability identical to those which do not have labels, thus inducing a correction. However the holdings committed in strategies based on professional labels preserve an advantage compared to the others.

6.12 Progression of capital profitability appears more favoured with the small units

In 2000, the capital turnover is a big factor in the results in terms of profitability. If the rates of margin remain higher for the farm holdings of intermediate size, in terms of economic dimension, the economic profitability is directly related to the farm holding size. On the other hand, for 2004, there does not exist any relation between economic dimension and profitability. Thus, in some cases, differentiation could come to compensate for the disadvantages related to volumes of production.



Source : RA - RICA 2000-2004

Figure 6.7 Profitability class analysis according to the rate of margin and the capital profitability

Caption: 'Taux de marge' = 'Rate of margin'; 'Taux de rentabilité' = 'Capital profitability'; 'Taux de rotation du capital' = 'Capital turnover'.

6.13 Impact of the signs of quality: towards strategies of differentiation for the producers?

Do the variations observed on the prices really paid to the producers, and the differences in income estimated according to the quality labels, allow concluding as for the existence of strategies based on differentiation among the milk producers?

The benefit in terms of price differences are important for the producers under general public quality labels directly perceived by consumers (AOC). On the other hand, differentiation according to the professional quality labels does not seem to lead to very significant price differences.

The income per hectolitre, generated by milk under quality labels, increases between 2000 and 2004. However, the holdings belonging to competing universes directed by strategies of costs (milk without quality label) also have a growing income per hectolitre.

Two factors can explain this progression of the income in spite of the price falls: selection of the most competitive farm holdings and the fall of the costs. In the same time, the positive differential of income per hectolitre between the large farms and the other holdings persists even if one witnesses a correction of the small-scale farms. The analysis of the capital profitability of the dairy holdings comes to consolidate the following assumption: the large farms have profitability stronger than the other holdings in 2004 in spite of a lower rate of margin.

However, the differentiation policies into regions not having agronomic competitive advantages make it possible to compensate disadvantages compared to the farm holdings engaged in strategies of costs: there is an equivalence of profitability between the farm holdings producing milks without quality label and those who produce milk intended for transformation into AOC products. Lastly, the strategies based on professional differentiation are those, which show highest profitability in 2004.

The increase in the diversity of milk prices paid to the producers reinforces the entrepreneurial character of the milk production and implies strategic choices taking into account the diversity of the outlets and the conditions of production. Thus, the milk producer is less and less a simple 'deliveryman' without commercial concern.

The management of the dairy farm holding implies productive choices for which the nature of the commercial relation appears essential. To look further into the study of those mechanisms, it would be advisable to set up some statistical devices allowing to observe the business practices related to the agricultural deliveries of the basic commodities.

6.14 The design of the marketing milk probe and the scheme of analyses to be carried out

The objective of the milk-marketing probe is to study more precisely the determinants of the milk price at the production stage and to analyse the impact of the practices of marketing of the milk product on the economic performances and the income of the French producers in the principal dairy basins, according to the various classes of economic size.

The design of the questionnaire is focusing on the factors structuring the commercial relation between the milk producer and his purchasers: signs of quality, seasonal variation

of the deliveries in volume and value, fat contents, protein contents, bacteriological quality (cells, germs and butyrics).

The milk probe is an operation integrated into the RICA questionnaire by means of two layers (cf. Addendum 2: the milk marketing probe questionnaire): the 'producer' layer give information on the quality labels relating to the production of milk; the 'customer' layer informs to the technical and accounting features relating to the marketing of milk, for each customer (with a maximum of 3 customers).

The development of this questionnaire was carried out within the framework of a test over the year 2005 concerning the following pilot-regions: Auvergne, Brittany, Pays de la Loire, Franche-Comté, Lower and Upper Normandy, Rhône-Alpes. The probe is currently runned at the national level for the specialised dairy holdings (TF 41) over the accounting year 2006. For the accounting year 2007, it has been planned to extend this survey to the mixed orientations (Field crops and herbivorous - TF 81, Milk, breeding and meat bovines - TF 43, Poly-breeding with pigs and/or poultry - TF 72), with further information on bacteriological quality of the delivered milk.

The scheme of analyses plans to bring closer several statistical sources: the RICA, the Milk marketing probe, the Annual survey of companies and its Innovation layer for the companies of the processing milk industry, and the Annual dairy survey (PRODCOM).

The structure factors of the milk industry taken into account by the analysis are: the entrepreneurial structure of the purchasers (economic size and organisation form), purchase and marketing policies of the milk collectors, markets of the dairy transformation (standard of products, localisation, mix-product), sales strategies of the processing industry of milk, as well as the policies of innovation in the sector of the milk industries.

Addendum 1

'le RICA', the French FADN

Le RICA

The French Farm Accounting Data Network (RICA) collects the accounting data of the professional farm holdings in order to provide an empirical base to microeconomic analyses on the agricultural production. This sample survey is carried out according to the quotas method, targeting the population of the 'professional farms', concept implying that their agricultural goods are produced to be marketed. One of the main objectives of microeconomic studies is to evaluate the economic results obtained by the professional farmers, starting from the recording of the accounting and financial data to finally analyse individual dispersion starting from various indicators, technical and economic ones.

Professional farm holding

The professional farm, in addition to the generic criteria used to define the farm at the time of the French agricultural Census (*RA*), must reach an economic size of at least 8 European Size Units (ESU), equivalent to 8 dairy cows, and to use the equivalent work of a person occupied with the three quarters of its annualized time, that is to say 0,75 Annual Work Unit (AWU).

With the last French Agricultural Census carried out in 2000 (RA 2000), reference for the methodology of the present study, the universe of the professional farm holdings comprised 393,000 professional holdings on all 664,000 farms, accounting for approximately 60% in number but especially more than 95% of the released gross margin.

Universe of the French dairying producers

In 2000, the RICA sample comprised approximately 7,700 exploitations representing the 393,000 French professional farms. Among the farm holdings belonging to the RICA 2000 sample, 2,340 holdings produce bovine milk, representing a population estimated to 116,500 producers in 2000, that is to say nearly 30% of the professional holdings.

In 2000, among the dairy producers, one estimates at approximately 69,750 the number of specialised producers (Specialist dairying Type of Farming, TF 41) realizing more of two thirds of their gross margin with this product, that is to say nearly 18% of the professional exploitations.

Cohort 2000-2004 of the specialised dairy holdings

In order to study the influence of the quality labels on the milk price at production stage and on the economic results of the producers, we merge two statistical complementary sources, on the one hand, the Census of agriculture for information on the quality labels and, on the other hand, the RICA for the economic results.

On the basis of this merge, we count 1,220 exploitations representing in 2000 a population of approximately 70,000 specialised milk producers having answered the questions about the quality labels, asked at the time of RA. In 2004, the cohort 2000-2004 of perennial holdings, specialised in the production of bovine milk, which constitutes the empirical base of this study, comprises 670 individuals representing a population of approximately 37,400 producers. The rate of attrition (disappearance of the holdings from the sample) on cohort 2000-2004 of the specialised perennial dairy farms (11% annually) is slightly lower than that of the whole RICA sample (13% annually).

Prices at production stage estimated from the RICA

The estimate of the price at production stage provided by the RICA is computed as the ratio of the annual sum of the sales to the annual sum of the sold quantities for homogeneous products. Thus, these are average costs paid to the producer; they integrate the elements of remuneration (rebates) on the quality of the product paid during the financial year.

Addendum 2

The milk marketing probe questionnaire

Addendum 2.1: The producer layer

Layer 13: milk marketing, producer

	Quantity (litres)	Value (euros)	Price per litre (€)
Sale of milk for the 2006 accounting year:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Of which direct sales*:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Of which sales to the professionals**:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Number of professional customers:	<input type="text"/>		

Production within the framework of an official quality or origin label

AOC/AOP protected designation of origin (PDO) [0=no/1=yes/9=na]:	<input type="text"/>	If AOC/AOP-PDO, title:	<input type="text"/>
Red label ('Label rouge') [0=no/1=yes/9=na]:	<input type="text"/>		
Organic food ('BIO' label) [0=no/1=yes/9=na]:	<input type="text"/>		
Product Compliance Certifications (CC) [0=no/1=yes/9=na]:	<input type="text"/>		
Other protected designation of origin (PDO) [0=no/1=yes/9=na]:	<input type="text"/>	If PDO, title:	<input type="text"/>

Other quality labels with schedule of conditions

(quality charter, quality assurance, charter of good practices)

Trade mark 'AGRI-confiance' [0=no/1=yes/9=na]:	<input type="text"/>		
Charter of good breeding practices [0=no/1=yes/9=na]:	<input type="text"/>	If yes, title:	<input type="text"/>
Other (0=no/1=yes/9=na):	<input type="text"/>	If yes, title:	<input type="text"/>

* Are concerned by the 'direct sales', the quantities of milk leaving the dairy holding to be sold directly by the producer to the consumer, or wholesalers, or tradesmen practicing the retail sale or yielded free, without the intermediary of a company treating or processing milk.

** Are concerned by the 'sales to the professionals', the deliveries to the companies treating or processing milk.

Addendum 2.2: The customer layer

Layer 13 : marketing milk, customer 1

Company name of customer 1: ZIP code:

Company identification # [SIRET = SIREN+NIC] :

Type of company:

Please, inform the sales carried out over the 12 months of 2006 accounting year with customer 1

Accounting year 2006 date, end:

Month	Quantity (litres)	Value (euros)	Average price	Fat (g/l)	Protein (g/l)	Cells (#)	Germs (#)	Butyrics (#)
First month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Second month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Third month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Fourth month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Fifth month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Sixth month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Seventh month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Eighth month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Ninth month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Tenth month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Eleventh month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Twelfth month:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Total sales with customer 1:

Premium:

Penalty:

Total received from customer 1:

Total sales to professional customers:

7. Remote access; Optimal compromise between data use and privacy protection

Hans Vrolijk (LEI)



Remote access

Optimal compromise between data use and privacy protection?

Dr. Hans C.J. Vrolijk
Pacioli 15, september 9 – 12
Aulanko, Suomi

LEI
WAGENINGEN UR

Road to Pacioli



Overview

- Developments with respect to data and data use
- Options for using data for research purposes
- Evaluation of options

Developments

- Increasing availability of information at micro economic level
- Increased processing capacity for information
- Increased need for use of data

Considerations for (not) providing access

- Knowledge (data) is power
- (hiding behind) legal rules
- Privacy concerns
- Reputation is case of misuse of data
- Increase public value of data

Options for access

- No availability of data
- Distribution of data
- On site access (microlab)
- Scripting access
- Remote access

Criteria

- Value for policy and scientific research
- Ease of use
- Privacy protection
- Cost to implement and operate

Conditions for access

- Scientific research purpose
- Not linking of data to other sources
- Data can only be used for project for which permission is granted
- No publication of results based on less than 10 observations
- Publication of results of study
- Check of report before publication

Procedure

- Request for data use
- Submission of research proposal
 - Research goal
 - Method of research
 - Which data to be used
 - How will the results be disseminated
- Approval of proposal
- Sending and signing of contract for data use
- Access to information
- Submission of draft paper
- Checking of paper (privacy regulations, correctness of use)

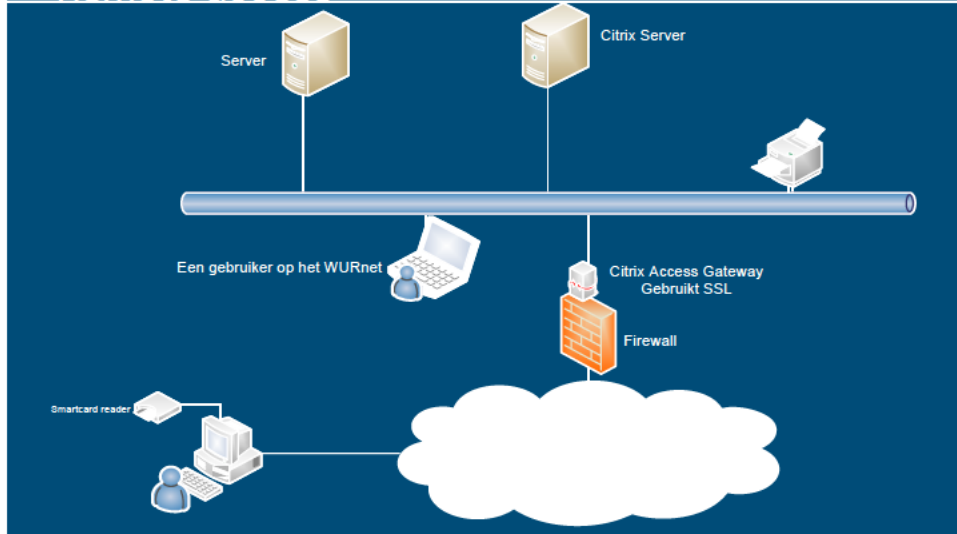
Microlab in practice



Scripting

- For example Luxembourg Income Study (LIS)
- SQL type of statements

Remote access



Evaluation of options

	Value for research	Ease of use	Privacy protection	Costs
No distribution	--	--	++	++
Distribution of data	++	++	--	++
Microlab	++	+	+	□
Scripting	+	+	++	--
Remote access	++	++	+	-

Discussion

- Remote access: optimal compromise between data use and privacy protection!?

8. Advanced results of FADN data; Internet reporting service

Arto Latukka¹, Olli Rantala¹

Abstract

The FADN (Farm Accountancy Data Network) produces large amount of structural, physical and economic data concerning agriculture in all Member States of the EU. The system is based on farm level accountancy data using common regulations in all phases of data collection and processing. The main function of the FADN is to provide information on the incomes and financial situation of agricultural holdings to the needs of the Common Agricultural Policy. The financial indicators in the Standard Results are of course focusing on income indicators, but e.g. net worth and cash flows have also been presented. In this study more diversified economic key figures have been calculated and analysed on the basis of the FADN data. The opportunity costs of the use of farmers own resources, labour and capital, have been calculated to be included in the total costs. This allows calculating additional indicators, which measure profitability and solvency of farms. The results indicate that agriculture is not very profitable business in the EU, the average entrepreneurial profit is negative and farmers receive quite low remuneration for their own labour and capital. On the other hand the average balance and net worth are quite strong, which partly stems from high market prices of e.g. land and quotas. The results also reveal large variation between the Member States.

MTT opened the online internet service 'Taloustohtori' (EconomyDoctor) containing the average key figures and financial statements of agricultural and horticultural enterprises from accounting years 1998-2005. The dynamic generation of tables on the basis of the user's selections makes comparisons of income and profitability easy and quick. Based on the same technology an online internet service, which provides the FADN Standard Results of EU member States from accounting years 1989-2004 was opened in June 2007. The service reproduces the data, which is downloadable from the public internet site of the EU DG AGRI. G.3.

MTT launched in September 2007 a new online internet service, which provides the FADN Advanced Results of EU member States from accounting years 1989-2004. The service offers many kinds of key figures, financial indicators, which measure profitability of the farms. The figures have been calculated based on the average level data, which is downloadable from the public internet site of the EU DG AGRI. G.3. This new internet service is presented in this paper.

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Keywords: Fadn, accountancy, profitability, solvency, key figures, profitability ratio

8.1 Introduction

The FADN (Farm Accountancy Data Network) is an information system, which was created for the management of the Common Agricultural Policy. The legislative mission of the FADN is to provide information on the incomes and financial situation of agricultural holdings in all Member States of the European Union. The system is based on farm level accountancy data using a common farm return and common definitions and rules in data collection and processing. This makes it possible to have harmonised and comparable data from different countries.

The main income indicators in the Standard Results are Farm Net Value Added (FNVA) and Farm Family Income (FFI), and both divided by Work Units respectively (AWU/FWU). FNVA shows the remuneration for the external factors and farm's own resources (labour and capital) and FFI is left as compensation for farm family's own work and capital. Thus all costs are not taking into account. The structure and organisations differ increasingly more in agricultural sector in the EU. The size, labour/capital intensity and legal forms of farms differ largely and the ratio between external and own resources varies considerably. The changes increase the demand for indicators, which would improve the view of the economic performance of farming and also amend the comparability of results to other enterprises of the economy.

The comprehensive FADN data enables calculation of more diversified financial indicators for individual farms and also for statistics. The data is practically as relevant as the official accounts used in the analysis of financial statements. To be able to calculate the costs of the use of the farm's own resources, the opportunity costs of own labour and own capital have been estimated at regional level. The calculation of total costs gives a broader insight into the economic results of farms e.g. in terms of return on labour and capital. It also allows using the same key indicator in farming as in other industries.

8.2 Data

The results presented in this paper are based on the averages data of FADN Standard Results of EU DG AGRI. G.3. The data can be downloaded from the public internet site (<http://ec.europa.eu/agriculture/rica/>). In addition to the indicators in standard results supplementary financial key indicators have been calculated and analysed based on the data.

8.2.1 Indicators

Farm Net Value Added

Farm net value added (FNVA, SE415) shows the compensation to the fixed factors (labour, land and capital), whether they are external or family factors. As a result, farms can be compared irrespective of their family/non-family nature of the factors of production. It

is still difficult to use FNVA in comparison between production types and member states because FNVA doesn't take into account how much fixed factors have been used to get certain amount of FNVA. By dividing FNVA by the annual work units (AWU) the work is taken partly into account, but not capital.

Family Farm Income

Family farm income (FFI, SE420) is one of the basic concepts of the FADN Standard Results. The wages, rents and interests paid have been subtracted and FFI is left as compensation to fixed factors of production of the family (labour and capital) and remuneration to the entrepreneur's risks (loss/profit) in the accounting year.

The FADN Standard Results do not use estimations of the remuneration to family factors (costs imputed for unpaid work and family capital). It is difficult to estimate, whether farmer has received some compensation to the risks, if the opportunity costs for the own capital (net worth) and family labour used in the production have not been calculated. It is also difficult to use FFI in comparisons between member states with different cost structure.

In order to be able to compare the results of agriculture in different MS and to verify whether the farmer also gets profit as a remuneration to the entrepreneur's risk, we should take into account the opportunity costs of own labour and capital. That was done in a study RI/CC 1341. Farm Family Income covers the costs due to the use of own labour and capital, the rest is remuneration to the entrepreneur's risks.

Opportunity costs

The annual working hours of the family are included in the FADN variables. In this study the opportunity cost of family labour is calculated by multiplying the number of hours worked by the farm family with the average hourly salary paid to external labour force. The average hourly salary is a global ratio calculated from FADN data at MS level and indicates the hourly wages of agricultural employees in each Member State (table 8.1). As a result we get wage claim, the opportunity cost of family labour. In this paper in all the tables are presented the averages of EU-24 and both two Member states from both tails of distribution.

Table 8.1 The averages and range of hourly wage in the EU in 2004

	Polen	Lithuania	...	EU-24	...	Sweden	Denmark
Hourly wage, eur/h	1.2	1.3	...	6.5	...	16.6	17.8

The opportunity cost of own capital, interest claim, is calculated by multiplying the average net worth of the accounting year with the average interest rate paid for loans (table 8.2). The average net worth can be calculated from the FADN variables and the average liabilities as well as interests paid are already available in the farm return. The average interest rate is calculated yearly to each Member State.

Table 8.2 The averages and range of interest rate in the EU in 2004

	Greece	Portugal	...	EU-24	...	Slovakia	Hungary
Interest rate, %	0.3	0.9	...	3.5	...	5.8	6.8

Table 8.3 The average opportunity costs of family labour and own capital (net worth) expressed as wage claim and interest claim, average in the EU in 2004

	EU-24
Wage claim	17,652
= (Unpaid labour input, hours * Hourly wage claim)	2,731 6.5
Interest claim	8,116
= (Net worth * Interest rate)	231,438 3.5

Entrepreneurial Profit

When the wage claim and interest claim for net worth are subtracted from FFI we arrive at the entrepreneurial profit indicating profitability of the production. This profit is compensation to the risks of entrepreneurship. In the accounting year 2004 the average entrepreneurial profit in EU was negative (€-7,739) but there are several Member States, where the entrepreneurial profit was positive. The entrepreneurial profit varies in member states from €-55,000 in the Netherlands to €7,700 in Czech Republic.

Table 8.4 The averages and range of entrepreneurial profit in the EU in 2004

	The Netherlands	Sweden	..	EU	..	Spain	Czech Republic
Family farm income	29,793	6,564	..	18,029	..	23,568	27,896
- Wage claim	46,627	43,533	..	17,652	..	13,094	10,351
- Interest claim	38,144	13,857	..	8,116	..	2,865	9,797
= Entrepreneurs profit	-54,978	-50,826	..	-7,739	..	7,608	7,748

Profitability ratio

The profitability of agriculture can also be measured by a concept of profitability ratio. This ratio is calculated by dividing Family Farm Income (FFI) by the sum of costs for family factors, which are the wage claim and interest claim for net worth. As a relative concept profitability ratio is well suited for comparisons between different years as well as farms representing different size classes and production sectors.

Table 8.5 The averages and range of the profitability ratio in the EU in 2004

	Sweden	Denmark	...	EU-24	...	Estonia	Lithuania
Family farm income	6,564	6,750	...	18,029	...	15,822	12,310
divided by (wage claim + interest claim)	43,533 13,857	32,341 21,579	...	17,652 8,116	...	7,056 3,341	4,588 1,390
= Profitability ratio	0.11	0.13	...	0.70	...	1.52	2.06

The profitability ratio of EU average is 0.70, which means that family farm can cover only 70 per cent of the sum of wage and interest claims. This can also be seen in the negative entrepreneurial profit. When the profitability ratio is 1.0 all production costs are covered and the entrepreneurial profit is zero.

In the accounting year 2004 the profitability ratio varied in Member States from 0.11 in Sweden to 2.06 in Lithuania, which means that the farmer achieved from 11 to 206% respectively of the wages level and interest rate set as the objective in those Member States.

There is a lot of variation in profitability ratio in each production type and each Member State. The profitability results show what kind of economic situation exists in each MS, when we compare the income of farmers in each country to the wages and interest level in their countries. If the same hourly wages claim and interest rate would be applied for all the MS, the results would of course be quite different.

Sensitivity analysis of profitability ratio

With the calculation of the profitability ratio, it is not so easy to determine, how large hourly wage and interest rate should be used in each member state. And there might also be some difficulties to define the net worth and working hours of the farm family. In table 6 there is presented a sensitivity analysis, where the wage claim has been changed +/- 20 percent and in table 8.7 where the interest claim would change +/- 20 per cent. In tables there are the member states with the highest and lowest relative change in the profitability ratio. As we can see, the profitability ratio is changing, as it should do, but the change is not very large.

Table 8.6 The averages and range of the profitability ratio in the EU in 2004 when the wages claim (working hours or hourly wage) would change +/- 20%

Wage claim change	Slovakia	Hungary	...	EU-24	..	Portugal	Greece
-20%	0.66	0.57	...	0.62	..	0.52	1.23
0%	0.67	0.62	...	0.70	..	0.62	1.47
+20%	0.67	0.63	...	0.72	..	0.64	1.53

Table 8.7 The averages and range of the profitability ratio in the EU in 2004

Interest claim change	Greece	Portugal	...	EU-24	..	Hungary	Slovakia
-20%	1.46	0.61	...	0.66	..	0.55	0.56
0%	1.47	0.62	...	0.70	..	0.62	0.67
+20%	1.47	0.62	...	0.71	..	0.63	0.69

Profitability of agriculture compared to other enterprises

The profitability ratio and return on labour and return on net worth derived from this are suited to comparisons within agriculture, but the profitability of agriculture and horticulture should also be compared to other types of enterprises.

When the wage claim is subtracted from family farm income, we arrive at the net profit which remains as interest on net worth. In 2004 in average level the net profit was in EU about € 7,700. The profitability figure most used in businesses, return on equity (= return on net worth), is obtained when the net profit is divided by the average net worth of the accounting period. In 2004 the average return on equity in EU was 0.16%, varying between -11.8% in Sweden and 13.8% in Lithuania.

Table 8.8 The averages and range of the net profit and return on equity in the EU in 2004

	Sweden	Denmark	...	EU-24	...	Latvia	Lithuania
Family farm income	6,564	6,750	...	18,029	...	9,000	12,310
- Wage claim	43,533	32,341	...	17,652	...	4,798	4,588
= Net profit	-36,969	-25,591	...	377	...	4,202	7,722
divided by net worth	313,901	442,434	...	231,438	...	42,165	55,832
= Return on equity	-11.78	-5.78	...	0.16	...	9.96	13.83

Capital turnover

The capital turnover shows how long time capital is tied in production. It is calculated by dividing the total gross return (total output + balance current subsidies and taxes; SE131 + SE600) with total assets (SE436). If the capital turnover is low, that means that capital is tied to the production for long periods of time. Agriculture is characterised by capital intensive production with a quite low return on capital. This may cause liquidity problems in production financed largely with external capital, because the interests and repayments often have to be paid over a short time period. This is why production cannot be financed with loans whose interests costs and repayments have to be paid during a short repayment period relative to the time during which the capital to be managed is committed to the enterprise.

Table 8.9 The averages and range of the capital turnover in the EU in 2004

	Ireland	Slovenia	...	EU	...	Estonia	Latvia
Total gross return	52,033	22,865	...	72,324	...	67,537	36,764
divided by total assets	548,157	207,762	...	277,112	...	126,569	58,064
= Turnover ratio	0.09	0.11	...	0.26	...	0.53	0.63

Solvency

The losses of business activity reduce the net worth of an enterprise, which means that additional financing is needed in order to continue the operations in the same extent as before. Also the low capital turnover may increase the need of extra financing.

The equity ratio measures the solvency, i.e. the ability to withstand losses and to fulfil commitments in the long run. The equity ratio is the share of net worth (SE501) out of total capital (SE436). In 2004 the average equity ratio was about 84% in EU varying be-

tween 43% in Denmark and 99% in Greece and Italy. In the light of equity ratio the financial structure seem to be quite strong.

Table 8.10 The averages and range of the equity ratio in the EU in 2004

	Denmark	France	...	EU-24	...	Greece	Italy
Net worth	476,236	195,611	...	233,790	...	68,833	304,215
divided by total asset	1,115,485	311,469	...	277,112	...	69,186	308,414
= Equity ratio	43	63	...	84	...	99	99

Hourly earnings of farm family

Farmers' incomes can also be compared to the incomes of the other wage earners. The concepts used in these comparisons are annual earnings and hourly earnings. The interest claim for net worth has to be first deducted from family farm income, because wage earners do not have to invest to their own workplace. Annual earnings obtained through this are divided by the hours of family labour and we arrive at hourly earnings of the farm family. In 2004 the hourly earnings in EU was very low, in average only around €3.6 varying from €-8.5 (Slovakia) to €9.4 (Spain).

Table 8.11 The averages and range of the annual earnings and hourly earnings in the EU in 2004

	Slovakia	Denmark	...	EU-24	..	France	Spain
Family farm income	59,652	6,750	...	18,029	..	27,579	23,568
- Interest claim	84,264	21,579	...	8,116	..	6,353	2,865
= Annual earnings	-24,612	-14,829	...	9,913	..	21,226	20,703
divided by unpaid labour input, hours	2,893	1,816		2,731		2,286	2,209
= Hourly earnings	-8.51	-8.17	...	3.63	..	9.28	9.37

8.2.2 EconomyDoctor internet services

EconomyDoctor FADN Standard Results service

The EconomyDoctor FADN Standard Results Internet service (www.mtt.fi/eufadn) was opened for public use by the MTT Economic Research in June 2007. It provides the FADN Standard Results of EU member States from accounting years 1989-2004. The figures are based entirely on the CSV-files, which can be downloaded from the public internet site of the EU DG AGRI. G.3. (<http://ec.europa.eu/agriculture/rical/>). The service reproduces the figures in the CSV-files. No additional results have been calculated in the service.

The Internet service generates tables dynamically on the basis of the user's selections. The service contains basic key figures by Member State from accounting years 1989-2004 and financial statements of the Member States from all accounting years between 1998 and 2004. These financial statements include income statement (profit and loss statement), balance sheet, and key ratio report for each Member State. The most flexible part of the ser-

vice consists of reports based on the criteria selected by the user ('Own criteria'). The user can select the report and the classifiers, which are then used to generate the data table. There are nine reports and eleven classifiers to choose from. At least two classifiers must be selected and a maximum of five classifiers can be selected per report.

EconomyDoctor FADN Advanced Results service

The heavy use of FADN Standard Results internet service and also internet service which was published in December 2006 showing results of Finnish agriculture (over 100.000 tables during first half a year period) proves that people wants to compare the results of agriculture of different production types, member states and size classes. They try to find the financial key figures, which would be as useful as possible to be used in these comparisons. In order to help in these comparisons, the new internet service The EconomyDoctor FADN Advanced Results (www.mtt.fi/eufadn-adv) was opened for public use by the MTT Economic Research in September 2007. It provides the FADN Advanced Results of EU member States from accounting years 1989-2004. The figures are based on the CSV-files, which can be downloaded from the public internet site of the EU DG AGRI. G.3. (<http://ec.europa.eu/agriculture/rica/>). In addition to this, extra key indicators have been calculated based on that database. The calculation and interpretation of those indicators have been presented in this paper.

8.2.3 User interface of the FADN Advanced Results service

The FADN Advanced Results service generates tables dynamically on the basis of the user's selections. The service contains three kinds of data tables/reports, which can be selected in different sections of the service.

- Section 1: Basic key figures by Member State as a time series of the accounting years 1989-2004 (user interface in figure 8.1 and output in figure 8.1a).
- Section 2: Basic key figures and their components by Member States from all accounting years between 1998 and 2004. These financial statements include three different reports for each Member State (user interface in figure 8.2).
- Section 3: Reports based on the criteria selected by the user ('Own criteria'). The user can select the report and the classifiers, which are then used to generate the data table (report). There are three reports and eleven classifiers to choose from. At least two classifiers must be selected and a maximum of five classifiers can be selected per report. In figure 8.4 is the allowed combinations of the classifiers. User doesn't have to select all the subclasses of the classifier. They can for example select only certain member states (user interface in figure 8.3 and output in figure 8.3a).

Classifiers

In FADN Advanced Results service section 1 (figure 8.1) user can select key figure and the IT-systems construct a table, which includes the key figure for each Member State from time series 1989-2004.

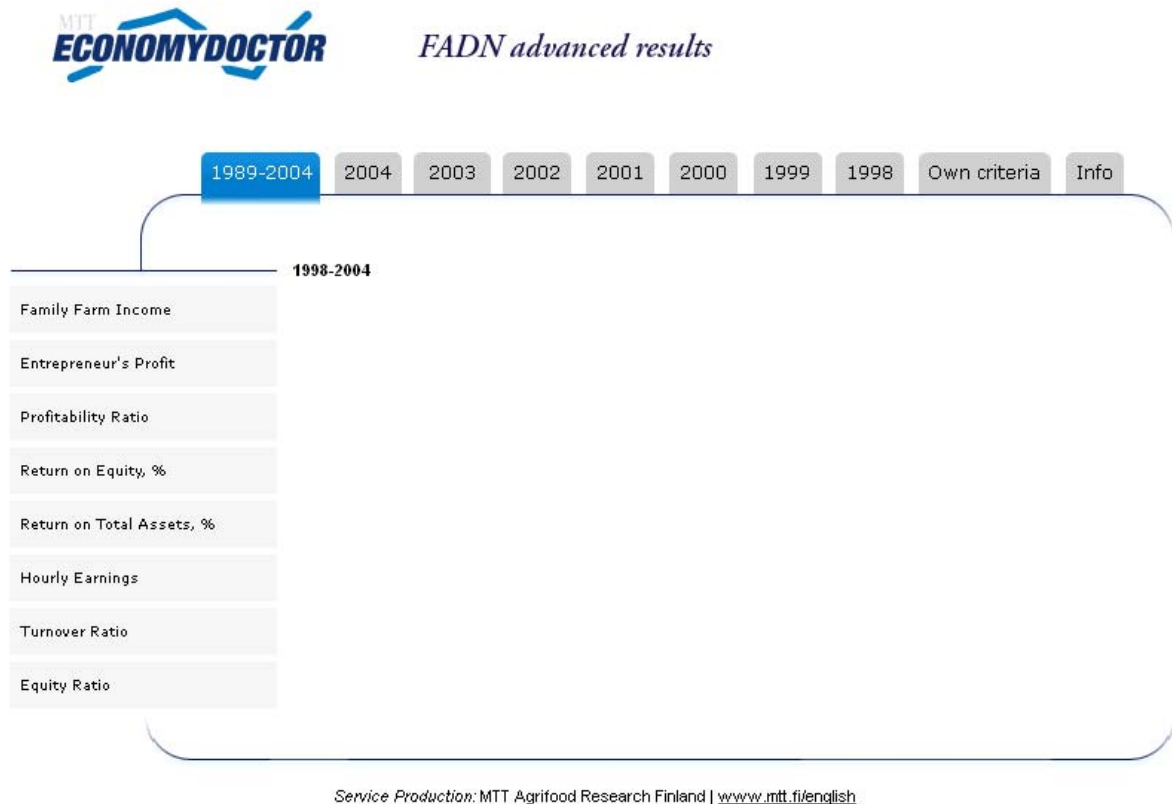


Figure 8.1 User interface of FADN Advanced Results service, section 1

In FADN Advanced Results service section 2 (figure 8.2) user can select three kind of reports, which has different kind of key figures and the basic components of calculation and then the user can select the accounting year between years 1998-2004 (in figure 8.2 accounting year 1998). The IT-systems construct a table, which includes the selected report for selected accounting year for all the Member States.

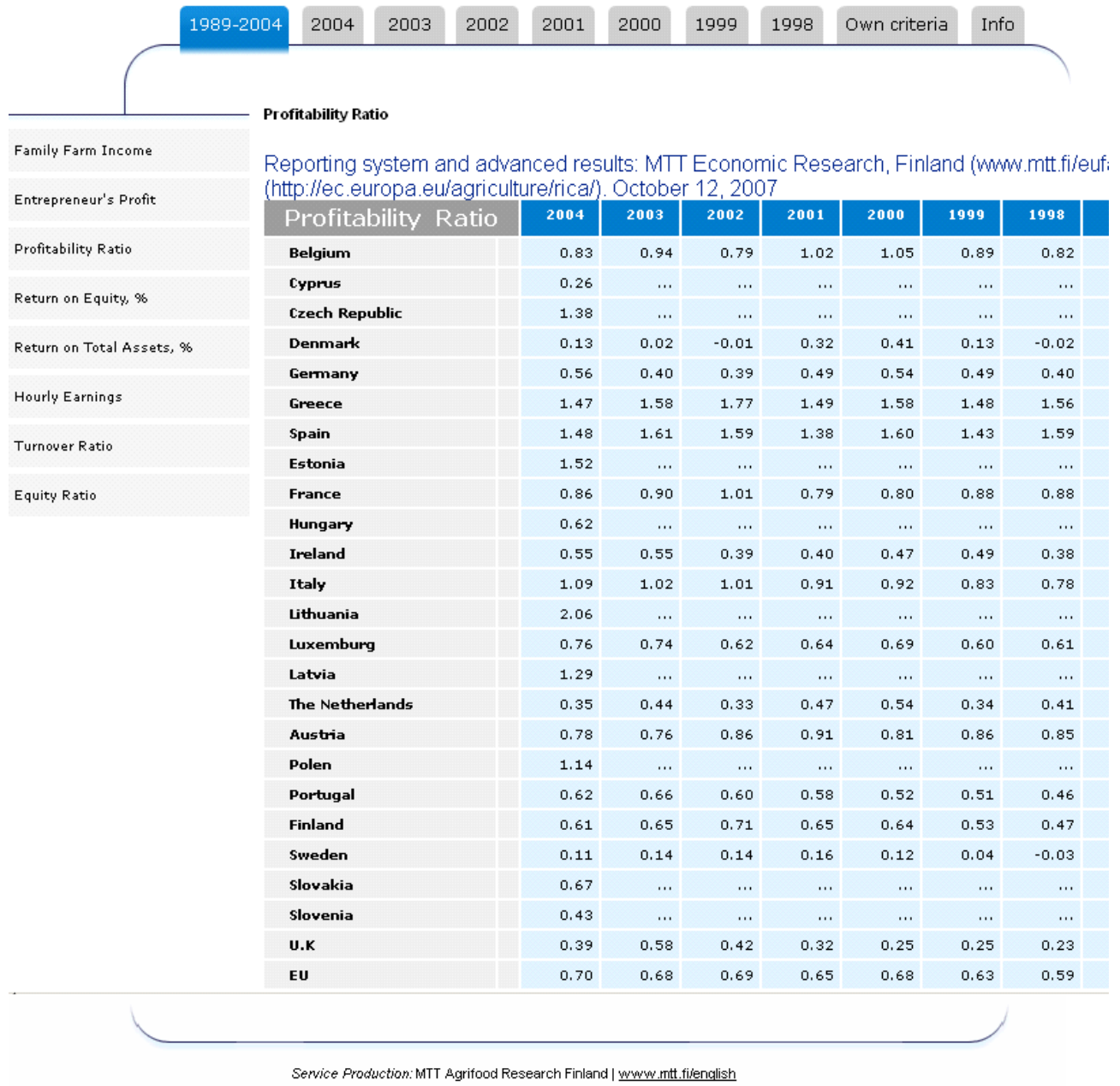
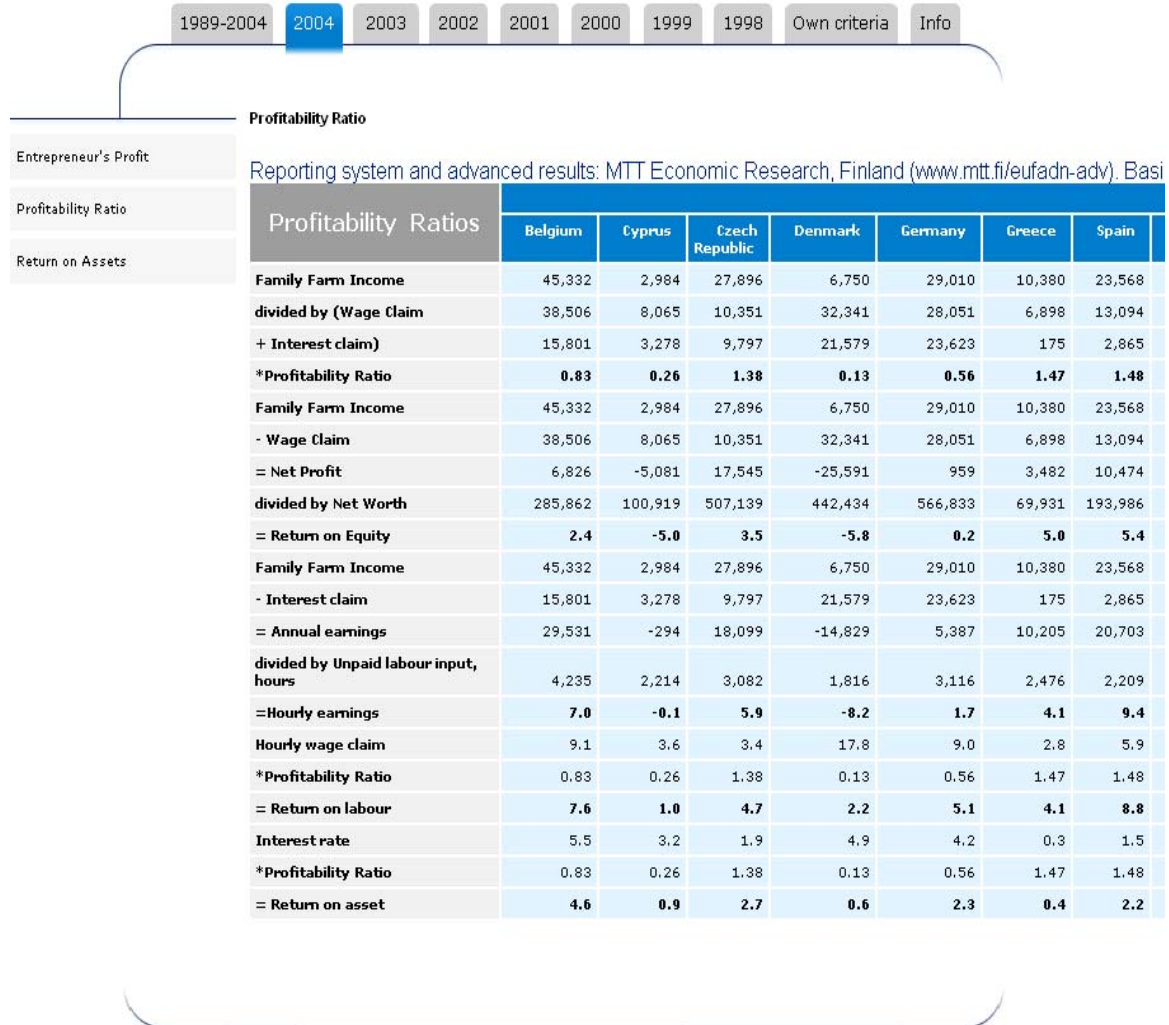


Figure 8.1a A report (part of it) of Profitability Ratio of FADN Advanced Results service, section 1



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

Figure 8.2 User interface and a report of Profitability Ratio of FADN Advanced Results service, section 2

In FADN Advanced Results service section 3 (figure 8.3) user can select one of the same three reports as in section 2. But in this case user can select the classifier of the table. The IT-systems construct a table, which includes the selected report for selected classifiers. In figure 8.3 the user has selected report 'profitability ratio' and then user has selected 'Year' as a first classifiers of the table and in this case just accounting year 2004. As a second classifier the user has selected 'Production Type' and as a subclass milk-production. As

the third classifier the user has selected 'Economic Size' and three subclasses from that classifier. The last classifier selection is 'Member State' and only Belgium, Estonia, Denmark and Finland. By selecting Member state as last classifier, user gets a table where the columns of these member states are beside each other in each class of combination of classifiers. So it is easier to compare results of different Member States. The resulting table can be copied with copy-paste to Excel or some other program for the further use of the results.

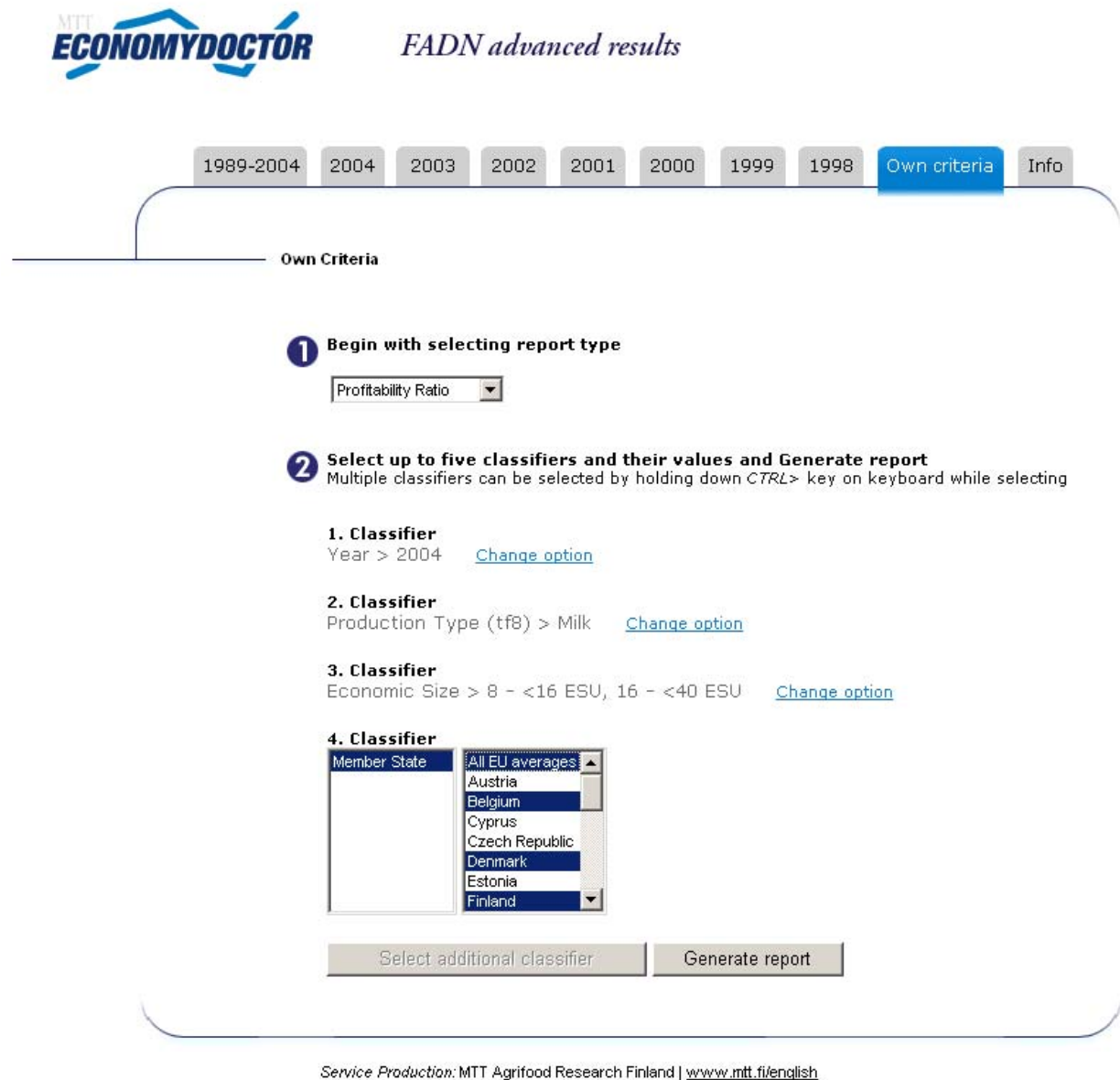


Figure 8.3 User interface of FADN Advanced Results service, section 3

Reporting system and advanced results: MTT Economic Research, Finland (www.mtt.fi/eufadn-adv). Basic data Source: FADN-EC-DG AGRI/G.3. (http://ec.europa.eu/agriculture/rical). October 12, 2007

Profitability ratios	2004										
	Medium low			Medium high			Average in main group			Milk	
	Denmark	Finland	Belgium	Denmark	Finland	Belgium	Denmark	Finland	Finland	EU	
	Denmark	Finland	Belgium	Denmark	Finland	Belgium	Denmark	Finland	Finland	EU	
Farms represented	8,310	11,810	8,570	9,980	20,450	8,010	6,280	16,170	1,140	52,420	
Farms in sample	100-200	100-200	100-200	200-500	200-500	200-500	200-500	200-500	<15	1,000-2,000	
Economic size, ESU	11.8	11.4	29.8	25.4	28.3	77.0	137.7	44.0	...	12.1	
Family Farm Income	-1,931	2,217	17,655	691	19,631	40,009	14,235	32,270	...	10,337	
divided by (Wage Claim	12,762	10,239	27,407	21,280	29,462	40,855	52,316	43,893	...	21,720	
+ Interest claim)	9,697	3,008	8,505	13,497	4,985	15,579	23,852	5,931	...	5,370	
*Profitability Ratio	-0.09	0.17	0.49	0.02	0.57	0.71	0.19	0.65	...	0.38	
Family Farm Income	-1,931	2,217	17,655	691	19,631	40,009	14,235	32,270	...	10,337	
- Wage Claim	12,762	10,239	27,407	21,280	29,462	40,855	52,316	43,893	...	21,720	
= Net Profit	-14,693	-8,022	-9,752	-20,589	-9,831	-846	-38,081	-11,623	...	-11,383	
divided by Net Worth	198,817	108,571	153,863	276,721	179,933	281,836	489,019	214,046	...	153,112	
= Return on Equity	-7.4	-7.4	-6.3	-7.4	-5.5	-0.3	-7.8	-5.4	...	-7.4	
Family Farm Income	-1,931	2,217	17,655	691	19,631	40,009	14,235	32,270	...	10,337	
- Interest claim	9,697	3,008	8,505	13,497	4,985	15,579	23,852	5,931	...	5,370	
= Annual earnings	-11,628	-791	9,150	-12,806	14,646	24,430	-9,617	26,339	...	4,967	
divided by Unpaid labour input, hours	717	1,022	3,014	1,195	2,941	4,493	2,938	4,382	...	3,361	
=Hourly earnings	-16.2	-0.8	3.0	-10.7	5.0	5.4	-3.3	6.0	...	1.5	
Hourly wage claim	17.8	10.0	9.1	17.8	10.0	9.1	17.8	10.0	10.0	6.5	
*Profitability Ratio	-0.09	0.17	0.49	0.02	0.57	0.71	0.19	0.65	...	0.38	
= Return on labour	-1.5	1.7	4.5	0.4	5.7	6.4	3.3	6.5	...	2.5	
Interest rate	4.9	2.8	5.5	4.9	2.8	5.5	4.9	2.8	2.8	3.5	
*Profitability Ratio	-0.09	0.17	0.49	0.02	0.57	0.71	0.19	0.65	...	0.38	
= Return on asset	-0.4	0.5	2.7	0.1	1.6	3.9	0.9	1.8	...	1.3	

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Figure 8.3a A report (part of it) of Profitability Ratio of FADN Advanced Results service, section 3

Classifiers	1	2	3	4	5	6	7	8	9	10	11	12	13
Year	X	X	X	X	X	X	X	X	X	X	X	X	X
Member state	X	X	X	X	X	X	X	X	X	X	X	X	X
European size unit				X	X	X				X			
Production type (TF8)		X			X		X				X		
FADN-region									X	X	X	X	X
Production type (TF14)			X			X						X	
Production Type (A28)								X					
Production Type (A29)								X					
Production Type (A30)								X					
Production Type (A32)							X						
LFA-region (A39)													X

Figure 8.4 Combination of the classifiers.

Conclusions

The FADN serves users by producing several financial key indicators in Standard Results. The main indicators are focusing on farm incomes to provide high comparability in results between farms in the very diversified agricultural sector. In business analysis this may cause problems, because all costs are not taken into account. The growth of farm size and the capital intensity of agriculture raise the importance of total costs and profitability. Including opportunity costs of farm's own factors, labour and capital, the total costs can be calculated. This allows calculating additional economic key figures from the FADN Standard Results. The results presented are indicative of profitability, earnings and solvency of farms in the Member States.

The FADN data is very important and also very expensive data base. It should be used as much as possible in different kind of purposes. Flexible and easy internet service with additional economic key figures has been made in order to increase the utilization of this important FADN data base.

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Mainpage of EconomyDoctor, <www.mtt.fi/taloustohtori>

EconomyDoctor FADN Standard Results <www.mtt.fi/eufadn>

EconomyDoctor FADN Advanced Results <www.mtt.fi/eufadn-adv>

Internet site of the EU DG AGRI. G.3. <<http://ec.europa.eu/agriculture/rica/>>

Workgroup Session 1: Providing FADN data to users

Theme

The use of the data for research is vital for FADN. For a lot of research it has much added value when data of individual farms can be used in the research. On the other hand it is vital for FADN to protect the privacy of the farmers. In most countries farmers participate on a voluntarily base. If they do lose trust in the FADN, the response rates will drop to levels where the chance is small that the FADN will still be representative.

In this workshop we looked at this dilemma. We had a number of examples of requests for individual data. These were discussed in groups and answers were formulated (yes, no, conditions/motivation).

- Group A and B started with the odd numbers
- Group C and D started with the even numbers

Group composition

Group A

Chair: Catherine Moreddu
Reporter: Ann-Marie Karlsson
Members: Marcin Cholewa
Dineke van Zwieten
Koen Boone
Erling Andersen

Group B

Chair: Torbjørn Haukås
Reporter: Liam Connolly
Members: Ester Van Broekhoven
Olli Rantala
Kaspar Muehlethaler
Ted Covey

Group C

Chair: Beat Meier
Reporter: Arto Latukka
Members: Lovisa Reinsson
Eudard Matveev
Sophie Helaine
Jyrki Niemi

Group D

Chair: Hans Vrolijk
Reporter: Maija Puurunen
Members: Dominique Desbois
Brian Moran
Anita Stamnova
Timo Sipiläinen

Examples of requests for individual data

1. A colleague from your institute would like to have individual data for calculating the spread in incomes. He would like to work on this abroad and wants to take the data with him on a laptop.

Group A:

Yes purpose: research, employees, does probably not matter if taken abroad.

Group B:

Yes - employee - sign confidentiality
- remove location: no names/identifier
- can take abroad

2. A colleague from your institute is struggling with his research on factor analysis. He would like to send a file with 10 farms to his former Professor at the University who could help him solve the problem.

Group C:

No - no data without contract
- restricted data (some variables) perhaps

Group D:

No 10 farms 'factoranalysis'! (- not necessary analyse)

3. A Professor of University X has to make a very crucial regression analysis for the Ministry of Agriculture. This research is crucial for getting a 100 million Euro subsidy from Brussels for farmers. The professor is only willing to do the work if he can work on it at home.

Group A:

Yes/(no) purpose, contract, 'might be exceptions', (high policy demands)

Group B:

Yes with conditions/contracts/return data when project completed

4. A student from University X would like to make an analysis of the differences between farms of the cost of production of milk. He is disabled and it is not possible for him to visit your institute.

Group C:

Yes - with contract signed by the professor and student
- check whether individual data is needed
- (no, because user is student)

Group D:

No unless underlying contract

5. A professor from University X has to evaluate the consequences of the CAP on the spread of the incomes of the farmers and the environment. He is using a complex model that can only run on his computer. He also needs the exact addresses of the farmers while he wants to couple the data with ecological data of his own.

Group A:

No (yes) - because identifiable data (addresses)
- install the data at the institute

Group B:

No, but could ask farmers if they agree, then could give addresses

6. A researcher of a commercial research institute has won a tender for a research based on individual FADN data. Your institute also tried to get the research but lost because the director of the other institute is a friend of the Minister of Agriculture. This institute does not have any knowledge of FADN and there is a large chance that they will misuse the data.

Group C:

No legal restriction

Yes close control

Group D:

Yes co-operate

7. The marketing manager of company X would like to use the individual FADN data for a research into the market potential for a new product. He is willing to work in a Microlab context with anonymised data at your institute.

Group A:

No (yes) - because of commercial purpose.
- specific agreement, if publicised
- depends on what is marketed if beneficial to farmers.

Group B:

Yes if fully anonymised

8. A consultant is working on a research for the Ministry of Agriculture and would like to have individual data from FADN. He also wants to have name and address because he would like to interview the farmers.

Group C:

No not possible to give names

Yes if farmer is willing to participate and give signed paper, where he gives his permission voluntary

Group D:

No forbidden in the rules of FADN to give contacts of farmers

9. A researcher from abroad would like to have individual data for a comparison of the competitiveness of his country with your country. He needs the exact location of the farms (address or GIS-code). This research will also be very interesting for your ministry of Agriculture and if you send the data he is willing to send you the report in your own language.

Group A:

No (name and address, GIS)

Group B:

No but or if farmer signs off

10. You rejected the request of the consultant (see example 8). The Minister of Agriculture however called your director and explained to him that this research is very important for the Ministry. He would like you to reconsider your response.

Group C:

No/Yes only if farmer is willing to participate (voluntary bases)

Group D:

No

11. A researcher from abroad would like to have access to individual data of your FADN. In his research he would like to prove that subsidies are misused by farmers in your country. It might lead to a repayment of the subsidies to Brussels up to 100 million Euro.

Group A:

Yes (no) - Theory ↔ Practise
- quality of research project

Group B:

No - as seems to have predetermined outcome
- but some felt should be yes

12. A consultant would like to do research in the market share of Dairy cooperatives. He would like to use individual FADN data for it. He does not need name and addresses.

Group C:

- No - no information in FADN data for market research
- individual data is not needed

Group D:

- No - doesn't need names and addresses

Group A formulated the following general criteria:

- purpose (research/statistical);
- data are not allowed to leave the institute (regardless of the purpose);
- identifiable or non-identifiable micro-data;
- if the result is made public or not;
- in general it does not matter if the request is made by someone from abroad or not.

9. Development of an OECD network to undertake distributional analysis

Catherine Moreddu, Trade and Agriculture Directorate, OECD

Context

In recent years, the OECD has undertaken several projects related to policy reform impacts that have involved the use of disaggregated or micro-economic data. Various approaches were used in these studies in terms of data access and treatment.

A report on farm household income issues (OECD, 2003) looked at the frequency of low incomes in farm households and compared the distribution of support to that of income in selected OECD countries.

- On-line individual income survey data available under the Luxembourg Income Study (LIS) network were accessed and indicators computed comparing the frequency of low-incomes among farm and non-farm households.
- At OECD's request managers of farm survey databases in government institutes generated data for customised groups (quartiles based on farm receipts), on the basis of which the Secretariat computed indicators to compare the distribution of support and income.

Studies undertaken as part of a large project on decoupling estimated the risk and investment effects of different types of payments on farmers' production decisions using micro-data (OECD, 2006a and 2006b). The surveys used here were principally the EU's FADN (for a specific region in Italy) and the ARMS database which is operated by the Economic Research Service of the USDA.

A more recent report (OECD, 2006c) estimated the potential effects of agricultural policy and trade reform on different types of farm and non-farm households in selected OECD and non-OECD countries. For this study distributional analyses based on modelling were carried out by consultants with access to national survey data from official sources (United States) or from their own original research which sometimes included one-off special surveys to collect the data (Italy, Malawi, Mexico). In other cases, consultants were asked to build a new database by merging existing data sources before the analysis could be carried out (Brazil).

A common feature of this type of analysis is the difficulty of acquiring good data and good information. This is the case for several reasons:

- access to micro-level data is not easy, institutionally and technically.¹ This is particularly so for an international organisation like the OECD which ideally needs to analyse many countries simultaneously, on as comparable a basis as possible. Political

¹ The feasibility of accessing micro-data is being assessed by the OECD Statistics Directorate. A Conference was held in Luxembourg on 26-27 October 2006. All of the papers and presentations made at the conference are available at https://www.oecd.org/document/27/0,2340,fr_2649_201185_37502683_1_1_1_1,00.html.

- sensitivity and respect for confidentiality (concerning income data for example) limit access to individual data and the possibility to match-up different data sources;
- regular analysis at a micro-level requires significant resources in terms of time, money and specialist expertise that are not currently available;
 - the quality of existing data is often problematic. Coverage of countries, farm households and economic variables is often uneven and incomplete. There are problems of frequency and timeliness. Panel data needed to look at adjustments over time are difficult to obtain. Comparison with other sectors is often constrained by the small number of farm households in general surveys.

At the same time, the need for good micro data upon which to base the required analysis that would support improved policy decision making is increasingly evident. Many countries are investing more in this area, and for some time now networks of producers and users of micro data have been attempting to address at least some part of the need for better data (examples include the LIS, PACIOLI, the IWG-AGRI Task Force, and the Global Club of Directors of Agricultural Economics Research Institutes). But thus far progress has been limited and insufficient.

As a result, OECD is attempting to establish a Network to Undertake Distributional Analysis within the framework of government statistics and research institutes specialised in this area. The network would include government-related institutions (such as ministries, ERS, ABARE, LEI, INRA) and other agricultural economics research institutes and experts involved either in the collection or analysis of micro-level data and interested in collaboration. Membership would be voluntary and a representative coverage of countries would be sought.

9.1 The proposed network

Objectives

The network would be interested mainly in analyses based on data at the farm household level in OECD countries. Ideally, micro-level data would cover information on farm production structures (e.g. outputs, land and other input use, farm income, investments, debts), farm and non-farm based activities, financial and demographic characteristics of farm households, land use, environmental aspects such as input use or adoption of agri-environmental measures, and production and marketing practices. Agricultural Censuses provide basic information on the demographic and production situation in the sector at given intervals. Annual farm account surveys or databases cover farm production and financial aspects. Other more general sources include tax files or economy-wide surveys on income, labour force or household expenditures, although farm households are not always well-represented in the samples.

The network would:

- identify data availability, including comparison of definitions concerning the economic and financial status of farm households;
- suggest ways to address issues related to definitions and data gaps;
- suggest approaches adapted to the issues identified and actual data availability;
- define the policy issues of interest and encourage development of innovative analytical approaches to them.

OECD-role

The OECD would act as convenor for the network, and would participate in two substantive ways. First, the OECD secretariat would identify policy interests in light of member country views and participate in clarifying the related data and analytical needs (the required 'tools') that national participants in the network might attempt to address. The secretariat itself would not attempt to create data bases, develop analytical tools, nor undertake policy analysis in the context of the network. Rather, it would try to ensure that critical mass is brought to the analysis of the issues that have been agreed as of priority interest and that analytical approaches are as appropriate and consistent as is feasible across the participants in any given project. Second, the secretariat would synthesise the results of relevant analysis, where pertinent, develop policy conclusions or recommendations and present the results to the relevant working parties. Any synthesis reports undertaken by the secretariat would be managed by the Committee and Working Party on the basis of current standard practises (scoping papers, draft documents, declassification procedures, etcetera). The contributions of individual authors or institutions would remain under their own authority but would, of course, be fully acknowledged.

Defining issues to be tackled

The network will function well only if policy questions of common interest are defined and commitments entered into to tackle them through the network. Three-way communication between delegations, experts and analysts in the relevant institutes or agencies and the secretariat will need to be established and maintained for this to occur. For institutions and agencies participating in the network, the opportunity to participate in project development with experts from other countries could be invaluable, leading to improved understanding of mutual problems and greater policy relevance. In the longer term, working together could provide impetus to needed harmonisation or other improvements in definitions or coverage of surveys. For the OECD and its member countries the network will allow analysis of issues of common interest that can only be addressed using complex micro-economic data sets requiring the kind of specific expertise and knowledge that is not usually at the disposal of an international secretariat.

Policy issues of interest in a first phase could relate to the distributional consequences of changes in agricultural and trade policy on farm households by region, by farm type, by farm size and by other parameters related to the financial situation of the households. Linkages between farm households with diversified income portfolios and the rural economy could also be explored in support of the project on the role of farm households in

the rural economy. The network could also contribute to the development of additional policy-relevant indicators, for example by combining structural data with data from the PSE/CSE databases.

9.2 Initial reactions on policy issues

In May 2007, delegates at the Committee for Agriculture were invited to give their countries' view, in particular on the scope of interests to be covered and the medium term policy issues that would most benefit from analysis of micro-economic data through the proposed network. All countries supported the establishment of such a Network, but some delegates outlined problems regarding differences among countries in defining farm households, and the comparability of data across countries. Budget constraints were mentioned as an impediment in collecting micro data probably as an apology for the lack of information and as a warning they do not intend to collect more data for the OECD. As intended, there was no discussion on the practical organisation and functioning of the network. We asked countries to send us the name of contact persons who would be interested in participating in the network and would discuss such issues.

The Committee for Agriculture suggested they would be interested in the network to identify:

- the drivers for improvements in competitiveness and productivity; and
- the distributional impacts of policy reform on the well-being of farmers, farm and rural households.

The OECD also organised a focus group meeting where we presented the new methodology for estimating producer support. We asked participants their views on possible new indicators. There was a lot of interest for the proposed development of indicators of the distribution of support. This is an area where the network could help.

9.3 Future steps

We will start visiting contact persons and experts to get their views. Once we have a sufficient number of countries represented, we will organise a meeting of contact persons to discuss the set up and operation of the network, potential analytical questions to be tackled and data availability, as well the approach to be adopted overall. At some stage, commitment will then be sought from members, based on a more formal proposal.

Regarding policy questions that the network could address, the initial focus will be on short term issues that can contribute to the current programme of work (2007-08) such as the level and composition of farm and rural household income, the diversification of activities within farm households, or the distribution of support. In the longer term, the network is expected to help define projects for the next programme of work, for example on competitiveness or impact analysis.

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10. The net value added approach as a tool for integration at the micro level

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Abstract

There are major changes in the structure of farms and farm households, the levels of enumeration in agricultural statistics, and in the linkages between these levels. To record and enhance understanding of these developments this paper proposes use of a net value added (NVA) approach at the micro level to reflect the participation of a wide variety of stakeholders in the organization and output of farms. NVA is widely used and internationally standardized. NVA concepts can be applied at the micro level to show to which stakeholders the income of the farm is distributed. We show in the paper that stakeholder involvement and distribution of NVA differs among countries, based on economic opportunities and institutions. Being aware of such differences is relevant in the international policy context because many policies involve distributional impacts, particularly for income and wealth. Based on results, we present an agenda for future work to promote the international integration of micro economic statistics in agriculture.

10.1 Introduction

There have been major changes in the structure of farms and farm households, the levels of enumeration in agricultural statistics, and in the linkages between these levels: some farms support more than one household, households have several farm and off-farm income sources and some farms are incorporated together in one company or are engaged in contract farming. To record and enhance understanding of these structural developments, this paper utilizes a net value added (NVA) approach to the measurement of output and income at the micro level. Over the last few years we have developed micro-economic approaches to record NVA and its distribution in the EU, USA, and Canada. A logical next step is improved international integration of these data sets.

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NVA and its distribution have important advantages for understanding the farm sector's contribution to national economies in the broadest possible terms and for providing a basis from which to assess the contribution of all factors of production within the farm sector, regardless of ownership (Strickland, 1992). Value-added reflects the net value of goods and services generated by farms, accounting for total production, whether sold or consumed within farming as food, feed, or seed. Value-added and income are alike in this regard. The difference is that value-added encompasses the contributions and earnings of a larger block of stakeholders and resources than net income (in the EU labelled as: family farm income). Thus, value-added can be considered as the value produced by a larger 'team', including non-operators. A simple accounting equation illustrates the relationship between value-added and net income:

$$\text{Value-added} = \text{Payments to Stakeholders (employee compensation, rent, contractors fee, interest to lenders)} + \text{Residual Net Income.}$$

Value-added estimates enhance information about farms or the aggregate farm sector drawn from traditional measures of income through provision of additional insight about the organizational and operating structures of farms as revealed by stakeholder payments. Data on the distribution of NVA can be used to make comparisons: between farms with a different organizational and juridical structure (family farms, limited companies, co-operatives etcetera) and hence between countries with a different structure of farms. This is relevant for users in international agricultural policy. In extension and farm management it might help to think about strategic management of the business (Porter, 1987). For statisticians it might help to explain differences in survey integration.

10.2 Literature review

The need for microeconomic data to support comparative analyses has long-standing acceptance. Hathaway in the 1960's, for example, noted that two major purposes of comparative income data were to provide economists and policy makers with information regarding resource allocation in the economy and to support analyses of comparative welfare (Hathaway, 1963). This implies a need for more detailed information on relationships between individuals, resources they control, and their incomes. In a similar vein, Schertz (1982) indicated that farm structure issues relate to many aspects of the farming industry including, 'the way that resources are organized and managed in farming and the distribution of income'. Recognizing greater heterogeneity in the organization, ownership, and management of farm resources, Schertz called for movement away from data geared to an individually controlled farm concept to a data model that recognized separation of resource ownership and use. Baum and Johnson (1986) incorporated the heterogeneous nature of the farm sector into their argument that use of aggregate data to assess the economic condition of the farm sector, 'could preclude a quantitative understanding of how changes in output or input levels, technology, price, or policy may affect or be affected by different types and sizes of farms within regions'. Vogel and Johnson (2000) in addressing the implications of changes in farm structure for income measurement and data collection noted that changes

in business arrangements and production and marketing practices make it necessary to address measurement problems to have confidence in the levels of income developed for public use. In a more recent recognition of the need for microeconomic data in farm policy analyses, Hill (2000) as well as Offut (2002) and Morehart, et al. (2004) argued that micro-level analysis is necessary in order to understand the distributional implications of policy. Canada recently (March 2007) had a farm income workshop to examine its farm income indicators. One major concern was that macro-farm income measures were become a poorer indicator if the state of agriculture in Canada becomes more complex. The workshop recommended the increase use of value added as well as more emphasis of farm level micro data. Poppe et al. (2004) arrived at a similar conclusion. He argued that in a 'tradition of reframing our concepts of the family farm:'

'we need to update our references of the farm and its relation to farm households, as farms in Western Europe would show much more complexity in farming than older models. An assessment of data for farms leads to the conclusion that a 'farm' is, nowadays, a complex notion.' (Poppe et al, 2006).

The OECD (2003) made a first attempt to provide international policy makers with micro economic income data. These studies highlight conflicts between structural change in agriculture, data collection, and its use in statistical reporting and policy analysis. The crux of this conflict is recognized by Garder (1975) in his argument that the demand for statistics is, 'derived from the demand for knowledge'. The needs for data change in response to economic and other events. Demands on the data system change. Gardner advocated a more flexible system and he argued that, 'adaptability is enhanced by having statistics available for micro units and for micro concepts.'

10.3 The Net Value Approach to Measurement and Analysis

NVA is widely used and internationally standardised. Typical portrayals of a value-added account show final value of agricultural output where output is usually presented for crops, animal output, and some miscellaneous items that include services, forestry and other items related to the farm holding (figure 10.1). From this amount intermediate consumption is subtracted, leaving an estimate of gross value at market prices, or the margin generated from farming over inputs purchased from other sectors of the economy. Net government transactions are then added and depreciation subtracted to yield an estimate of net value-added for the 'holding'. At the sector level, agriculture is typically accepted as one 'holding', a sector of the national or regional economy. Further adjusting the estimate of net value added for compensation of employees and payments of rents and interest moves the account to an estimate of operating surplus and net income from agriculture (often labelled Family Farm Income in Europe, a term that reflects the classical thinking of family farms). Constructing estimates of value-added for use in deriving net income estimates leads to consideration of returns to factor providers. Some factor providers earn payment through agreement or contract while others share business risk. The factor providers who share business risk are the recipients of the net income from agriculture, as a reward for their la-

bour and capital input and their risk taking. The types of individuals and entities that might share net income from agriculture would differ among countries (and farms) depending on the business arrangements, legal forms, and other customs accepted for use.

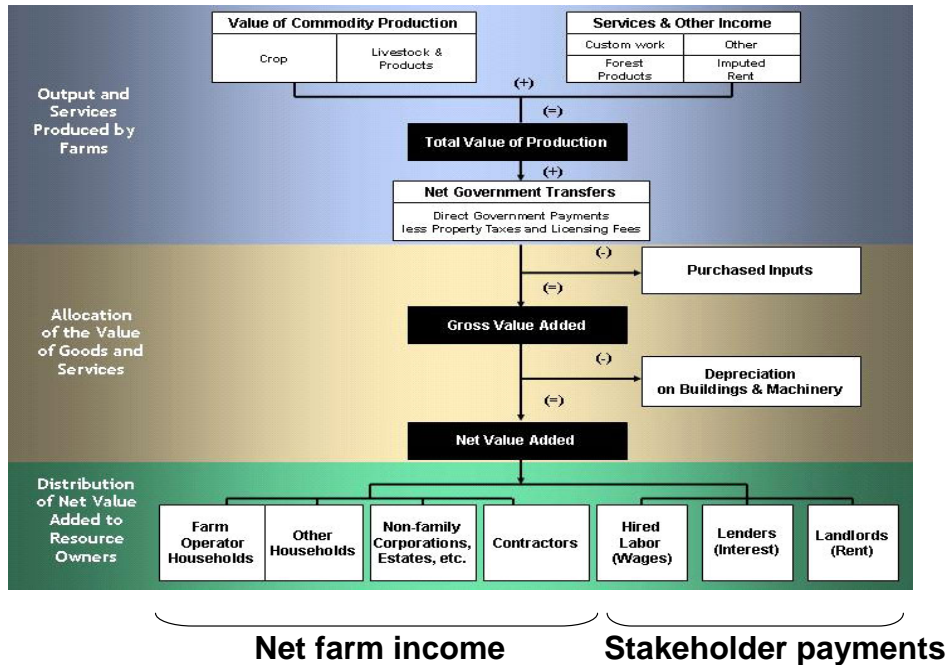


Figure 10.1 Value added framework gives broadest measure of farm resource providers' contribution to economy

If a holding has only one owner and operator, the net income from agriculture would flow to the owner/operator's household as a return to the factors of production provided by the household. But as is the case for many farms, multiple owners and operators may be engaged in the business. In this case some arrangement for allocating the farm's operating surplus or net income exists. At the level of the farm household(s) the share in net value is often supplemented by other sources of income (that is a share in net value added of other parts of the economy or transfer income). Many households choose to use labour and financial capital to develop off-farm businesses that provide additional self-employment opportunities for household members. In these cases, farm households share in the value-added generated in non-farm sectors of the economy.

Sector aggregate accounts often do not provide information on all these distributional aspects of agriculture. NVA concepts can, however, be applied at the micro level to show to which stakeholders the income of the farm (or holding) is distributed. Employing this concept through the use of micro-level data enhances the ability to recognize where value-added is generated within agriculture and how agriculture's operating surplus and income is distributed to owners of factors of production and their different households.

If statistics would only focus on an enterprise, the complex arrangements in today's farms would be missed as many of the largest farms have many activities and profit centers. If the focus would be on the farm/firm, the many business-to-business interactions, like contract farming, joint ventures etcetera would be missed. Income sources for rural households that mainly provide labour (on large scale operations in vegetables or reformed cooperatives in Eastern Europe) or the multiple households from the farm owners would go unreported. A focus only on the household's income or wealth for a selected farm operation would miss the household dynamic that includes saving and investment across multiple enterprises and activities. And would not show how well the farm competes with alternative economic activities, perhaps outside the farm sector, for the household's resources, which is a major indicator for competitiveness. The value added framework with its emphasis on capturing total output, total input use, and stakeholder engagement in the farm provides a strong basis from which to undertake distributional measurements and analyses.

10.4 Farm Definitions and Farm Structure: Differences among Countries

Definitions of the farm and lower limits on 'qualification' make the problem of integration more difficult. Not only do countries have differences in how farms are organized and operated, they have differences in what is considered a farm. EUROSTAT defines a farm as: a single unit both technically and economically, which has single management and which produces agricultural products. Other supplementary (non-agricultural) products and services may also be provided by the holding. There are two types of critique of this definition and data. The first is that it is relatively broad for a business statistic and includes businesses and persons (like pensioners) who earn their main income from other sectors. The second critique is that in some cases the definition is not very well applied. For instance in the Netherlands it is not uncommon that a farmer owns more than one holding (on different locations, sometimes with a different juridical structures) that are included as separate farms in the census. Moody (2007) presented similar experiences for the UK, where contract farming has become important.

In the US, a farm is defined as 'any place from which \$1,000 or more of agricultural products were produced and sold, or normally would have been sold during the year,' (NASS, 2007). Like in Europe this includes a diverse set of operations that range from farms with very little annual product and sales to businesses that generate multiple millions of dollars in sales. The National Agricultural Statistics Service (NASS) reported that 17% of farms in the 2004-2005 timeframe were 'point farms'-they had no sales and qualified as a farm based on the fact that they had enough output of some sort that they could have generated \$1,000. Meanwhile, the largest 2% of farms, those with over \$1 million in sales, generate nearly half of all farm value of production. Like in Europe, it is much more common for these large farms to feature more complex organizational structures, such as being organized as company farms or utilizing some form of shared management. While the economic portfolios of households associated with large farms may be more dependent on the farm for sources of income, these large farm units typically have more stakeholders engaged in the business than smaller farms (Johnson and Morehart, 2006). These stakeholders obscure farm-household relationships with regard to the ownership and control of

assets and the distribution of output and income (Morehart et al., 1996; Bartholomaeus and Hardaker, 1981).

Canada also has many sources of farm level data that illustrate the complexity of farms and farm households. Results from the 2006 Census of Agriculture indicated that Canada had 38.5% of the farms with sales of Can\$1-\$24,999 accounting for 2% of sales while farms with Can\$1 million and over in sales accounted for 2.6% of farms and 39.7% of production. Contract farming is becoming a more important production system in Canada as in many other countries.

10.5 Data sources

We used three well-known micro-economic data sets to show that international integration of micro economic statistics in agriculture is feasible and useful. These data sets support analyses at multiple levels of measurement-sector, farm, household, and individual. Composite sector-wide measures mask the distribution of income to stakeholders in farms and the farm sector. Farm-level data address this sector-wide shortcoming by measuring the number and participation of individuals and legal entities in farm businesses. In addition they make it possible to provide this data for different groups of farms, e.g. at the level of regions, farm types, size classes or income classes.

The Agricultural Resource Management Survey (ARMS) provides information on a stratified random sample of farms for the US. The sample of over 34,000 holdings is designed to represent all types and sizes of farms that fit the official USDA definition of a farm, which places it on the same footing as the Census of Agriculture. ARMS is a sample stratified by size of business and farm type groupings. The survey has three parts. The first part is to identify records from a list of farms that features attributes of interest. From this sample units are assigned to a phase of the survey. The second phase is used to collect field-level data for crop enterprises on production practices and chemical use. The third interview phase includes good responses to phase II plus sample selected to provide a more in-depth inquiry into whole-farm economic, finance, and management, along with information about farm operators and the primary operator's household.

The **Farm Accountancy Data Network** of the European Union (FADN) gathers, since 1965, accountancy data from farms for the determination of incomes and business analysis of agricultural holdings. Member states are obliged to deliver data in a harmonized way. Currently, the sample covers approximately 80,000 holdings. They represent a population of about 5 million farms in the 25 Member States, which account for more than 90% of the total agricultural production of the Union. These are labelled as 'commercial farms'. All member states have a lower size threshold for selecting farms but this threshold differs between countries from 2 ESU (€2,400 of gross margin) to 16 ESU. The information collected for each sample farm refers to physical and structural data, such as location, crop areas, livestock numbers, labour force etcetera, as well as to economic and financial data. Net Value Added has been a central indicator (next to Family Farm Income) from the start of the FADN. Off farm income data of households involved in farming is not assembled in the EU-FADN (for which the EU has been criticized by academics (Hill, 2000) and the

European Court of Auditors (2003), but many countries have data available on national level.

Canada also has many sources of farm level data that illustrate the complexity of farms and farm households. Canada undertakes a Census of Agriculture every five years, which provides information on farm expenses and revenues. The Census is also linked to the Census of Population to provide income information on farms households. Under a joint project between Agriculture and Agri-Food Canada and Statistics Canada detailed farm financial data is produced based on tax records and the Farm Financial Survey (FFS). The FFS collects data on farm income, farm balance sheet and farm investments to provide a complete picture of the financial situation of the farms in Canada. Family income is also collected for the major farm family operating the farm. Farm tax data provides detailed revenue and expense data by farm type and farm size. The tax data also produces farm family income estimates by farm type and size. Currently both these data sets cover farms with sales of CAN\$10,000 and more.

The lower threshold of the three data samples we use, differ. It is lowest in ARMS (USA) with \$1,000 of sales. The thresholds for Canada (Sales of CAN\$10,000) and the EU's FADN (Standard Gross Margin of at least €2,400 and often much more) are much higher and not comparable. Here is a clear issue for future work on data integration. A first attempt is made in this paper by looking to quintiles. One should also note that in analyzing data on the distribution (in %) of NVA to stakeholders, the effect of small farms on the average distribution is probably rather limited. A comparison of average income per farm would be much more problematic.

10.6 Results

Distribution of NVA at the sector level

The distribution of net value added to the stakeholders as shown in the national accounts at sector level provides a reference point for our work on integration, as these calculations are largely harmonized by statistical standards (table 10.1). Average net value added per farm has been calculated by dividing the NVA in the sector by the number of farms. This implies that the average NVA per farm is heavily dependent on the lower threshold that counts the number of farms. International comparability is also dependent on the definition of a farm. This underlines our argument that there is a need to complement macro data with micro data on distributions.

For the US and EU contractor stakeholder group is not identified separately, but the earnings of contractors are included in the aggregate estimate of NVA. Data from Canada show that this stakeholder group is indeed important - at least for that country, where more than 8% of NVA is distributed to contractors.

The distribution of NVA differs between countries (table 10.1). Some interesting results appear. In Canada and the US a much larger share of NVA is paid out to banks and other lenders than in the EU. Landowners also take a bigger slice of the cake. In the US labour is a less important stakeholder than in Canada and the EU. As a result farm operators in the EU and US retain about 60% of NVA. In Canada this share is lower. This partly re-

flects the B.S.E. crisis in Canada during this time period that significantly impacted on Canadian cattle producers. In the EU Denmark stands out, where nearly 50% of the added value is paid to the banks. Danish farms are heavily indebted, which is related to its institutions in inheritance and tax. Only 10% of the NVA results for farmers. In countries like Germany, Denmark, Luxembourg and Sweden, a large part of NVA is paid for rent. In some countries this is caused by the large part of agricultural land that is rented (for example Germany) while in others this is mainly caused by the relatively high rent per ha (Denmark). In countries like the Czech Republic and Slovakia where nearly all land is rented, rent per ha is so low that it is still a relatively small part of NVA. In countries where average farm size is small, farms sometimes have a subsistence character and are less mechanized, and the residual income is a larger percentage of NVA. Bulgaria, Romania, Latvia and Poland are examples. In countries where (reformed) large cooperatives are an important form of organization (e.g. Czech Republic and Slovakia), a large part of the added value is paid to employees.

Table 10.1 Distribution of net value added to stakeholders at the average farm, selected countries, 2004, derived from national accounts

Country	NVA in 1,000 \$ per farm per year a)	NVA in a % of total output	% of NVA distributed as ... to.....:				
			interest to banks and other lenders d) (%)	rent to land owners (%)	income to contractors b) (%)	wages to labour (%)	residual net income to farm operators c) (%)
US	61.2	45.5	10.2	7.7	n.a.	15.9	66.2
Canada	39.0	24.3	24.6	11.8	8.4	23.8	31.5
EU-27	11.2	39.1	6.2	5.7	n.a.	24.3	63.8
Belgium	46.4	29.4	13.8	8.7	n.a.	18.8	58.7
Czech Rep.	26.3	26.8	2.3	8.3	n.a.	61.8	27.6
Denmark	52.8	24.2	52.1	12.9	n.a.	33.8	1.2
Germany	38.4	28.9	8.5	14.9	n.a.	25.8	50.8
Spain	28.0	61.9	4.0	3.5	n.a.	13.4	79.0
France	43.2	33.3	4.3	9.1	n.a.	28.6	58.1
Italy	12.7	43.2	4.1	2.1	n.a.	33.1	60.8
Hungary	3.6	34.3	6.2	6.3	n.a.	31.3	56.1
Netherlands	78.8	26.6	15.1	0.7	n.a.	42.5	41.6
Sweden	23.6	26.6	18.0	17.0	n.a.	25.5	39.5
UK	39.6	36.8	8.4	4.0	n.a.	32.3	55.2

a) For EU calculated as total NVA (minus taxes and including subsidies) 2004 divided by the number of farms in 2003. €1 = \$1.24; Can\$1 = \$0.77; b) Contractors are agri-businesses in the food chain (e.g. feed companies, processing industry) that hand out production contracts to farmers in such a way that also these agri-businesses realize net value added in primary production, e.g. by owning the cattle. Custom work is included as a normal business expense and value added in this is not taken into account. These definitions also apply to the following tables; c) Farm operators is operators and unpaid household labor; d) Interest paid minus interest received. Interest received is not available in some countries but is small in comparison with interest paid in most countries. For the US, land-owners include only non-farming landowners.

Sources: National accounts; EU: Economic Accounts of Agriculture.

Distribution of NVA at the micro level

Data integration between the macro and micro level requires that micro-economic datasets provide a comparable picture as the national accounts. Table 10.2 provides the data as presented in the national micro economic databases. A comparison between table 10.1 and 10.2 shows that, in general, the same picture evolves, which supports our working method. For instance, in table 10.2, Denmark also shows a very small share of NVA distributed to residual income for farm operators. And, in Belgium this share is in both tables larger than in its neighbouring country the Netherlands.

Absolute net value added per farm is considerably higher in the micro-economic datasets than in the national accounts for all EU countries with the exception of Portugal. This could be due to differences in reference period (2004 versus '2003') and to differences in the definitions of indicators (Boone et al., 2002). A very important cause is however the fact that the FADN refers to commercial farms only. This suggests that the national accounts/accounts for agriculture could overstate the farm income problem if averages per farm are used as an indicator of performance. As do averages from micro economic data sets with a low threshold.

Table 10.2 Distribution of net value added to stakeholders at the average farm, selected countries a), average 2002-2004, NVA definitions as used in national micro economic information systems

Country b)	NVA in 1,000 \$ per farm per year	% of NVA distributed as ... to.....:				
		interest to banks and other lenders (%)	rent to landowners (%)	income to contractors (%)	wages to labour (%)	residual net income to farm operators (%)
US	48.7	9.1	9.9	12.0	18.0	51.0
Canada	34.4	24.8	12.5	8.8	23.7	30.2
EU-12	34.0	6.8	10.4	n.a.	16.9	65.9
Belgium	73.4	12.8	9.6	n.a.	10.0	67.6
Denmark	65.5	51.6	13.7	n.a.	30.6	4.1
Germany	59.8	9.6	20.4	n.a.	26.2	43.8
Spain	29.9	0.9	3.6	n.a.	13.2	82.3
France	54.2	8.4	18.1	n.a.	17.7	55.8
Italy	30.6	0.7	4.7	n.a.	14.6	79.9
Netherlands	100.0	22.5	11.1	n.a.	30.6	35.8
Sweden	31.7	27.1	22.5	n.a.	26.0	24.4
UK	82.2	8.2	14.0	n.a.	31.3	46.4

a) Data are not (yet) fully comparable due to differences in thresholds of samples and differences in valuations. Data for the EU based on a constant sample of farms, Canadian data based on an average of the results for the three individual years; For the USA based on an average of the individual years 2003-2005; b) New EU member states not yet available €1 = \$1.09; Can\$1 = \$ 0.71.

Sources: US: ARMS, EU: FADN, Canada: FSS.

There are, however, also some differences in the allocation of NVA between table 10.1 and 10.2. In nearly all countries the share distributed as residual net income to operators is different between the two data sources. In some cases it is considerably higher in micro data (e.g. Italy: 80% instead of 68%), in others it is much lower (e.g. Sweden 24% instead of 40%). On micro data the US and EU are more different from in the national ac-

counts. The differences in time period between the two tables and the absolute level of NVA, but also differences in definition could play a role. The share of NVA distributed to labour for instance differs in a number of countries quite sharply (e.g. Netherlands, Finland). In some countries a much larger share of NVA is also distributed to landowners in micro-economic datasets (e.g. Germany, Sweden). We conclude from this analysis that applying the NVA concept in the macro and micro datasets result in data that are close enough (e.g. Luxembourg, Denmark) to try to integrate them and use the datasets as supplementary, but that also more work is needed to investigate methodological differences.

Comparing Canada, the EU and the US, table 10.2 also shows that the distribution of NVA over the stakeholders differs between the EU, US and Canada. Hired labour and banks are more important in Canada. Also in the US lenders take a bigger portion of NVA than in Europe. The share of NVA that goes as a residual to the operators of farms is clearly lower in the US than in the EU, and it is lowest in Canada in this time period - making it more similar to the Netherlands or Germany. The income to contractors is substantial in the US and Canada, and unclear in Europe.

Differences in distribution

The most important advantage of micro-data is that it makes a drill down possible from the national average to groups of farming that represent certain regions, size classes and farm types. That also supports international integration of statistics. It makes differences between countries (also on the national, aggregated level) easier to understand, e.g. by disaggregation to size classes. It also can help to overcome differences in the lower threshold of data samples.

Based on our micro-economic datasets we prepared tables on the distribution of NVA for each country for the distribution of farms into quintiles. We choose NVA instead of output or sales as a criteria for farm size as this reflects best how much farms contribute to the (agricultural) economy. Figure 10.1 provides the results for the different quintiles for a selected number of countries (US, Canada, EU-12, France, UK and Spain). The well-known fact that incomes are very skewed in agriculture is also shown here. The 20% of the farms with the lowest NVA often have a NVA that is close to zero or negative. It is for this reason we used a constant 2002-2004 panel for the EU to calculate average NVA. For the US and Canada this method is not available and we had to take 2005 data. Very low or even negative amounts for NVA lead to extreme percentages in the distribution of NVA over the stakeholders, especially for the residual income from farming.

Although there are interesting differences between countries, the general impression from figure 10.1 is that on median sized farms a relatively high proportion of NVA remains with farm operators as a residual income. Smaller and larger farms tend to share relatively more of their NVA with outside stakeholders. On large farms a higher percentage of (a higher) NVA is paid out as wages. The data for France and the UK clearly show this effect. On small farms the fixed payments to landowners and banks take out a relatively larger share of the NVA-cake, with the effect that the residual income takes a smaller share. Figure 10.1 suggests that differences, and perhaps also competition, within countries are larger than between countries.

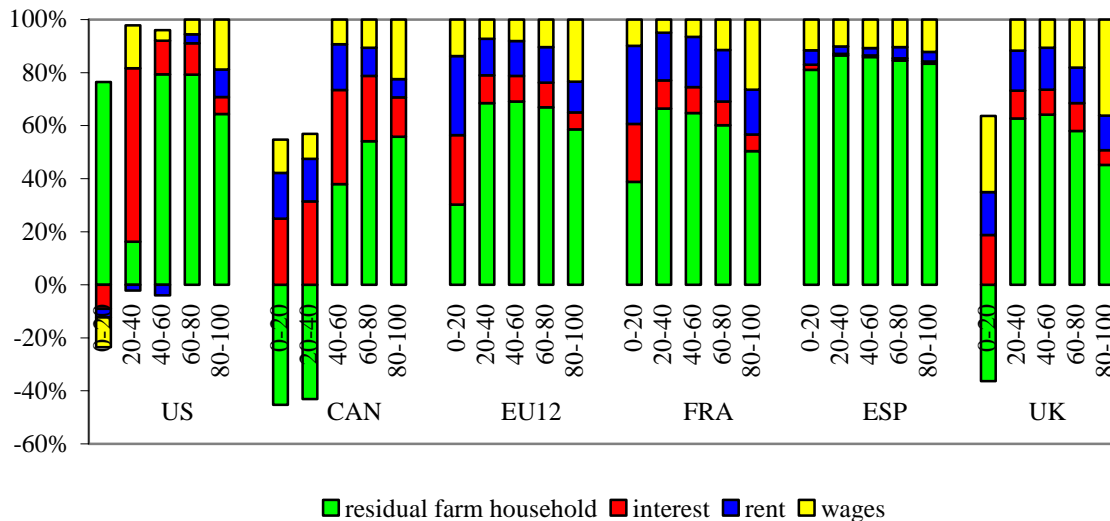


Figure 10.2 Distribution of net value added to stakeholders for quintiles of farms grouped to their average Net Value Added, different countries (EU, France, Spain and UK constant panel average 2002-2004; US and Canada: 2005), NVA definitions as used in national micro economic information systems (for Canada fees to contractors are included in the residual income)

The break down to size classes makes it possible to improve the international comparison. As argued above the thresholds of the micro-economic data sets are not harmonized, which hampers international integration of statistics. Graph 2 compares the distribution of NVA for the groups of farms that make up the fourth (60-80%) quintile. We think the two quintiles with the best NVA are most interesting for international comparison and farm policies, as they are responsible for the lion's share of production and have the best viability – which means that they will also be the farms of the future. However the results in the top quintile can be influenced by outliers and upper thresholds in the samples and by special structural characteristics in some farm types in some countries (e.g. large wine or vegetable growers in California). We therefore focus on the fourth quintile and compare this with the average. Graph 2 shows that the distribution of NVA in the fourth quintile is also quite different among countries. The order of the countries (sorted in both panels on the average share of residual income in NVA for all farms) is not much influenced within the EU, with Sweden as an exception. However the comparison between the EU and the USA leads to different conclusions for the average (EU operators have a larger share in NVA than in the USA) and the fourth quintile (US farmers have a larger share). It shows that for an international comparison averages (and aggregates) can be misleading with different structures and when different thresholds of samples are used.

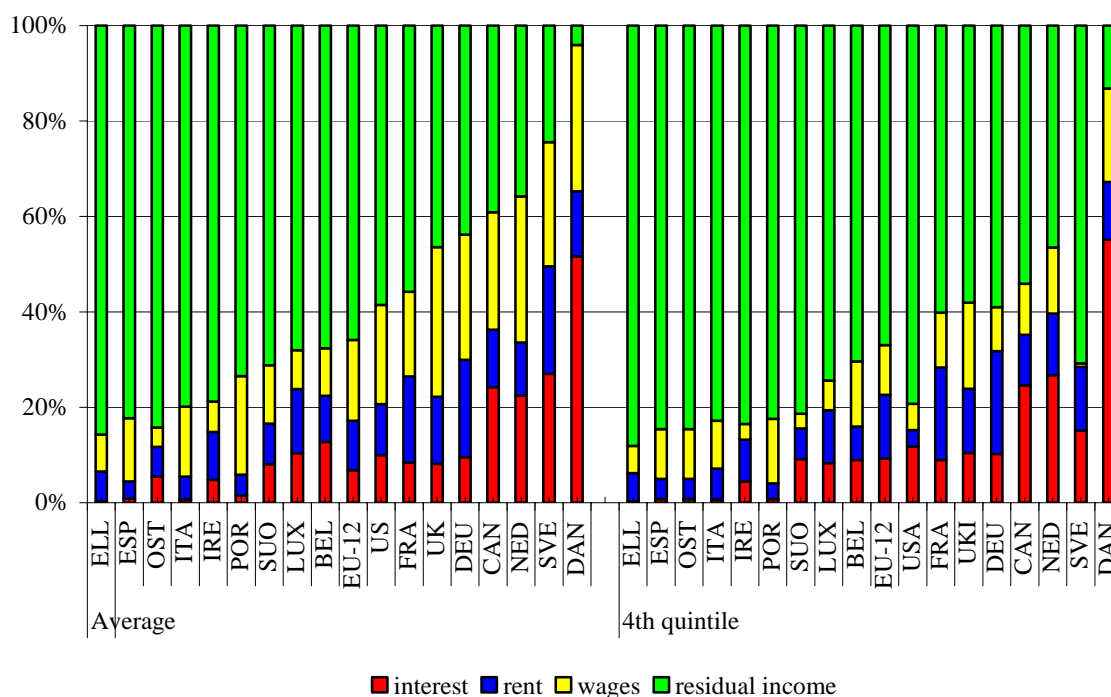


Figure 10.3 Distribution of net value added to stakeholders the average farm and the fourth quintile of Farms when grouped to their average Net Value Added in dollars, different countries; years and data as in figure 10.2; countries in both panels of the graph sorted in descending order to the share of NVA available as residual income for the farm household on the average farm (left panel)

10.7 Agenda for future work

The international integration of micro-economic statistics has a long way to go, compared to the work done at the macro level in the national accounts. At macro level NA 93, its 2007 version and Eurostat 97 form the basis for international comparison that are used within the national accounting framework worldwide. Differences are sometimes introduced when policy departments within various countries, in attempting to monitor policy programs in place, start to change, adapt and generally deviate to meet their specific needs. At micro-level such international integration is just starting up. A first step has been undertaken with the publication of the Wye Group Handbook (UNECE, 2006). The importance of this work (to which OECD, USDA-ERS, FAO, the World Bank, UNECE, Eurostat and the Pacioli-Network contributed) has been recognized by the United Nations by giving this group the so-called 'City Group' status.

Based on our experience we see the following issues to explore for further harmonization as most pressing:

- treatment of taxes and subsidies. NVA can be calculated at factor cost or market prices and our samples are probably not harmonised on this point. As agricultural support mechanisms, including direct payments, differ between countries and over

time, this is an important issue for further harmonisation. It seems most attractive to include all such payments in the income and NVA of the farm business, also as a separation between subsidies/direct income payments and payments for environmental/public services is hard to make. But this would be different from the national accounts;

- treatment of costs of farm houses. These are sometimes included in the costs of the business (and lower NVA), where in other countries costs are on the household budget, or an imputed rent of the farm house as a business revenue is taken into account;
- other differences in accounting principles. This could for a large part be solved if IFRS (International Financial Reporting Standards) would be used as a standard. That means for example the use of fair values for biological assets and stocks at balance sheet date and inclusion of differences in fair value in the added value;
- thresholds of surveys and different typologies could hamper international integration;
- based on these very first results of an international integration of micro statistics, we think this work can be broadened to adjacent areas. Based on our experiences, we think this would be policy relevant and possible for the following topics:
 - time series;
 - data on certain key sectors like dairy or cereals;
 - data on farm subsidies and distributional aspects;
 - data on households, their net farm (family farm) income and their income from other sources;
 - data on net-equity invested in the farm and total wealth, also to assess return on investments;
 - data on viability of farms and households (to assess financial stress), especially for sectors undergoing policy reform;
 - more data on inputs, especially factor inputs to analyse efficiency and competitive advantage;
 - effects of changes in energy and product prices (e.g. effect of 10% change of energy price or milk price with unchanged behavior on income and viability).

Persons and countries interested in this agenda are invited to join this future work.

10.8 Conclusions

We have shown in this paper that the stakeholder involvement and distribution of NVA differs between countries, based on economic opportunities and institutions. Being aware of such differences is relevant in the international policy context because many policies involve distributional impacts. Effects of e.g. changes in interest rates and agricultural policy reforms can have quite different effects in different countries, regions and farm systems. For statisticians the need for and the methods of survey integration are also dependent on these differences in stakeholder involvement and distribution of NVA. Finally, we conclude that the international integration of micro economic statistics in agriculture is feasible and useful and that this very first trial sets an agenda for future work.

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Workgroup session 2: Towards global networks of data exchange; what data to exchange?

Theme

Mrs. Moreddu gave a presentation about the OECD initiative to develop a global network of data exchange on farm level data. Mr. Covey presented a paper about the kind of indicators that could be exchanged on world level. After the development of the Network it should be decided which data to exchange. The OECD representatives that discussed the proposal already stated that data about the following subjects should be the most interesting:

'drivers for improvements in competitiveness and productivity and the distributional impacts of policy reform on the well being for farmers, farm and rural households.'

This general advice does however not lead to concrete tables/graphs. In this workshop we made the tables/graphs that should be included in the first OECD report of the Network. We asked to use the strong points of the micro data (distributions, regions).

- Group A: Income/value added
- Group B: Competitiveness
- Group C: Well being of farm households
- Group D: Wealth

Group composition

Group A

Chair: Koen Boone
Reporter: Eudard Matveev
Members: Maija Puurunen
Kaspar Muehlethaler
Ted Covey
Jyrki Niemi

Group B

Chair: Ester Van Broekhoven
Reporter: Brian Moran
Members: Catherine Moreddu
Arto Latukka
Anita Stammova
Erling Andersen

Group C

Chair: Sophie Helaine
Reporter: Lovisa Reinsson
Members: Marcin Cholewa
Olli Rantala
Beat Meier
Hans Vrolijk

Group D

Chair: Dineke van Zwieten
Reporter: Dominique Desbois
Members: Ann-Marie Karlsson
Liam Connolly
Torbjørn Haukås
Timo Sipiläinen

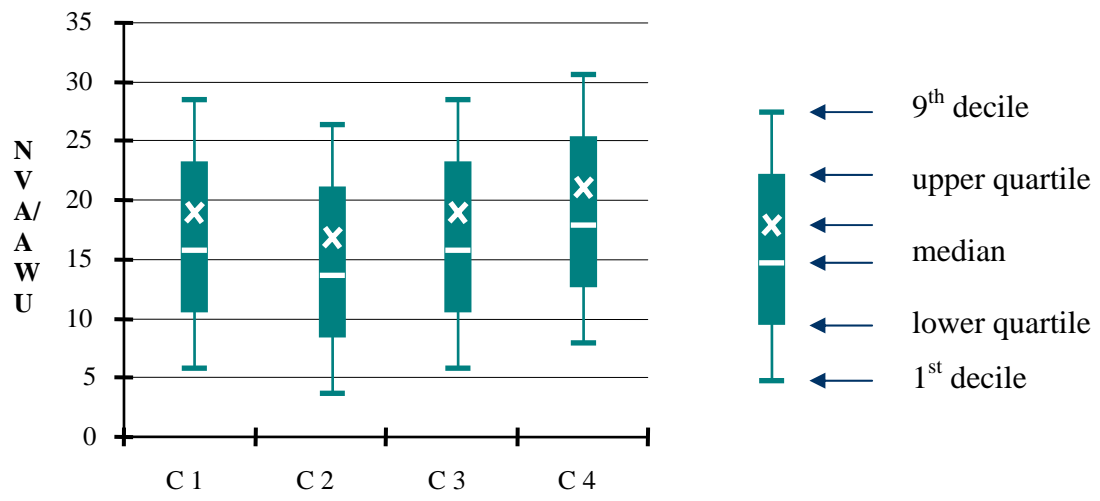
Group A

Indicators	Production forms				
	limited resource farms	retirement farms	hobby farms	...	total
NVA/AWU					
FFI/ULU					
Total costs/total output					

NVA Net Value Added
 AWU Annual Work Unit
 FFI Family Farm Income
 ULU Unpaid Labour Unit
 Total costs (including labour and capital costs)
 Total output (including subsidies)

Indicators	Type of farming				
	crop production	milk production	mixed	...	total
NVA/AWU					
FFI/ULU					
Total costs/total output					

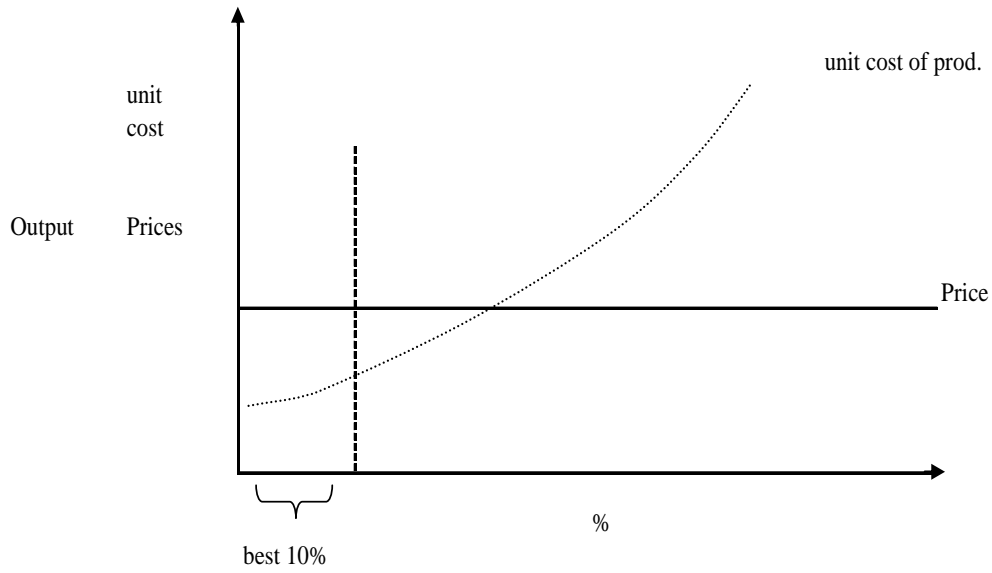
NVA Net Value Added
 AWU Annual Work Unit
 FFI Family Farm Income
 ULU Unpaid Labour Unit
 Total costs (including labour and capital costs)
 Total output (including subsidies)



Group B

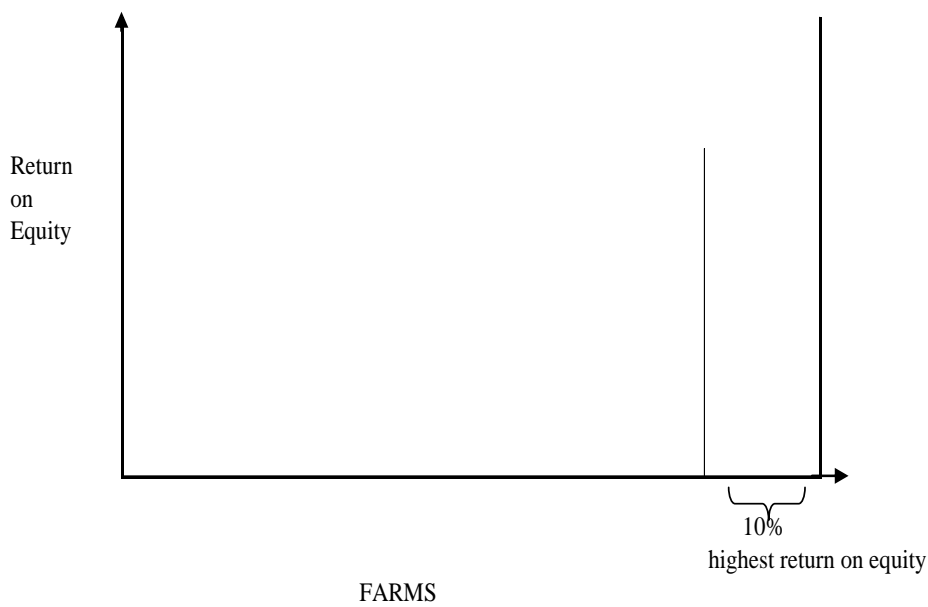
- * product by product
- * country by country

- * age
- * education
- * scale
- * sizes
- * debts



* common characteristics *

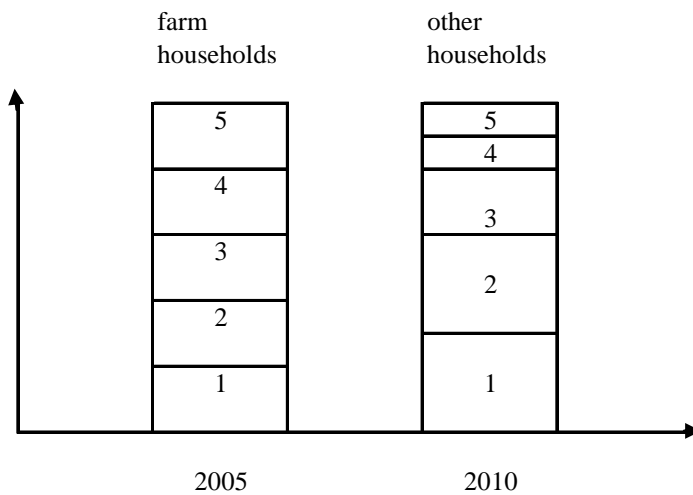
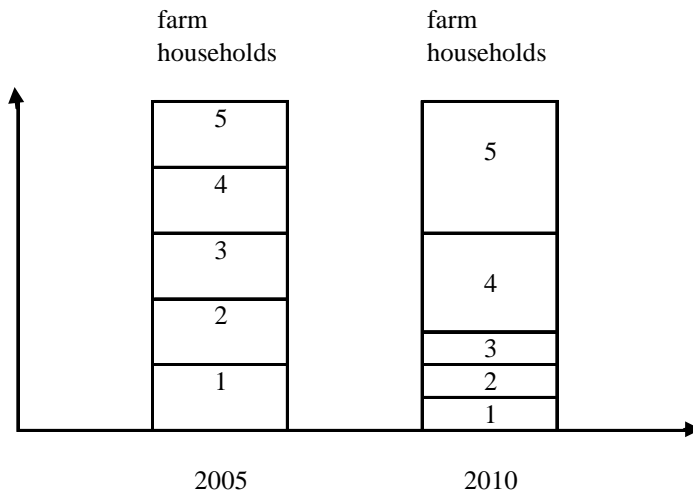
- * whole farm
- * country by country



Group C

I feel confident in the future?

1 completely disagree 2 3 4 5 completely agree



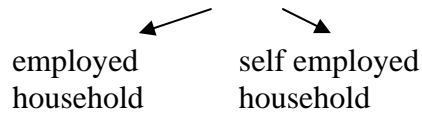
I feel:

- healthy
- secure
- ...

- There are enough public services available.
- There are enough social and cultural activities available.

Other remarks:

- each member of the household is asked
- farm households / non farm households have to be covered



Group D

- Some definitions of 'Wealth':
 - assets (of land, property);
 - net worth = (total assets - total liabilities).
- Some indicators of measurement
- How to display for policy makers

Indicators:

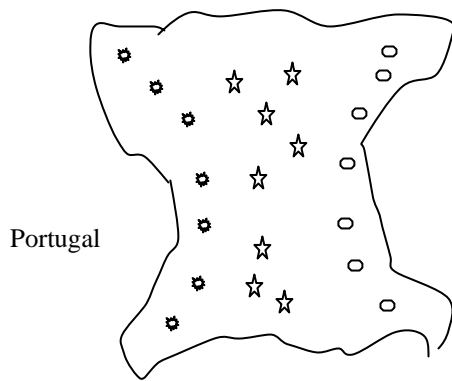
- private consumption
- different categories of assets:
 - private assets (from fiscal data, car, house, cottage, stock, shares, boats, bank accounts);
 - holding asset (from FADN);
 - household asset;
- to measure wealth:
 - other sources than FADN;
 - administrative data;
 - fiscal data;
- categories of assets holders:
 - farm household;
 - rural household;
 - farm holding;
- farmers live poor and they die rich:
 - high wealth level, but poor income level.

4 problems of coherency

- FADN data at the NUTS II level.
- Social services operates at NUTS III level.
- There is a need for a spatial or territorial unit for OECD.
- GIS is more relevant for wealth studies on rural households.



-> Regional distribution of wealth and income



11. 15 Pacioli workshops; 500 years after Pacioli

*Krijn J. Poppe and Koen Boone*¹

'Books should be closed each year, especially in partnership because frequent accounting makes for long friendship.'

Luca Pacioli, 1494

11.1 Introduction

In 1494 Luca Pacioli published his *Summa de Arithmetica Geometra Proportioni e Proportionalita* with a treatise called 'De Computis et Scripturis', in which he introduced double-entry accounting. This system became a corner stone of modern business, from where it was copied to agriculture. A highly formal record system evolved, that often asks for the help of a trained accountant. This paper discusses to which extent Pacioli's thoughts are still relevant for modern farm record systems.

The paper starts with a discussion on Pacioli's work. Next we shortly describe how this type of accounting was introduced in agriculture. After a short description of current issues in farm accounting, the paper turns to the current Pacioli-network (see www.pacioli.org).

In November 1494 the Italian monk Luca Pacioli published a book in Venice, called *Summa de Arithmetica Geometra Proportioni e Proportionalita*. As the title suggests, the publication was mainly dedicated to mathematics. In Part One, Section 9, Treatise 11 under the chapter title of 'Particularis Computis et Scriptures', Pacioli explained in Italian for the first time ever the 'Italian method' of bookkeeping, which we call double entry accounting (Geijsbeek, 1914).

Luca Pacioli was born in 1445 in San Sepulchri, a small city west southwest of Urbino in Arezzo, Tuscany. He studied with the painter and mathematician Piero della Francesca. According to Geijsbeek (1914) Pacioli was a great lecturer, mathematician, writer, scholar, traveller and a famous man. He translated Euclid in Latin and stayed at the court of Lodovico in Milan together with Leonardo da Vinci. In his older days he became a member of the Order of Friars Minor of St. Francis, for protection needed in his many travelling tours. Pope Leo X made him professor in mathematics at the Sapienza University in 1514, at that time the most respected university in the Christian world. Probably he

¹ The authors work at the Agricultural Economics Research Institute (Wageningen UR LEI) in The Hague. The first part of this paper was written by the first author in October 1996 and published in the PACIOLI 4 report.

died on June 18, 1517, although some claim he was still alive in 1523, when the second edition of the *Summa* was published (Speklé, 1994).



Figure 11.1 1494: Luca Pacioli's *De Computis et Scripturis*

Luca Pacioli was, also according to his own text, not the inventor of double entry bookkeeping, as this was probably known already for 200 years. But he was the first (as far as we know) to describe it, and to popularize it by publishing in Italian (printing was introduced by Gutenberg in Mainz, 32 years earlier).

In single entry accounting, merchants only administrated changes in stocks. Double entry accounting also records the causes of such a change: a split between capital and income records by recording every transaction twice.

Pacioli introduces three books for this type of accounting: the day book (*memoriale*), a journal (*giornale*) and a ledger (*quaderno*). Besides information on accounting as such, Pacioli provides a lot of advice in his '*Summa*' on the systems design of accounting: how to legalize books, the reasons for orderly accounts etcetera.

Very interesting is Pacioli's discussion of the day book: it is necessary for those merchants who have a lot of transactions that cannot orderly be entered in the journal directly.

The day book should contain all relevant information of the transaction:

'The memorandum book, or, according to others, scrap book or blotter, is a book in which the merchant shall put down all his transactions, small or big, as they take place, day by day, hour by hour. In this book he will put down in detail everything that he sells or buys, and every transaction without leaving a jot, who, what, when, were, mentioning everything to make it fully as clear (...).' (Chapter 6, quoted from Geijsbeek, 1914, p. 39.)

It could be filled in by young trainees and women (!) when the merchant and his assistants were travelling. This 'back office' probably had poor writing skills. Pacioli argues therefore that it does not make sense to give directions for the use of the day book: it is more important that everything and all relevant details is noted down than the form in which this happens. A notebook to memorize, with 'substance over form'. In chapter 8 he describes how entries should be made:

'Let us say, for instance, that you bought several pieces of cloth - for instance, 20 white bresciani at 12 ducats apiece. It will be enough simply to make the entry in this way. on this day we have or I have bought from mr. Filippo d'Rufoni of Brescia, 20 pieces of white bresciani. These goods are at mr. Stefano Tagliapietra's place, one piece is so long, according to the agreement, and paid a trelici, or a la piana, wide or narrow, fine or medium, whether the Bergamo kind, or Vincenza, or Verona, or Padua or Florence or Mantua. Also you have to state here whether the transaction was made through a broker and whether it was made in cash entirely ... [follows another 5 lines with examples of things to note down].. Finally I must say that in this memorandum book nothing should be omitted. If it were possible it should be noted what many others had said during the transaction because (...) the merchant can never be too plain.' (Quoted from Geijsbeek, 1914, p. 41.)

Reading this practical description one wonders if we should not put a bit more flesh and blood into our data models, data flow diagrams and manuals. In Pacioli's accounting system, the journal is a secret (that is not available for all persons in the business) book that orders the entries in the day book in a more systematic way (journal entries). A lot of details of the transaction can be omitted, as the entries refer to the original notes in the day book. The journal is the bases for the updating of the ledger. Although profit calculation per activity was (at that time) more important than the profit per period, a periodic report is possible and advocated (Speklé, 1994).

11.2 From Pacioli to farming today

The know-how of Pacioli (or more general: Venice and the North of Italy) very soon found its way to the Low countries: the Antwerp merchant Jan Ympyn Christoffels worked in Venice and used Pacioli's 'De Summa' to write his *Nieuwe Instructie* (New Instruction) that was published in 1543. Shortly afterwards it was translated into French and English, and it

is thought to have raised the standards of accounting in these North European countries considerably. This also holds for another famous mathematician that promoted and further improved accounting by his writings: the Dutchman (or better: Flemish) Simon Stevin.

From that time on accounting became more and more formalized. The first joint stock company ever (the VOC, the Dutch East India Company, listed in the 17th century at the Amsterdam Stock Market) influenced accounting (Ten Have, 1973). During the 19th century the industrial revolution (with fixed capital and depreciation) influenced accounting theory.

Under the influence of this process of formalization a general theoretical consensus was born that the double-entry method was superior because it could solve so many accounting problems simultaneously. But despite this theoretical consensus, accounting practices were remarkably varied and for centuries accounting practice did not reflect accounting theory (Carruthers and Espeland, 1991). A reflection that also seems to be true for agriculture.

Modern accounting in agriculture has heavily been influenced by the experiences outside agriculture. Estate accounting dates from before Pacioli. And at the time the work of Pacioli was popularized and improved in the Low Countries by Ympyn and Stevin some farmers already kept books. The oldest known case in the Netherlands is that of Rienck Hemmema. This Frisian farmer kept a 'rekenboek off memoriael' (calculations book or day book) on his mixed farm between May 1569 and December 1573. In chronological order he noted receipts and expenses, harvested yields, negotiated labour contracts and work carried out on the different fields (Kuperus, 1964). In a case from the same region but thirty years later, a farmer even noted his observations on the weather, important events, recipes and family announcements.

The earliest publications on farm accounting for farms which are more or less comparable with today's family farms date in North-west Europe from the 19th century. An example is the Netherlands (Kuperus, 1964, 1970). The earliest publication (I.G.J. van den Bosch: *Handleiding tot doelmatig boekhouden op een landelijk bedrijf* (Manual for efficient accounting on a rural enterprise) dates from 1843, and is the result of a prize contest in 1839 by the Commission for Agriculture in the province of Zeeland. Van den Bosch used double entry accounting to illustrate the bookkeeping of a farm in Zeeland. He is not unique. A list of book titles on farm accounting in the Netherlands, Germany, France and the U.K. published by Van Schaik (1918) quotes several works that refer to double entry in their title. This does not mean that single entry accounting was not practised. In his reference work Van Schaik (1918) used the first 200 pages to teach single entry accounting and then explained double entry in the next 70 pages. But it shows that double-entry accounting was viewed as a valid and theoretically preferred option. Practices outside agriculture will have influenced this view.

In most countries the adoption of accounting by farmers has been enforced by law. Especially fiscal regulations that force farmers to keep books to determine income tax have been important. In the Netherlands this obligation dates from 1914, but in other European countries (like Switzerland and Portugal) this is a recent blessing. Another obligation comes in the E.C. from the agricultural structure policy. According to an E.C.-Regulation from 1973, farmers who take up financial support for farm improvement, have to keep books for a number of years.

This process of forced adoption, and hiving of this activity to professional accounting and tax consultancy offices led to a further formalization of the accounting system. The above mentioned mr. Van den Bosch and his German counterpart Thaer advised farmers in the 19th century to keep a kind of weekly diary to register cash flows as well as other important events, like changes in stocks, use of labour and other important business aspects. In the beginning of this century such advice became rare, as the fiscal obligations stressed systematic (!) day books (like a cash book, a bank book, a sales book etcetera) that can provide only data to be used in journal entries. The calendarfunction of the memoriale that provides a lot of management information disappeared. In the process of computerization, the systematic day books were easy to automate, so this suited efficiency well.

11.3 Current issues

This importance in the shaping of farm accounting of external reporting and hiving off the accounting activities to professional experts, has given birth to a number of critical remarks by several authors on the usefulness of accounting for farmer's management decisions (Hardaker and Anderson, 1981; Poppe, 1989). Central in many of these critical remarks is that systems are based on formal procedures used by accountants, and that not much research has been carried out on actual needs of farmers and their understanding of accounting. More a normative than a positive approach.

On the other hand - and notwithstanding arguments for simplification of paper work in agriculture-accounts are here to stay. Politicians advice or oblige farmers in Western as well as Central and East European countries to use them. Forms of environmental accounting are quickly becoming a normal part of good agricultural practice.

Perhaps it should provide comfort that also outside agriculture a search exists for better management information systems. To quote only one author (Elliot, 1992):

'Trying to run my organization with the output of our accounting department is like trying to fly an airplane that has only one dial - a dial that shows the sum of air-speed and altitude. If it's low, I'm in trouble, but I don't even know why.'

A lot of attention in accounting research is nowadays given to e.g. cash accounting, activity based costing, database oriented accounting (recording events in stead of results), triple entry accounting (momentum of profits) and EDI.

11.4 The PACIOLI network

Exactly 500 years after the publication of 'De Summa' by Luca Pacioli, the 'PACIOLI-word' became once more fashionable in European farm accounting. This time it's an acronym: Panel in ACcounting for Innovation, Offering a Leadup to the use of Information modelling. PACIOLI is a EU-sponsored concerted action of researchers and other stakeholders interested in farm accounting and in farm accounting data networks.

PACIOLI started at a conference in Bonn, where a paper by Poppe (1992) attracted the attention of Mr. Val Reilly of DG VI of the European Commission. He advised to make a proposal for the AIR-programme. After one failed attempt with a large research project on information modelling, George Beers and Krijn Poppe succeeded in creating the PACIOLI network. The network was originally created by seven member states with the support of the RICA-unit in DG VI. In March 1995 researchers and FADN managers, as well as some persons from relevant administrations in the Netherlands, United Kingdom, Finland, Sweden, France, Spain and Italy, and from the FADN unit in the European Commission gathered for the first workshop at the Dutch island of Ameland. The main goals of the concerted action were to improve the quality of the data, to improve the use of the data and to assess the cost effectiveness of FADNs. After the first workshop other member states, as well as the IASC (International Accounting Standard Committee, that worked on a standard that would over time become IAS 41) joined the discussions.

The fourth workshop PACIOLI-4 was held two years later in Parma, and closed the EU financed concerted action. However participants decided to keep the network alive at their own cost. Especially for FADN managers PACIOLI turned out to be a forum to discuss innovations in their networks. Scientific conferences nor the formal meetings of the FADN Committee in Brussels offered such an opportunity. Until now every workshop ended with the recommendation to organise another workshop in the coming year. The network had always an open character, with its own website and suggestions to interested persons from other countries to join. This was always much focussed on Europe, where PACIOLI was also a platform to exchange experiences between EU countries and non-EU countries (like Norway, Switzerland, the western Balkan). In recent years the scope has been broadened to North America.

Participants' countries or international organisations	
■ Poland	DG-AGRI
■ Hungary	
■ Czech republic	EUROSTAT
■ Croatia	
■ Estonia	OECD
■ Latvia	
■ New Zealand	IASC
■ Turkey	
■ Luxembourg	
■ Austria	
■ Lithuania	
■ Macedonia	
■ Ireland	
■ Iceland	
■ USA	
■ Canada	
■ Greece	
■ Denmark	



Figure 11.1 Participants' countries of origin or their international organisations

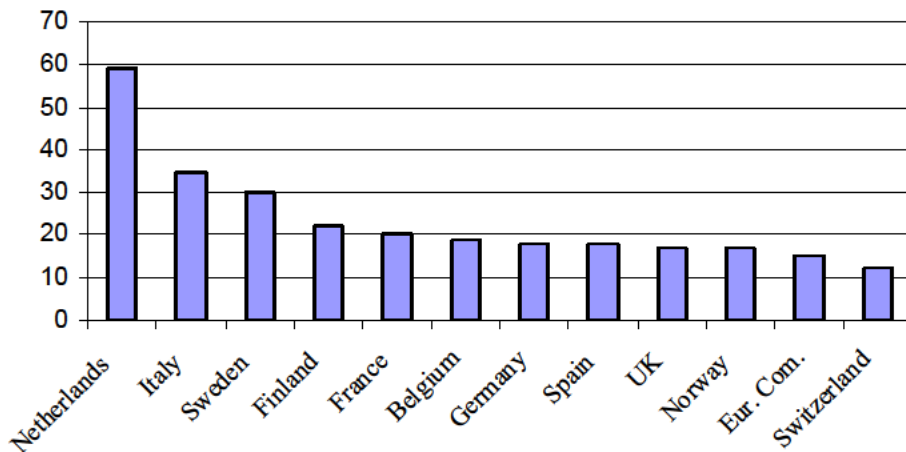


Figure 11.2 Participants per country of origin

In the first 14 workshops 362 persons participated, which means an average of 26 per workshop. This number is influenced by the 33 participants at PACIOLI-4 in Parma, when the concerted action was closed. The all time low was at PACIOLI-11 with 19 participants, which implies that nearly all workshops had between 20 and 25 participants. They came from 29 countries, including four international organisations (figure 11.1, figure 11.2).



Figure 11.3 Locations of PACIOLI workshops

The workshops were held in different locations all over Europe (figure 11.3). Most of them were hosted by organisations involved in the FADN. The workshop in Paris was locally organised by the OECD and linked to an OECD seminar for policy makers. In total in the first 14 workshops 190 papers or presentations were given and 55 working group sessions for discussion were organised.

The topics of the workgroup sessions varied quite a lot. Some of the main themes discussed in these 12,5 years are:

- masterclasses (data modelling, risk management);
- what's a farm/household?
- typology;
- assembling data on new subjects/changes in policy;
- stakeholder analysis;
- exchange of data;
- new technologies;
- write project proposal;
- develop a common website;
- subjects for next PACIOLI-workshop.

The papers presented in the workshops also varied, and over time some themes went out of fashion, others were picked up. General descriptions of FADNs were quite important in the network to get to know each other. This started with descriptions of the networks in the countries that founded the network, and then moved on to presentations of FADNs in candidate countries and new member states. With recent descriptions of systems in Croatia and Macedonia, this theme has probably run its course, although the network nor the systems are static, so a new generation might benefit from new descriptions and discussions.

Two FADN related technical topics stand out in the presentations, were FADN managers seek the advice of their peers and reflect on more formal discussions at the FADN committee: typology and statistical methods like selection and weighting of farms. The typology issue is related to changes in farming and in farm policy. Many FADN managers are not themselves an expert in the highly technical domain of statistical methods, but see the important effects of farm selection and weighting on the results they publish. This makes the topic relevant for the workshops. One would expect the technical issues of accounting (like valuations) also on this list. Attention has been paid to the IAS/IFRS (International Financial Reporting Standards) in some presentations, but this topic is not often on the agenda. Probably this is for most participants a straight forward theme that is also discussed in detail in the FADN committee in Brussels.

Innovation in FADNs is the core issue of the workshops. This often deals with new data. In the 1990s environmental data were an important topic of discussion, in the new millennium this changed to off farm income issues. The other issue in innovation of the past twelve years has been the fast development in information and communication technology. Discussions on innovation and the need for changes are often supported by presentations from researchers that use the data and study new agricultural policies or other phenomena in agriculture.

Over time persons have left the network, others entered. The top-10 is given in figure 11.4. By definition such a statistic shows many persons from the workshops that left the network, often due to retirement or changing jobs. A number of FADN units have been very strong consistent supporters of the network as a source of exchanging experiences on innovation. These now include the Netherlands, Belgium, Sweden, Finland, Norway, Macedonia and the US (where the equivalent of FADN is ARMS). Some new EU member states showed a high interest for some years, mostly in pre-accession time, and afterwards it depends more on persons than institutions. In Italy, France and Spain the interest also became very dependent on personal interest. The participation from Eurostat (Typology, IAHS issues) and DG-Agri varied through time, but was higher in the official original concerted action.

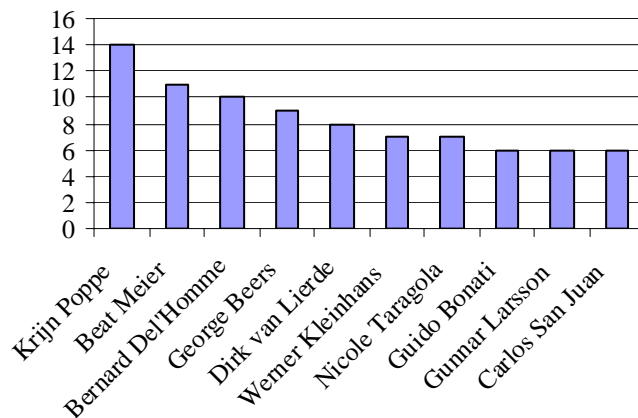


Figure 11.4 Top 10 participants

Although the network has mainly a function towards the participants itself, it certainly also had an impact on outsiders. Reports of the workshops are downloaded from the website. PACIOLI contributed to discussions on methodology in IAS 41 (later IFRS), and in the *UN Wye City Group's Handbook for Rural Households' Livelyhood and Well-Being*. It also helped OECD in getting the message across that micro-data are essential to monitor income developments in agriculture.

The PACIOLI network has demonstrated over time to be attractive for new participants. It is clear that there are network effects and learning effects. After 15 workshops, and more than 500 years after Luca Pacioli wrote his famous treatise, PACIOLI is 'alive and kicking'.

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12. Integration of farm accounting data in the economic accounts for agriculture statistics in the republic of Macedonia

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Abstract

The agricultural sector in Macedonia is in a process of restructuring. Adequate information is absolutely necessary in this process. Agricultural Agro Monetary Statistics are an important statistical need in Macedonia. Economic Accounts for Agriculture (EAA) statistics at the State Statistical Office of Republic of Macedonia (SSO) have that quality level that they present important information about the economic situation for the agricultural sector in Macedonia and its relation to other parts of the Macedonian economy.

The main users of the agro- monetary statistics in the Republic of Macedonia are the Ministry of Agriculture, Forestry and Water Economy (MoA), the Ministry of Economy, Universities, scientists and researchers, the Chamber of Commerce, consulting agencies, the National Extension Agency (NEA), traders and international organizations. The most important user's demands are timeliness, flexible and rapid access to statistical data and high quality of the agricultural statistics at farm, as well as the sector level.

The activities to achieve a successful real advantage increase the cooperation between different public and private institutions. The activities are directed towards private economy realizing entrepreneurship in Macedonian chain of agricultural food products as an in-vigorator for rejuvenating the agriculture. Development of the quality of Farm Monitoring System (FMS), and therefore of Farm Accountancy Data Network (FADN), enabled a solid basis for their implementation in the EAA-compilation. This process will improve the quality of EAA-statistics, especially the part concerning intermediate consumption side.

Key words: Economic Accounts for Agriculture, Farm Accountancy data Network, Farm Monitoring System, individual agricultural producers, agricultural enterprises, agricultural output, intermediate consumption, agricultural income, value added.

12.1 Introduction

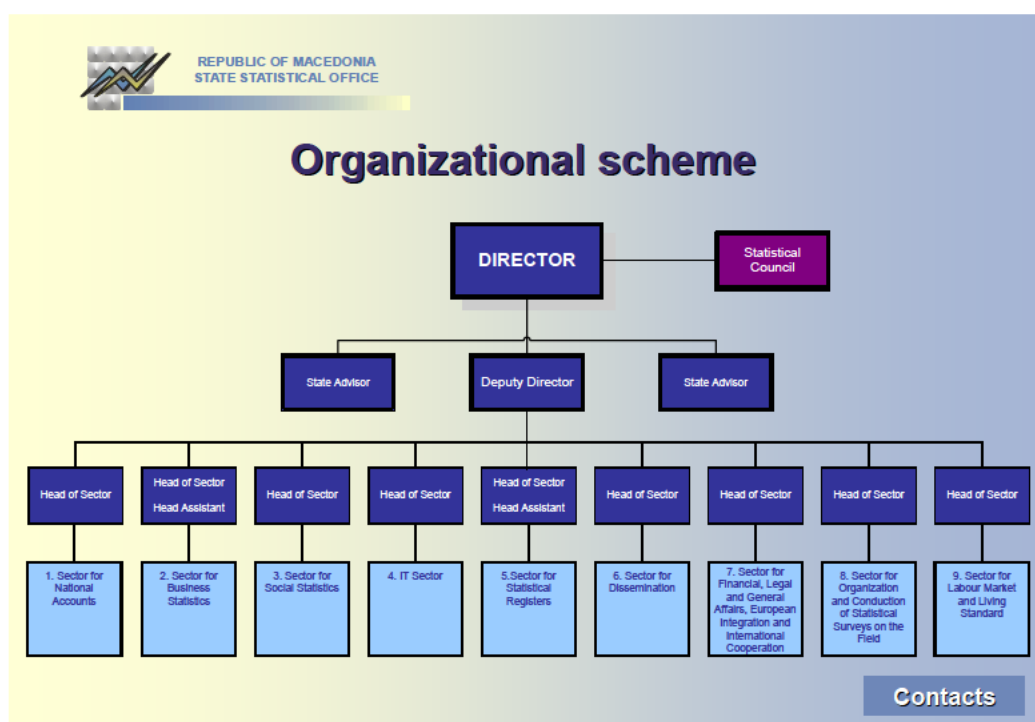
The State Statistical Office of the Republic of Macedonia is responsible institution for all official statistics in Macedonia. Agriculture is an important part of Macedonian economy. Agricultural sector contributes to the Gross Domestic Product with more than 10%. The

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statistical services for the sector must therefore meet changing demands on information and an important government policy requires that EU statistical standards are reached as soon as possible.

Within the agricultural sector there are two categories of agricultural economies: agricultural business units (enterprises) and individual agricultural holdings (private/family farms). Both categories of economies play considerable role, building a specific agrarian structure in the forthcoming development of agriculture. Macedonian agriculture is predominately small-scale and mixed.

The Economic Accounts in Agriculture are produced on the basis of methodological concepts, definitions, accounting rules and unified classifications applied by the Member Countries of the EU, contained in 'Manual on the Economic Accounts for Agriculture' EAA 97 (rev. 1.1), published by Eurostat.



Economic Accounts for Agriculture are set up using the OPAL (software application which is fully consistent with the 'Manual on the Economic Accounts for Agriculture' EAA 97 (rev. 1.1), published by Eurostat). The EAA for 2005 is finished and for 2006 is still in the process of setting up, following the recommendations from the manual as much as we could depend on the data available. In the course of the calculations, methodological adjustments have been made depending on available data sources, as well as specific characteristics in the domain of agriculture in Macedonia. Regarding the production data some improvements in the data sources have to be done in order to fully follow the EAA-recommendation.

With the development of the agricultural information system, most recent data sources are appropriately used, especially the data obtained through FADN, which continuously develop and improve the economic accounts for agriculture.

12.2 Economic Accounts for Agriculture in the Republic of Macedonia

12.2.1 Measurement of output

The measurement of agricultural output is based on an adaptation of ESA 95 rule. The output of the industry represents all the products produced over the accounting period in question by all the units of the industry except for goods and services produced and consumed over the same accounting period by the same unit. In the EAA, agricultural output represents the sum of production by all units in the industry (excluding production for intermediate consumption by the same unit), plus production used as intermediate consumption by the same unit, provided this output is intended for two different basic activities.

12.2.2 Sequence of Accounts

The EAA statistics are based on a sequence of inter-related accounts in which are recorded transactions from the generation of income through income accumulation in the form of assets, to its distribution and redistribution.

The balancing items (gross value added, net value added, mixed income) that are deducted from them are then used as *aggregates for measuring economic performance*.

The *current accounts* deal with the production, distribution and redistribution of income and its use in the form of final consumption. The production account records transactions relating to the production process. The value added excludes taxes on products but includes subsidies. The *generation of income account* is concerned with the formation of income resulting from the production process and its attribution to the 'labour' production factor and general government (in the form of taxes and subsidies). The *entrepreneurial income account* makes it possible to measure income which is similar to the concept of current profit before distribution and taxes on income, as customarily used in business accounting. *Accumulation accounts* analyse the various components of changes in the assets and liabilities of units and make it possible to record changes in net worth. The *capital account* makes it possible to determine the extent to which acquisitions less disposals of non-financial assets have been financed from saving and capital transfers.

12.2.3 Compilation of Economic Accounts for Agriculture

For the preparation of accounts were used data gathered from regular statistical surveys conducted in the State Statistical Office, annual accounts from the Central Register and data for paid financial aid in agriculture by the Ministry of Agriculture, Forestry and Water Economy. For the estimation of value added from *individual agricultural producers*, available data are used from the State Statistical Office and from the National Extension Agency.

For calculation of value added in *agricultural enterprises*, available data are used from the State Statistical Office and annual accounts from the Central Register.

Data on *crop production* of agricultural enterprises and cooperatives are gathered by regular statistical surveys with full scope. The data in reports are based on accountancy and other evidence. For individual agricultural economies, data are received by an estimation made by statistical evaluators.

Data on *cattle number* are taken over from the Survey on Individual Agricultural economies and regular annual reports on agricultural enterprises and cooperatives. Data on livestock production are calculated on the base of livestock number, and the livestock balances are compiled on the base of livestock data from the Survey and annual reports.

The data required for the calculation of work force input are taken over from the Labour Force Survey, which is conducted by the State Statistical Office.

The gross value of production includes the production of 'small units' which has a substantial character, as well as the production of units for whom it has a character of a hobby.

Although the FADN population is not representative for all farms in Macedonia, it is used with help from 'help variables' for estimations on intermediate consumption side.

Due to a lack (inexistence) of data for paid subsidies and collected taxes by product in EAA calculations, *the value of production by basic prices* equals the *value by production prices* (value of production by basic prices + subsidies by product = value of product by production prices).

Obtained data required for the compilation of EAA is joined and processed in OPAL software programme, developed by the ASA Institute in Bonn, Germany, in accordance with the recommendations of the European Union for data comparison among the Member Countries.

12.2.4 The classification

The Economic Accounts for Agriculture are an integral part of the European System of Accounts and therefore for their compilation use is made of the National Classification of Economic Activities, which is harmonized and comparable with *General Industrial Classification of Economic Activities within the European Communities* and *NACE Rev.1*.

Statistical classification of products by activity (CPA) is also used for detailed descriptions of characteristic products and services.

For national accounts purposes the agricultural industry is defined as all units performing, either solely or together with other secondary economic activities, activities which come under Division 01 of NACE Rev.1 'Agriculture, hunting and related service activities'. The EAA agricultural industry differs in some respects from the branch as defined for National Accounts purposes. The differences relate to the specific nature of accounts, data sources aspect and to definition of both characteristic activities and units.

12.2.5 Agricultural income

The principal objectives of the economic accounts for agriculture is to measure agricultural income and changes therein. The sequence of accounts of the agricultural industry makes it

possible to calculate three balancing items which can be used as an income aggregate for the agricultural industry: net value added, net operating surplus (net mixed income) and net entrepreneurial income.

Net value added of the industry measures the value created inside agriculture, after the consumption of fixed capital. *Net value added at factor cost* (defined as net value added at basic prices less other taxes on production plus other subsidies on production) measures the remuneration of all factors of production and can be termed 'factor income'. *Net operating surplus* measures the yield from land, capital and unpaid labour. It is the balance of the generation of income account, which indicates the distribution of income between the factors of production and the general government sector. *Net entrepreneurial income* is obtained by adding the interest received by agricultural units organised as companies to the net operating surplus and then deducting rent (i.e. farm and land rents) and interest payments. Net entrepreneurial income is equivalent with net operating surplus because of lack of data for interest and rent paid and for interest received.

In the case of sole proprietorships, entrepreneurial income represents, on one hand, the compensation of the work performed by the agricultural holder (and the work of unpaid family members) and, on the other, the income remaining with the enterprise, without it being possible to separate these two components

In order to calculate nominal and real factor income in Agriculture per labour input annual work units (AWUs) are used. One AWU corresponds to the input, measured in working time, of one person who is engaged in agricultural activities in an agricultural unit on a full-time basis over an entire year.

A distinction is drawn between unpaid and paid AWUs, which together make up total AWUs. Paid AWUs are calculated by number of paid working hours while unpaid AWUs from number of unpaid working hours in Agriculture during the year.

12.3 FADN as data source for EAA compilation

Responsible institution for collecting, processing, analyzing and publishing FADN data in the Republic of Macedonia is the National Extension Agency. The Agency with its advisors visits the individual agriculture manufactures all the time, supports and cooperates with agriculture associations, their unions and other associations and constantly exchanges information and gives professional advice.

Implementation of the FMS enables the development of a farm to be followed by experts. The advisors are present on the field and there they get high quality on-time information. At the same time, they give expert advices to the farmers and help them to overcome certain problems in the process of the agricultural production.

The farmers participating in the FMS get a notebook where they write down what items they have produced, bought and sold and the quantities and prices related to these items. The advisors visit the farms and collect the information from the notebooks and at the same time they collect additional data, for example on hours worked and stocks. In some cases the farmers have not filled in the notebook, so the advisor also has to do this. After the data collection, the advisors enter data into a relational database. These are, for example, FADN-reports and reports for MoA and SSO.

The FMS collects a wide range of data such as: data for the farm resources, the yields, incomes, costs, labour, and so on. FMS covers farms, which have a long-term cooperation with the advisors. Different types of data collected with the FMS give possibilities for different analyses, which can be useful for different users.

The FMS has been functioning in continuity for more than four years. The FMS has been upgraded during this period and it is getting closer and closer to fulfill the FADN requirements. The FMS gives a possibility for calculation of gross margins for different types of crops or animals. A number of training activities were conducted involving the training of regional coordinators in FADN calculations, how the Farm Monitoring System (FMS) data is used to produce FADN variables, how to perform quality checks and how to use the EU control system.

The summary FADN report for particular farm shows variety of data types at basic level. These data are divided according to time of producing, type of cost etc. There are data for general indicators as association membership, having off-farm income, investments, processing types in farm etc. The information system enables the basic data for specific farm given in the table to be grouped according to different criteria, i.e. type of production (animal/crop), type of cost/income from final processing of agricultural products (animal/crop) etc. The database gives opportunities for satisfaction of statistical needs, especially for EAA compilation.

For the moment, there is no reliable information on the universe of farms in Macedonia. Information will be available when the data from the Agricultural census, which was carried out in June 2007, have been entered into a Farm Register. However up to this point it is difficult to make conclusions on how the FMS data are representative. At this point, the population of all farms and the structure of farms in Macedonia are unknown, which makes it impossible to relate the figures to national level.

Coherence of FADN with other statistical registers is not fulfilled in the FMS. This means that data definitions and technical formats are not harmonised and therefore cannot be merged and used in combination with other registers. Data in the FMS are only collected from private farms. In order to cover 90 per cent of the production also enterprises have to be included.

A drawback for the comparability over time is the relatively small sample, which causes a high variation in the estimates. This is especially important for Gross Margins for some crops with a few observations.

The basic principle of FADN is using accountancy data based on double entry bookkeeping. The Macedonian FADN data do not fulfill this requirement. There are some areas where the quality is low. The areas are: the value of land and buildings, dead stock and circulating capital and debts. For quite a few items the data required for FADN-purposes can be derivable for example annual working units (AWU) and the evaluation of crop and live-stock.

The private farms in the Republic of Macedonia are not obliged to keep books. The enterprises and the agricultural co-operatives are required to keep books and NEA uses some data from the bookkeeping.

Gross margins, receipts and direct costs for each crop and type of animal are collected and figures per hectare or per animal are calculated. Receipts and costs split up on

various items and the family farm income are calculated. This indicator is calculated at farm level.

Economic accounts for agriculture have been published by SSO in June 2005, for the first time, covering the period from 1998-2003. From 2006, EAA are being published as regular annual statistical release. The completed EAA data set has been transmitted to EUROSTAT, using standard transmission tables. This included EAA by current prices and constant prices, Unit Values statistics and Annual Working Units.

12.4 Conclusions

Agriculture is the main sector in the Macedonian economy and is in a process of restructuring. Adequate information is absolutely necessary in this process. EAA statistics at SSO have the quality level that they represent important information about the economic situation for the agricultural sector in Macedonia and its relation to other parts of the Macedonian economy.

As in many other countries, the output figures for Macedonia in EAA are of better quality than the input or cost figures. Most of the figures for the intermediate consumption items for the household farms are based on calculations and technical coefficients and not on statistics from statistical surveys or registers. Currently there is no frame for carrying out statistical surveys among household farms. As soon as a statistical farm register has been created, it is important to conduct statistical surveys about, among other things, intermediate consumption. Development of the quality of FMS, and therefore of FADN, enabled a solid basis for their implementation in the EAA compilation. This process will improve the quality of EAA statistics, having in mind that FADN gave possibilities to explore the economic parameters of a specific farm at micro level. The challenges and responsibilities in the process of European integration increase the challenges in the agriculture as a sector and in agricultural statistics too.

13. FADN in space; spatial aspects of the SEAMLESS database

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Abstract

The SEAMLESS project aims to build a computerised, integrated framework to assess, ex-ante, agricultural and environmental policy options at the full range of scales from field to global. At the level of the European Union the main data source on farming is the Farm Accountancy Data Network (FADN). One of the challenges in the project has been to build an integrated database holding all the data to be used in the project. This paper describes this integrated database with a focus on the link between the data stemming from FADN and the biophysical data. Examples are given to illustrate the use of the database for integrated modelling and assessments.

Keywords: FADN, database, biophysical data, integrated assessment.

13.1 Introduction

The aim of the SEAMLESS project² is to provide a computerised, integrated framework to assess, ex-ante, agricultural and environmental policy options at the full range of scales from field level to global level. Analyses shall cover environmental, economic and social contributions of a multifunctional agriculture towards sustainable rural development and rural viability. It must also cover a broad range of issues such as climate change, environmental and agricultural policies, rural development options etcetera. The modelling framework includes already established models such as CAPRI³ and GTAP⁴ as well as models developed within the project.

One of the challenges in the SEAMLESS project has been to build an integrated database that provides all the data to be used in the modelling framework (and also to store model output such as indicators). To facilitate the modelling it was furthermore required that the data on for example farming and on biophysical characteristics such as climate and soil should be linked to each other. This will enable the modelling of farming systems and the assessment of model results within a specific homogenous biophysical context. This has not been achieved at the level of the European Union before, where the main databases

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² See www.seamless-ip.org

³ See http://www.ilr1.uni-bonn.de/agpo/rsrch/capri/capri_e.htm

⁴ See <https://www.gtap.agecon.purdue.edu/>

on farming are linked to relative large administrative regions with very heterogeneous climate and especially soil conditions. The data from the Farm Accountancy Data Network (FADN), for example, are linked to so-called FADN regions. The number of these regions is 134 for the 27 Member States of the European Union. On the one hand this results in regions that are too large to grasp the diversity of biophysical conditions for farming, and on the other hand it should also be kept in mind that administrative borders only rarely coincide with biophysical borders - except for coastlines.

The following section of this paper gives a brief description of the SEAMLESS database and explains some of the elements in the data processing crucial for the linkage of data on farming and biophysical data. Section 13.3 presents some results that can be derived from the database to illustrate the options for the use of the database for linking FADN data to agri-environmental zones. In the final sections the scope of the work is discussed and some planned additions are presented.

13.2 The SEAMLESS database

The SEAMLESS database is still under development and population. In the current version the database consists of 329 tables including 2,035 different fields and with 379 relations between the tables. The number of records in the database now exceeds 7.4 million. The database is built using the open source software Postgres¹ with an extension to handle geographical data using PostGIS² and Geoserver³. However, the extension is currently used only for visualisation on maps - the relations between farm types and administrative and biophysical regions are all included in the database enabling spatial explicit analyses directly from the data.

Almost all the data that are included in the SEAMLESS database are processed and adapted to the use in the SEAMLESS project. Three aspects of this processing are relevant in order to understand the linkage between the FADN data and the biophysical information.

Firstly, the FADN data has been aggregated to farm types. This is based on a farm typology elaborated in earlier projects and adapted to SEAMLESS. The typology is based on a combination of three different dimensions, a size dimension, a specialisation and land use dimension and an intensity dimension. An example of a SEAMLESS farm type is thus large scale, medium intensity, arable/cereal farms - the most dominant type managing 15% of the area in EU25 in 2004. More information on the typology can be found in the publication from the Pacioli workshop in 2006 (Andersen et al., 2007) and in Andersen et al., 2006. One of the reasons that the single farms included in FADN are aggregated to farm types is the disclosure rules that only allows to present data for groups of farms based on 16 or more sample farms.

¹ See www.postgresql.org

² See <http://postgis.refractory.net>

³ See <http://geoserver.org>

Secondly, a spatial framework has been integrated in the SEAMLESS database building on delineating so-called agri-environmental zones. The zones are based on a combination of biophysical characteristics and administrative borders aiming to identify regions where the biophysical conditions for farming are relatively homogenous. At the same time the link to the marked level modelling was ensured by the inclusion of the administrative regions in the definition.

To delineate the agri-environmental zones we have made an overlay of:

- administrative regions (NUTS2, for United Kingdom NUTS1);
- 12 environmental zones (Homogenous climate conditions);
- 7 soil types (Homogenous soil conditions).

An example of the resulting agri-environmental zones is shown in figure 13.1 for Denmark, where the entire country is a NUTS2 region. This is further divided in 2 environmental zones with different climatic conditions: The North Atlantic and the Continental zones. Each of these 2 environmental zones holds 7 different soil types, resulting in a total of 14 agri-environmental zones in Denmark. A very close look at the map reveals that the environmental zones are continuous in space with the Continental zone in the Eastern and Northern part of the country and that the soil types, and thus the agri-environmental zones, are scattered in patches within the environmental zones.

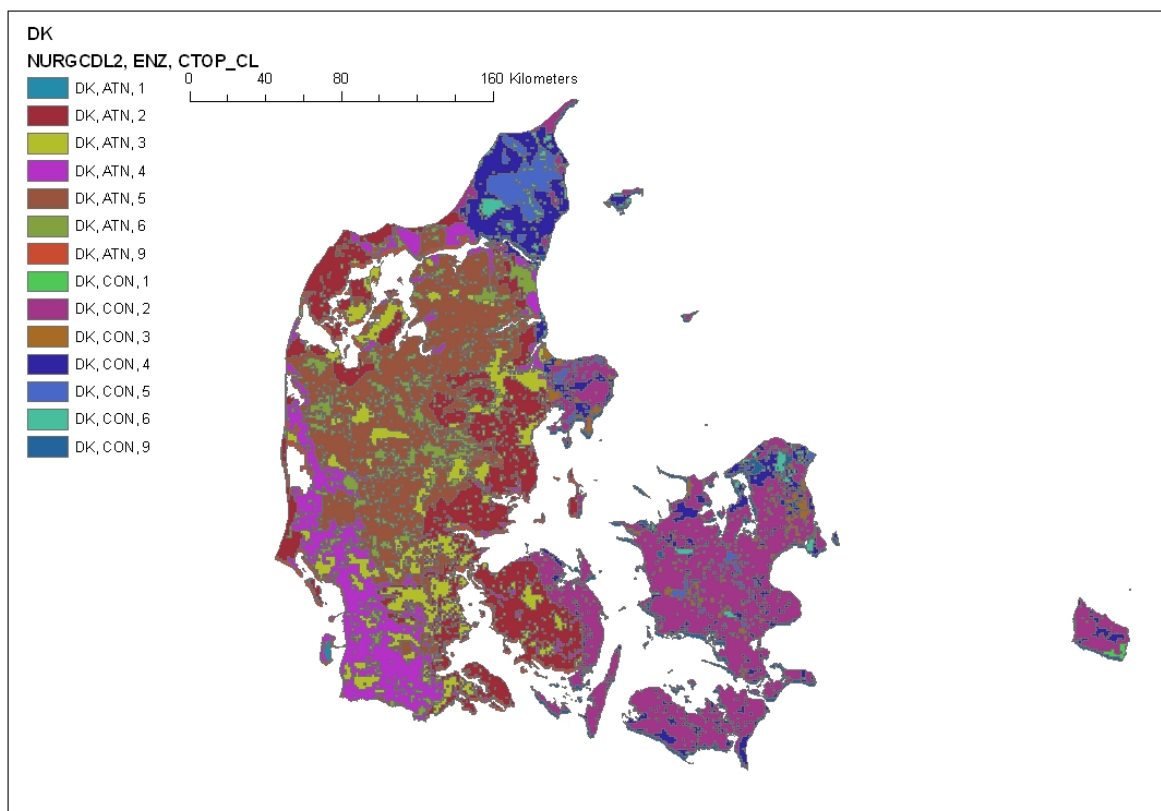


Figure 13.1 The agri-environmental zones in Denmark. The environmental zones are Atlantic north (ATN) and Continental (CON) and the numbers refer to the soil types

For EU25 in total the delineation results in 3,513 agri-environmental zones with an average size of 132,013 ha, ranging from 1 ha and up to 7,599 200 ha. For a more thorough description of the approach see Hazeu et al. 2006.

Thirdly, the farm typology and the agri-environmental zones are linked. This is done using 2 inputs:

- the allocation of crops to so-called homogenous spatial mapping unit elaborated in the Dynaspat project;¹
- the allocation of farms to altitude zones and less favoured areas based on the information included in the FADN data.

Based on this the optimal match of farm cropping patterns and yield levels are identified by applying a Bayesian Highest Posterior Density method. The result of this is a calculated probability that a certain farm manages land in a certain area. In the SEAMLESS database this is aggregated to the area within a specific agri-environmental zone that is managed by a certain SEAMLESS farm type. This information is merely a calculated probability and is not linked to the specific FADN variables as such. This means that the information can be included without violating the disclosure rules. The method is described in more detail in Elbersen et al., 2006.

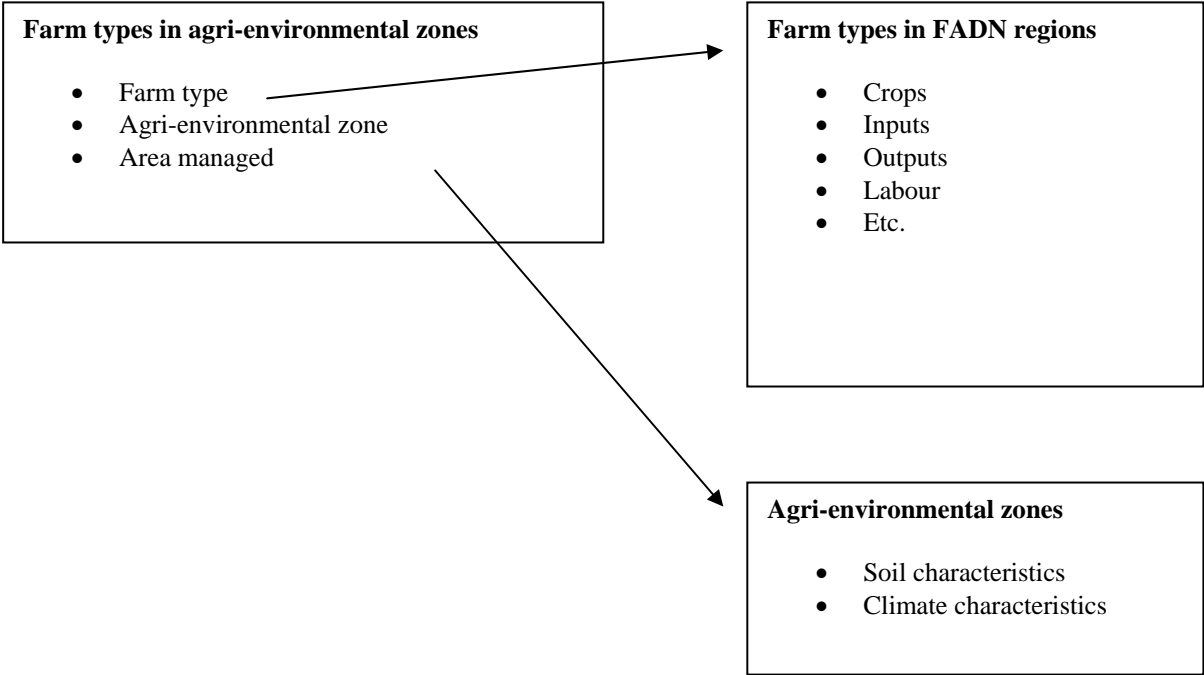


Figure 13.2 Illustration of the links and descriptions of farm types and agri-environmental zones in the SEAMLESS database

¹ See http://www.ilr1.uni-bonn.de/agpo/rsrch/dynaspat/dynaspat_e.htm

The relations and descriptions of farm types and agri-environmental zones in the SEAMLESS database are summarised in figure 13.2. The information for farm types in agri-environmental zones includes only one variable: The area managed. This part of the database includes information on all farm types present. The area within one agri-environmental zone is managed by several farm types and one farm type in most cases will manage land in different agri-environmental zones. This information on the distribution of farm types within agri-environmental zones is linked to one agri-environmental zone with a specific description of soil and climate characteristics. The relation to the more detailed descriptions of the farm types is more complicated. This information comes from the FADN data that have been processed to the SEAMLESS farm typology and are included at the level of the FADN regions, but of course only for farm types based on more than 15 sample farms. One description of a farm type in the FADN regions represents this specific farm type wherever it occurs in an agri-environmental zone within this FADN region. Presently, these links between farm types in the agri-environmental zones and at the FADN region level are only included in the database for farm types with more the 15 sample farms at FADN region level. However, we are presently exploring the options to link additional farm types at agri-environmental zone level to the detailed descriptions. Several options are explored including linking to farm types at national level or linking to less detailed farm types, both options in an attempt to exceed the threshold of 15 sample farms.

13.3 Some results: FADN data on agri-environmental zones

In this section some examples are given that illustrates how the database can be used to link the farm type information, including FADN data, to agri-environmental zones. The specific results should be evaluated with caution as the work on the allocation of farm types to agri-environmental zones is still in progress.

The first example illustrates how SEAMLESS farm types are distributed in space using the example of the distribution of low intensity farms on agri-environmental zones in the Northern part of the United Kingdom and in Ireland (see figure 13.3). The highest share of low intensity farms are found in the highlands and islands of Scotland, where more than 90% of the agricultural area is managed by low intensity farms. The lowest share of low intensity farms are found in the most Southern regions of England included in the map, where the area managed by low intensity farms fall below 5% in some agri-environmental zones. A feature on the map that catches the eye is the link between low intensity farming and the national parks in Northern England. The share of low intensity farming is higher in the agri-environmental zones overlapping the national parks of the Yorkshire Dales, the Lake District, North Yorkshire Moors and the Peak District. The map also shows some features that points to improvement of the methods used to allocate the farm types. An example is the many abrupt changes along the borders of the administrative regions of Ireland and Northern Ireland, which probably cannot be found on the ground. However, this might also be a consequence of forcing the data to fit to a combination of administrative and biophysical borders.

The second example on the use of the SEAMLESS database is on livestock density in the Netherlands. This example is based on the variables 'total livestock units' and 'util-

ised agricultural area' taken directly from the FADN data processed to SEAMLESS farm types and used to calculate the livestock density per agri-environmental zone. This calculation is based on the share of the area in the agri-environmental zones managed by a specific farm type and the livestock density on this farm type. As can be seen from figure 13.4 the highest livestock density can be found in small spots in the region of Gelderland (A on the map) with more than 16.5 LU/ha. Agri-environmental zones with high densities can also be found in agri-environmental zones in Limburg, Utrecht, Noord-Brabant and Overijssel. The regions to the West and North of the Netherlands in general have lower livestock densities.

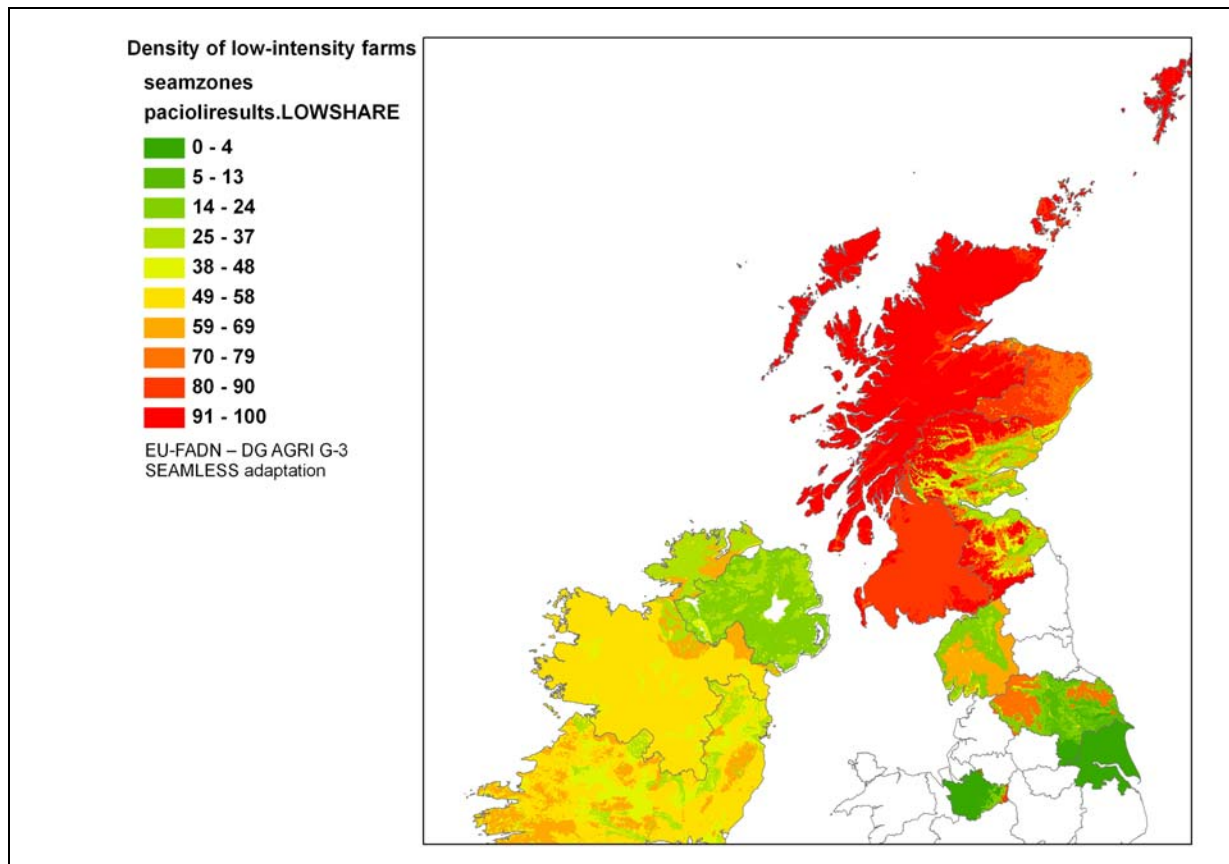


Figure 13.3 The share of the agricultural area managed by low intensity farms in agri-environmental zones in Northern United Kingdom and Ireland

Source: SEAMLESS database.

A third example shows the share of the agricultural area of agri-environmental zones dominated by a certain texture class managed by low, medium or high intensity farms (table 13.1). The table is based on results for app. half of the agricultural area of the old Member States (EU15), for which we have finalised the allocation of farm types to agri-environmental zones. As can be seen the highest share of agricultural land managed by high intensity farms can actually be found on what is normally considered as the most

marginal texture classes: the coarse sandy soils and the peat soils. Probably this can be explained by a higher presence of farm types with husbandry. Peat soils is the texture class with the most diverse management in terms of intensity as this is also the class where the highest share of the area is managed by low intensity farms. The highest share of agricultural land managed by medium intensity farms can be found for the agri-environmental zones where medium fine soils are dominating, whereas this share is decreasing for both coarser and finer texture types and peat soils. Repeated at a more detailed spatial level this exercise could be used to identify for example hot spots with farm types with a high risk of nitrogen surplus and vulnerable agri-environmental zones with a high risk of nitrogen leaching such as sandy soils.

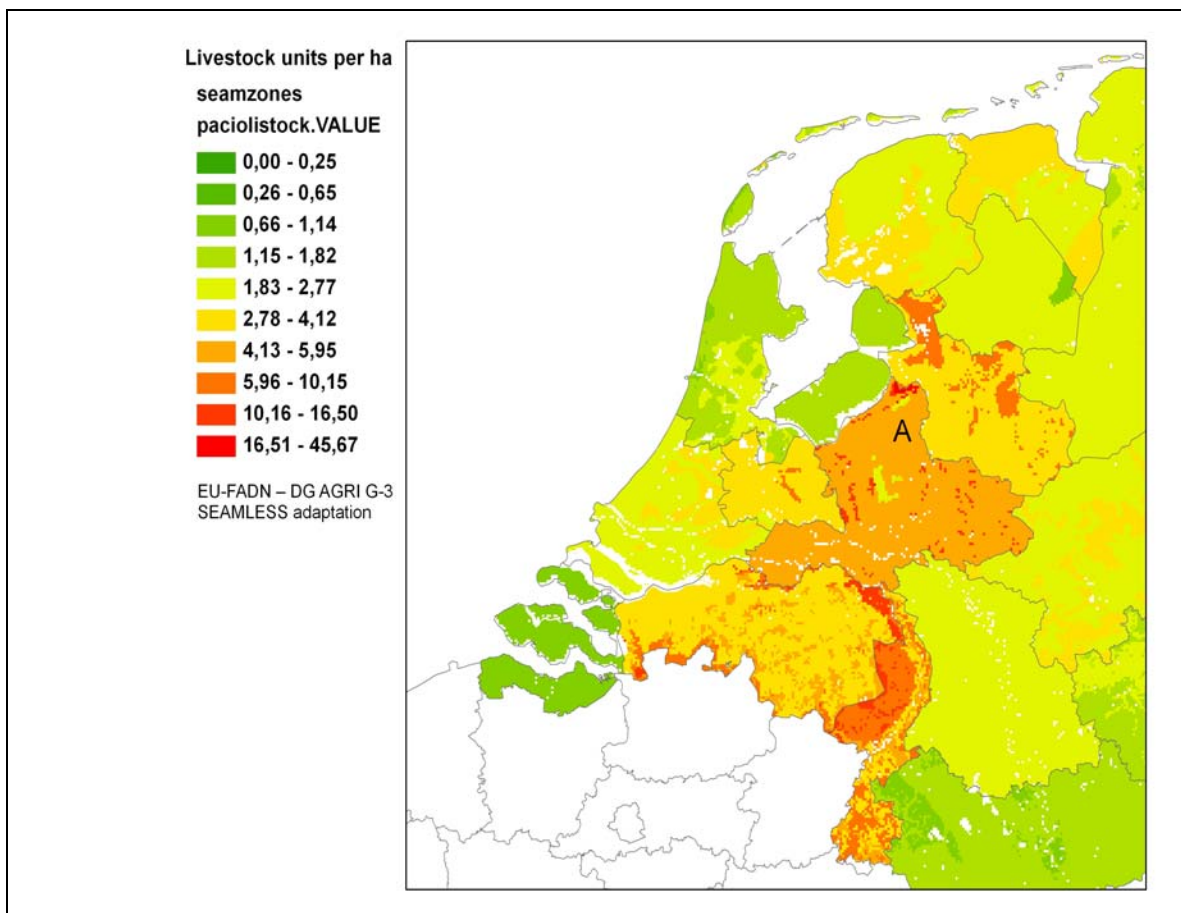


Figure 13.4 Livestock density per agri-environmental zone in the Netherlands
 Source: SEAMLESS database.

Table 13.1 The share of the area of agri-environmental zones dominated by a certain soil texture and managed by farm types of a certain intensity of farming. Based on data for app. 50% of the agricultural area of EU15

	Low intensity (%)	Medium intensity (%)	High intensity (%)
Coarse soils	16	60	24
Medium	25	62	14
Medium fine	9	76	15
Fine	19	64	17
Peat soils	38	31	31
Total	21	62	17

Source: SEAMLESS database.

13.4 Conclusions

The SEAMLESS project deals with integrated modelling for which the combination of detailed data on farming and on the environment is crucial. Achieving this at the level of relatively homogenous biophysical units covering the entire territory of the European Union was one of the major challenges in the project. The previous sections have described how this has been achieved and some examples of the results. The integrated database that has been developed will serve as input to modelling at different levels from crop modelling (mainly biophysical data), farm type modelling (both farm type and biophysical data) and marked level modelling (mainly farm type data). Through the spatial framework and the farm typology used to process the data, the different levels of modelling will also be combined.

The examples of results on the linkage of FADN data to agri-environmental zones given in section 3 show the potential of the approach followed in SEAMLESS, where we can assess farming in very detailed biophysical endowments. One of the next steps in the work will be not only to linked data based on FADN, but also the outputs of modelling to the agri-environmental zones. This will provide new options for ex-ante assessments of agricultural and environmental policy instruments.

An important extension of the approach is also planned within the duration of the project allocating the farm types to other spatial units than the agri-environmental zones. This could for example be an allocation of the farm types to Nitrate Vulnerable Zones, Natura 2000 areas or other designated areas, enhancing the options for policy relevant assessments. However, the exact content of this work is still to be detailed.

Finally, it should also be mentioned that within SEAMLESS the prime goal is to optimise the database to the modelling framework. This has some implications, especially in terms of metadata to be included in the database. However, it is planned also to develop a stand alone version of the database that includes the additional metadata needed for external users to interpret the content of the database. This also includes documentation of the use of the database, but no specific tools will be developed for the external use. Both free and commercial tools already exist, that can be used to access the database. It is planned to make the final version of the database available on the web, but the long term maintenance is still unclear.

Acknowledgement

This work has partly been carried out as part of the SEAMLESS Integrated Project, EU 6th Framework Programme, Contract no. 010306-2.

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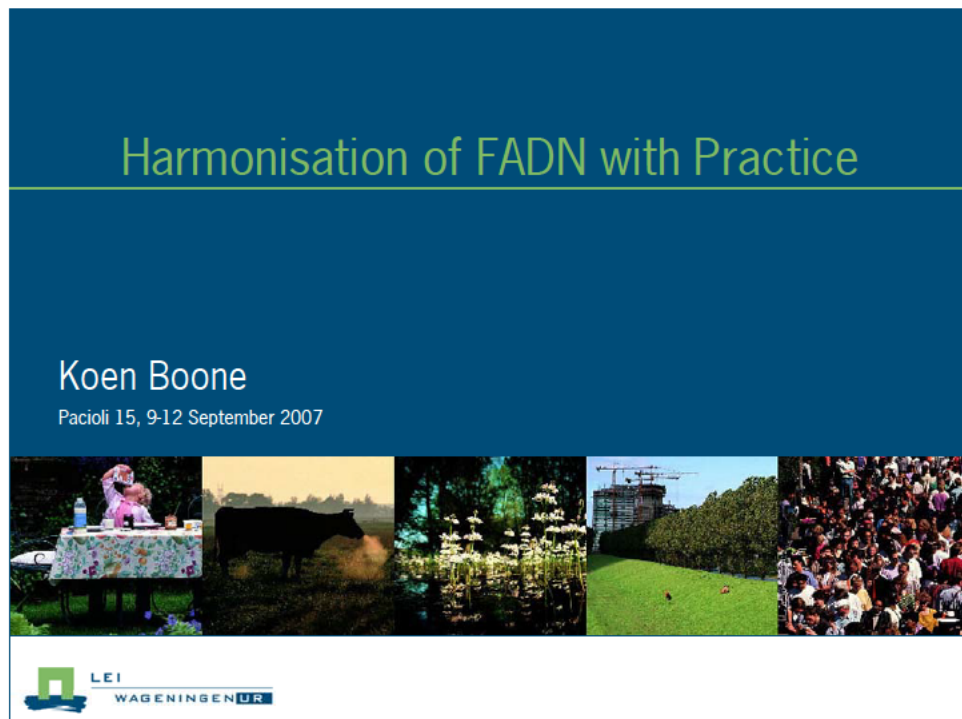
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14. Harmonisation of FADN with practice

Koen Boone, LEI



Harmonisation of FADN with Practice

Koen Boone
Pacioli 15, 9-12 September 2007



Content

- Why harmonise?

Harmonisation of:

- Accounting standards
- Financial reporting
- Ledger (system of accounts)
- Invoices: EDI circle



Why harmonise with practice (1)?

Dutch FADN

- Data is assembled by employees of LEI
- Data is assembled on a very broad range of subjects and on a very detailed level (individual invoices)

Always a need to harmonisation:

- easier to understand for users of FADN (including farmers)
- comparison between different databases and countries
- Etc.



Why harmonise? – ‘New’ reasons

- Growing availability of data in electronic format
- Growing technological possibilities to exchange data (see Pacioli 14: External data)
- Growing need to compare data with
 - Other sectors
 - Other countries
 - Other databases
- Decreasing FADN budgets and administrative burden

Harmonisation of accounting standards

- Dutch FADN: IAS 41 ‘Agriculture’ and other standards of International Financial Reporting Standard (IFRS).
 - IFRS standards accepted by EU and obliged for all stock listed companies.
- But currently...
- Not much used by farmers
 - Not relevant for fiscal accounting
 - Not much used in statistics (for example EU-FADN)

Harmonisation of Financial reporting: XBRL

Firms deliver three times financial data to:

- Chamber of Commerce
- Central Statistical Office
- Tax authority

XBRL: Development of dictionary of financial terms and format (XML)

Result:

- Only one dataset has to be delivered
- Harmonisation of definitions between 3 organisations
- Financial software is adapted so that dataset is automatically created from own financial administration.

Development of an XBRL extension for agriculture



Harmonisation of Financial reporting: Fiscal data

- Central Statistical Office has database with fiscal data of all agricultural farms
- Limited information about type of farming, % of output from farming etc.
- Coupling of fiscal data with data of farm census via Central Registration of firms at Chamber of Commerce (CC)
- Limited number of farms registered at CC: 13.000
- From 2008 on: All farms are included in CC register



Harmonisation of ledger (system of accounts)

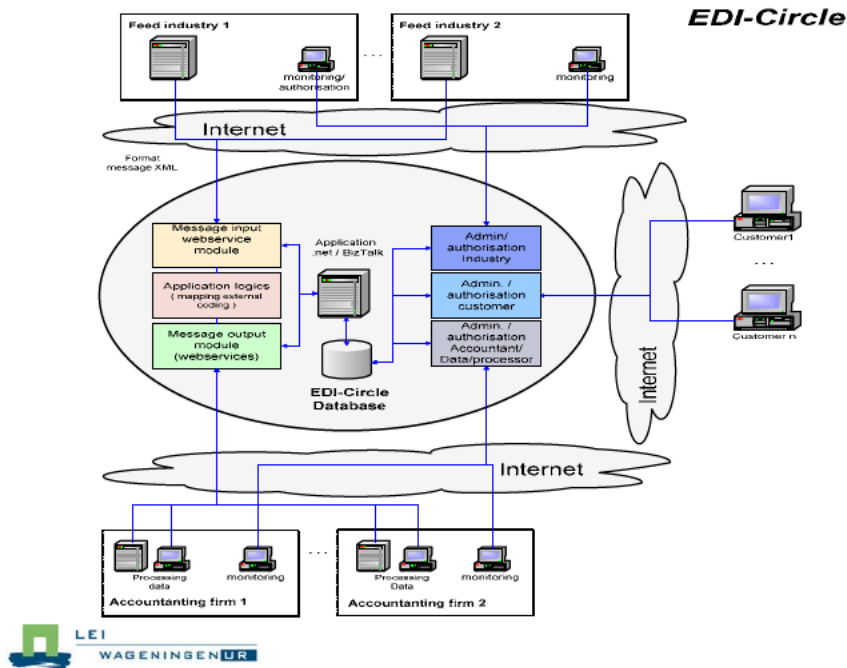
- '80/'90 Development of GRAS by LEI and accounting offices (Uniformed system of accounts for agriculture)
- No central maintenance: different versions of GRAS
- Now much more detailed information available
- 2000: LEI developed very detailed data model
- June 2007: Organisation of Accounting offices (SRA) updates GRAS based on Data model LEI
- LEI responsible for maintenance



Harmonisation of Invoices FDI-Circle

- Co-operation of 5 accounting offices, 5 feed producers, IT company and LEI
- Fixed electronic format for invoices
- Feed producer sends invoice to central database
- Access of database by internet for farmer
...and with authorisation from farmer for accounting office, LEI and others.





EDI- circle at the LEI

■ Adapt software

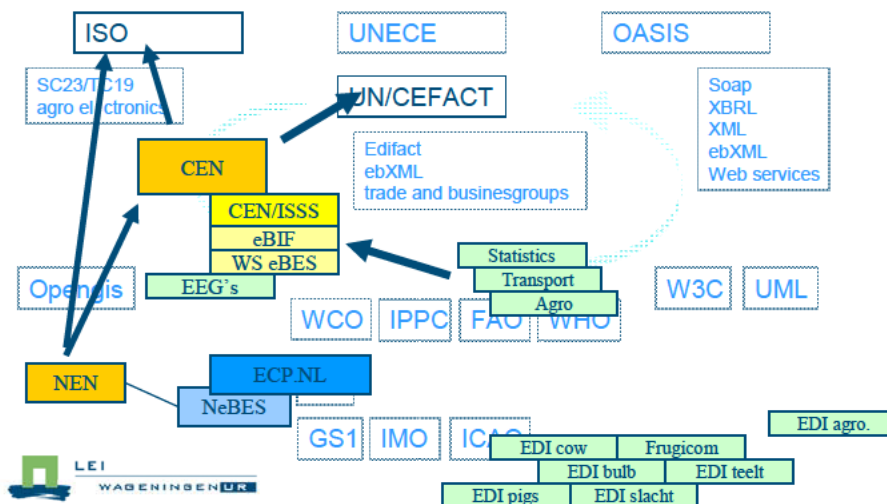
Now:

- Every morning system checks if new invoices are available
- Invoices collected and data integrated in FADN database
- Code of type of feed of supplier is centrally coupled to LEI list of types of feed.
- Invoice is presented to LEI employee and coupled with payment

Current state and future developments

- New members: Dairy industry (all), suppliers for horticulture and fishing, other accounting offices
- Potential new members: Flower and fish auctions, potato processor
- Organisation for quality certification of Dairy farms (OCM): origin of feed in case of quality problems with feed.

Harmonisation Organisations



Conclusions

- Harmonisation with practice is getting more important:
 - Efficient and timely assembling of data
 - Use of FADN in combination with other data
- Harmonization makes it possible to exchange (very detailed and timely) data at low costs...
 - ... and helps competitors of FADN
- Harmonisation at which level?

15. Possible effects of CAP on Estonian FADN

Eduard Matveev, Rural Economy Research Centre

PACIOLI-15 Workshop
Aulanko, FINLAND 9 – 12 September 2007

Possible effects of CAP in Estonian FADN

Eduard Matveev
Rural Economy Research Centre

FADN network in Estonia

- The database was set up in 1996 (50 sample farms)
- Since 2000 data have been collected from 500 sample holdings i.e 7.3% of the population of agricultural holdings.
- Since 2001 responsible for FADN in Estonia have been Rural Economic Research Centre (former Jäneda Training and Advisory Centre)
- Rural Economy Research Centre has been appointed as the **Liaison Agency** in 2004



Population and sample of agricultural holdings in Estonia

There are 37,000 agricultural holdings in Estonia, of which 6,809 agricultural holdings exceed the threshold of the economic size of 2 ESUs.

The population of agricultural holdings covers 83.1% of the standard gross margin of Estonian agricultural production and 78.2% of the utilized agricultural area.

47.4% of the agricultural holdings of the population of the FADN belong to the smallest economic size class (2 to 4 ESUs).



Changes in the FADN methodology proposed by the Commission (RI/CC 1472)

- The typology will be calculated on the basis of Standard Output (SO) coefficients instead of Standard Gross Margin (SGM);
- Inclusion of a new classification variable Other Gainful Activities (AGA);
- The typology is limited to 3 levels from general to particular types;
- The economic size of the holding is measured directly in euros.

Current and new economic size classes

Size classes with SGM	Min (in €)	Max (in €)
1 < 2	0	2 400
2 2 - <4	2 400	4 800
3 4 - <6	4 800	7 200
4 6 - <8	7 200	9 600
5 8 - <12	9 600	14 400
6 12 - <16	14 400	19 200
7 16 - <40	19 200	48 000
8 40 - <100	48 000	120 000
9 100 - <250	120 000	300 000
10 >=250	300 000	

New classes	Min (in €)	Max (in €)
1	0	2 000
2	2 000	4 000
3	4 000	8 000
4	8 000	15 000
5	15 000	25 000
6	25 000	50 000
7	50 000	100 000
8	100 000	250 000
9	250 000	500 000
10	500 000	750 000
11	750 000	1 000 000
12	1 000 000	1 500 000
13	1 500 000	3 000 000
14	3 000 000	

Comparison of SGM “2000” with SO “2000” (crop production)

Code		Type of production	SGM "2000	SO "2000	SO vs. SGM	
FSS	FADN				in €	%
D/1	120	Wheat	146	193	47	132%
D/3	122	Rye	123	161	38	131%
D/4	123	Barley	124	166	42	134%
D/8	128	Other cereals	131	221	90	169%
D/9	129	Protein crops	174	262	88	151%
D/10	130	Potatoes	705	1 441	736	204%
D/12	144	Forage roots	86	697	611	810%
D/30	132	Other oil seed crops	211	282	71	133%
D/14	136, 137	Fresh vegetables	1 449	2 730	1 281	188%
D/18	145, 147	Temporary grass	80	98	18	122%
G/1	152	Fruit and berry orchards	576	1 013	437	176%

Comparison of SGM “2000” with SO “2000” (livestock production)

Code		Type of production	SGM "2000	SO "2000	SO vs. SGM	
FSS	FADN				in €	%
J/2	23+24	Calves for fattening	69	170	101	246%
J/4	26	Female cattle, 12...24 months	55	171	116	311%
J/6	28+29	Breeding heifers	26	171	145	657%
J/7	30+31	Dairy cows; cull dairy cows	523	786	263	150%
J/8	32	Other cows	84	172	88	204%
J/9	40, 41	Sheep (all ages)	20	38	18	192%
J/10	38, 39	Goats (all ages)	35	49	14	141%
J/11	43	Piglets, living weight < 20 kg	10	29	19	290%
J/12	44	Breeding sows, > 50 kg	190	606	416	319%
J/13	45+46	Other pigs, > 20 kg	10	69	59	687%
J/14	47	Broilers	3	12	9	408%
J/15	48	Laying hens	4	15	11	369%
J/18	33	Bees	35	73	38	208%

Changes by General Type of farming (SO 2000), 2005

Type of farming with SGM	Total number of farms with SGM	Farms lost	Farms added	- lost + added	change by TF	Total number of farms with SO
1 Field crops	186	22		-22	-11,8%	164
2 Horticulture	14		2	2	14,3%	16
4 Permanent crops	9		1	1	11,1%	10
5 Milk	187	9	6	-3	-1,6%	184
6 Grazing livestock	13		17	17	130,8%	30
7 Granivores	11		4	4	36,4%	15
8 Mixed	80	22	23	1	1,3%	81
All	500	53	53		10,6%	500

Changes by General Type of farming (SO 2000, new typology), 2005

Type of farming with SGM	Total number of farms with SGM	Farms lost	Farms added	- lost + added	change by TF	Total number of farms with SO
1 Field crops	186	38		-38	-20,4%	148
2 Horticulture	14		2	2	14,3%	16
4 Permanent crops	9		1	1	11,1%	10
5 Milk	187	8	22	14	7,5%	201
6 Grazing livestock	13	2	16	14	107,7%	27
7 Granivores	11		4	4	36,4%	15
8 Mixed	80	33	36	3	3,8%	83
All	500	81	81		16,2%	500

Distribution of the holdings by type of farming and size class (SGM 2000), 2005

Type of farming with SGM	Size classes with SGM										All	
	2	3	4	5	6	7	8	9	10			
1 Field crops	14	11	20	31	16	53	35	6			186	37%
2 Horticulture	2	2	2	2	2	3	1				14	3%
4 Permanent crops	2	1	2	1	1	2					9	2%
5 Milk	8	26	15	30	16	60	12	13	7		187	37%
6 Grazing livestock	8	1	3		1						13	3%
7 Granivores	1					5	1	2	2		11	2%
8 Mixed	18	7	4	9	4	15	10	8	5		80	16%
All	53	48	46	73	40	138	59	29	14		500	
	11%	10%	9%	15%	8%	28%	12%	6%	3%			

Distribution of the holdings by type of farming and size class (SO 2000), 2005

Type of farming with SO	Size classes with SO														All		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14			
1 Field crops			6	21	31	36	32	20	2							186	37%
2 Horticulture			2	6	2	5	1									14	3%
4 Permanent crops			2	2	2	3	1									9	2%
5 Milk			4	30	37	51	40	22	10	4	2	1				187	37%
6 Grazing livestock			3	10	9	4	1									13	3%
7 Granivores				1			1	5	3	3		2				11	2%
8 Mixed			13	17	13	17	11	3	5	3	1					80	16%
All			30	87	94	116	87	50	20	10	3	3				500	
			6%	17%	19%	23%	17%	10%	4,0%	2,0%	0,6%	0,6%					

87%

7%

Structure of the sample by type of farming and other gainful activity class

Type of farming with SO		AGA classes			All
		-<=10%	10-<=50%	50-<100%	
1	Field crops	93	53	2	186
2	Horticulture	10	6		14
4	Permanent crops	7	3		9
5	Milk	172	29		187
6	Grazing livestock	17	10		13
7	Granivores	12	3		11
8	Mixed	66	16	1	80
All		377	120	3	500
		75,4%	24,0%	0,6%	

16. Income Volatility in the EU

Hans Vrolijk, LEI

The image shows the cover of a report. The main title is 'Income Stabilisation' in a large, white, sans-serif font. Below it, the subtitle 'Design and economic impact of risk management tools' is written in a smaller, white, sans-serif font. The website address 'www.incomestabilisation.org' is centered below the subtitle. The author's name 'Dr Hans C.J. Vrolijk' and affiliation 'LEI, The Hague' are listed below the website. The date and location 'Aulanko, Suomi, September, 2007' are at the bottom of the main text area. The cover features a dark blue background for the main text, a yellow horizontal band at the bottom, and a blue band with the European Union flag on the left. The logo for 'SCIENTIFIC SUPPORT TO POLICIES' is on the right.


Income Stabilisation
Design and economic impact of risk
management tools

www.incomestabilisation.org

Dr Hans C.J. Vrolijk
LEI, The Hague

Aulanko, Suomi,
September, 2007

 **Income Stabilisation In European Agriculture**
Design and economic impact of risk management tools


**SCIENTIFIC SUPPORT
TO POLICIES**

Objective

to analyze income volatility and income crises
in agriculture based on FADN data



Income Stabilisation In European Agriculture



Approach to the problem

- EU FADN data
- Data from 1990 – 2004
- Normal income fluctuations – income crises
- Analysis of structure, and volatility of prices and yields for models
- Report on historic data focuses on analyses of volatility of production and income



Income Stabilisation In European Agriculture



Level of analysis

■ Fluctuations of incomes

- Development of average income of groups of farms
- Between farm differences
- Within farm fluctuations
 - Within farm income changes over years
 - Differences in regions and types of farming
 - Stability of income distribution

■ Crisis

- Case descriptions
- Impact of crisis on financial condition of farm

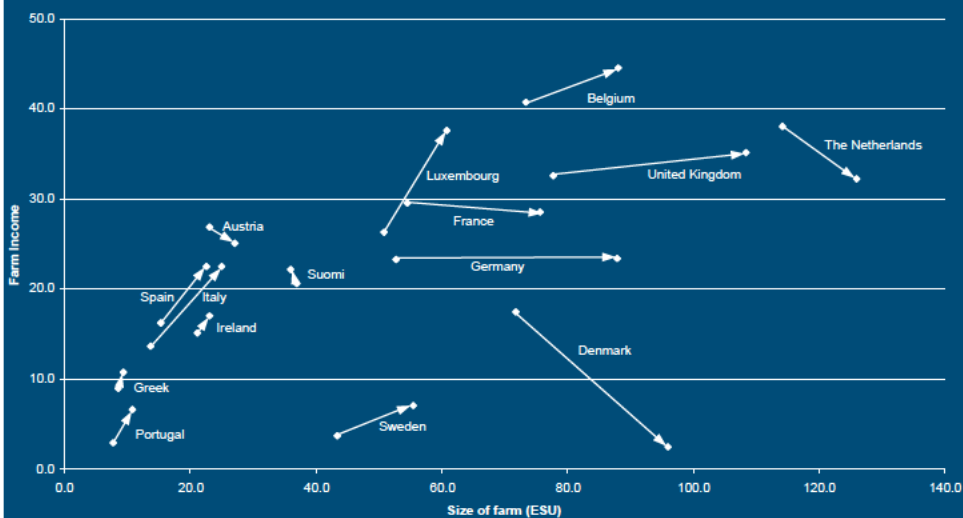


Income Stabilisation In European Agriculture



Development of incomes (EU15)

Development of farming in the EU15



Income Stabilisation In European Agriculture



Large differences between economic performance of farms

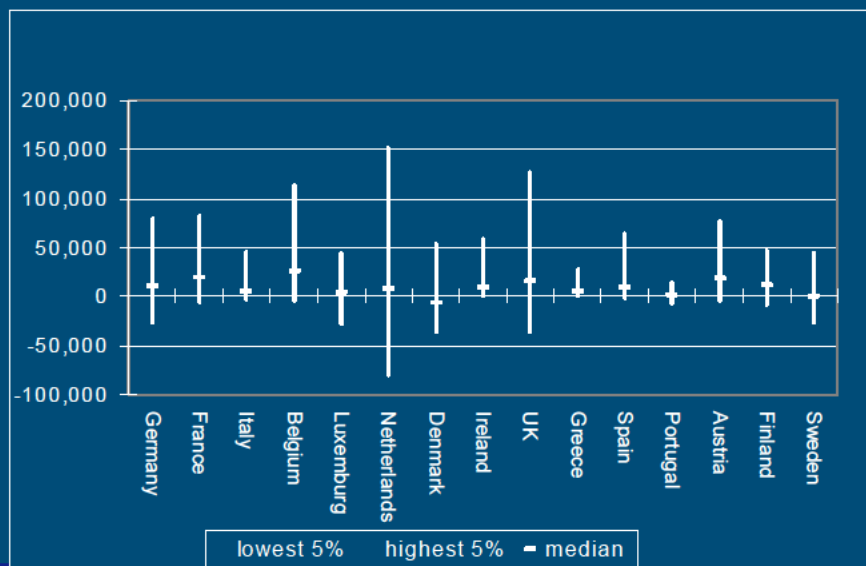
- Size of farm
- Local circumstances
- Type of production
- Management skills
- Financial structure of farm



Income Stabilisation In European Agriculture



Development of incomes (between farm differences)

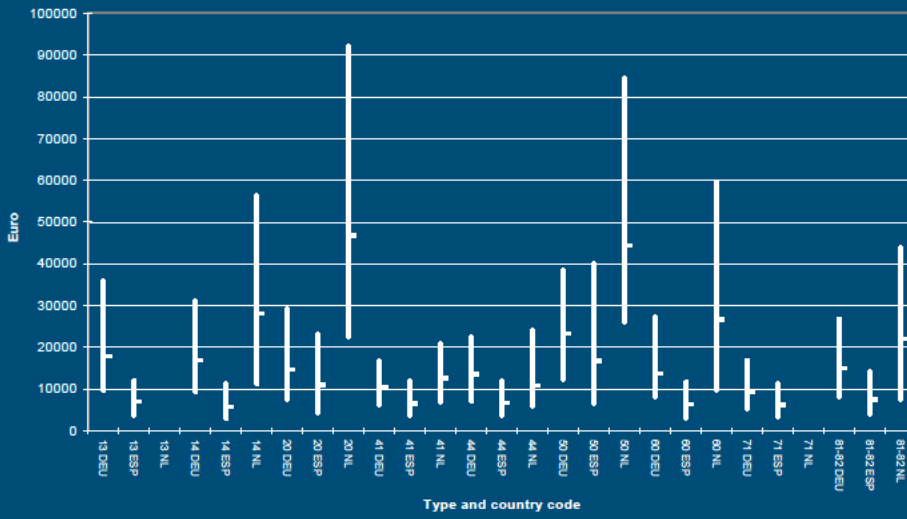


Income Stabilisation In European Agriculture



Fluctuations of incomes (within farm variation)

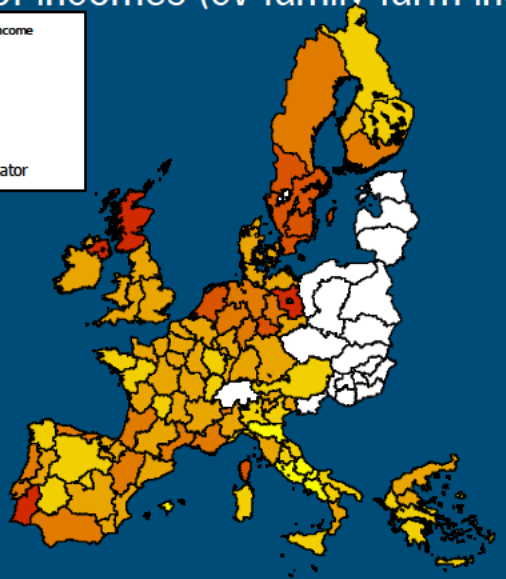
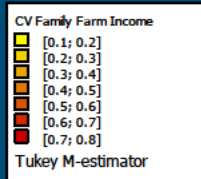
Within farm income changes per year



Income Stabilisation In European Agriculture



Fluctuations of incomes (cv family farm income)



Income Stabilisation In European Agriculture



Volatility in specialised pig sector



Income Stabilisation In European Agriculture



Income crisis

- No indicator for crisis in FADN
 - Aggregation of all effects
 - Indirect indicators not easy to use
- Case descriptions
 - Use of additional information
- Modeling approach
 - Degree of financial robustness of farms



Income Stabilisation In European Agriculture

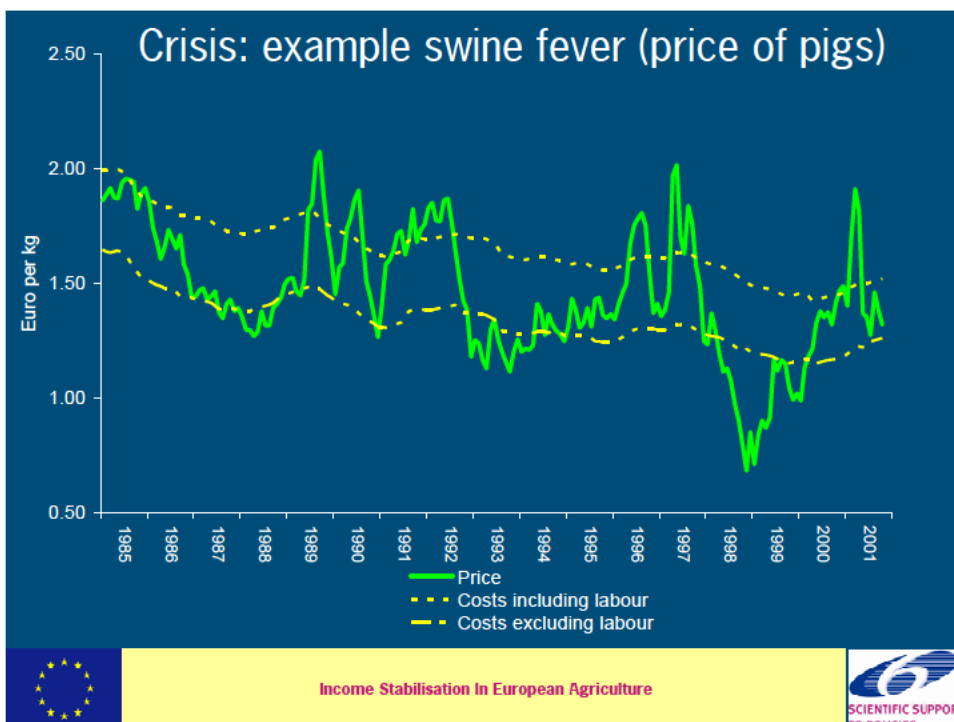


Crisis: case descriptions

- Swine fever in pig sector in the Netherlands
- Rainfall in the arable sector in the Netherlands
- Drought in arable sector in Spain
- Drought in arable sector in France
- BSE and cattle farmers in Germany
- BSE and cattle farmers the UK



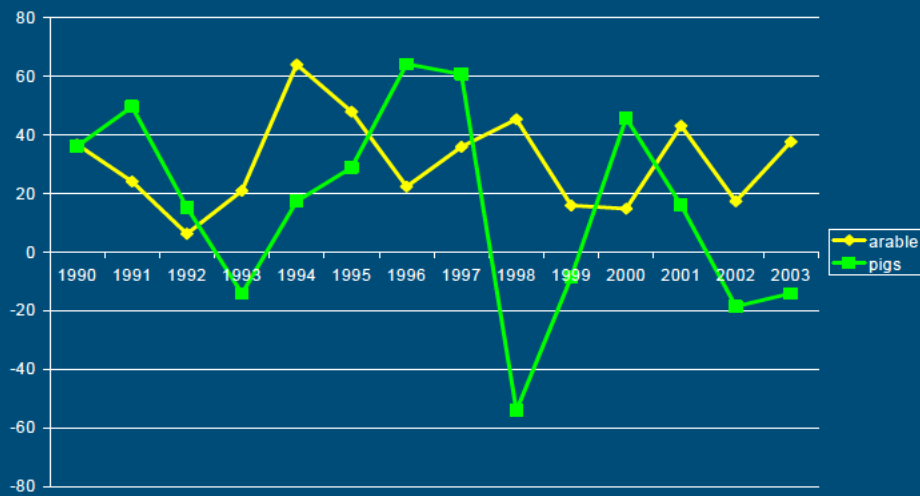
Income Stabilisation In European Agriculture



Income Stabilisation In European Agriculture



Impact of external crises, a case study



Income Stabilisation In European Agriculture



Income crises

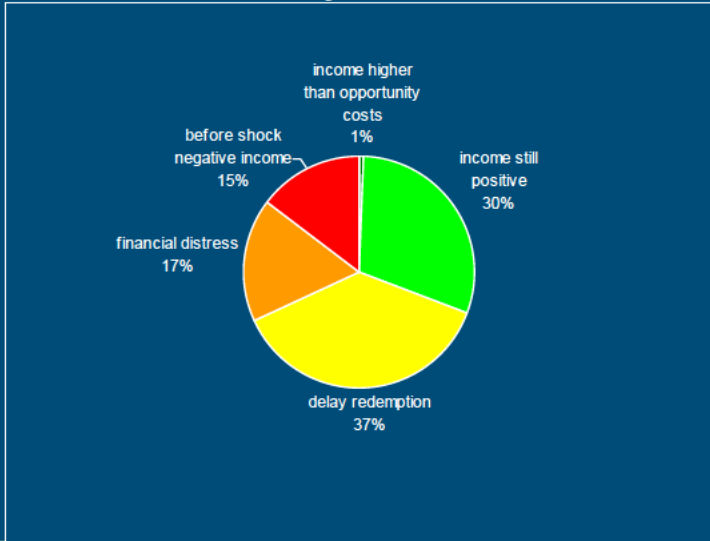
- Extent to which external events results in income crisis
- Calculation
 - Average production value of 3 years
 - Standard deviation of production value
 - Impact of external crises on the output value (30% decrease)
 - Simulated farm income
- Simulated farm income: five categories
 - Family farm income higher than opportunity costs
 - Family farm income after crises above zero;
 - Family farm income plus depreciation is still positive after crises
 - Farm in financial distress due to crises;
 - Negative income (even without crises)



Income Stabilisation In European Agriculture



Income crisis (Germany arable farms)

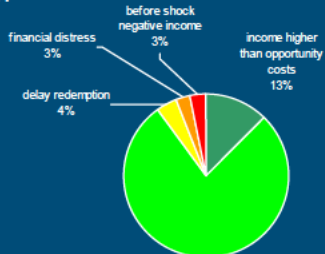


Income Stabilisation In European Agriculture

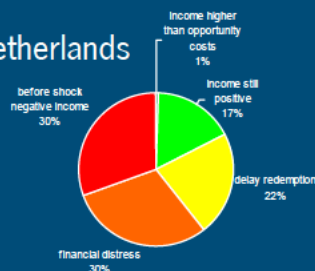


Income crises (arable)

Spain



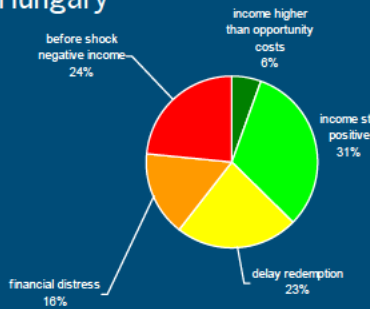
Netherlands



Germany



Hungary



Conclusions

- Strong fluctuations in average and median incomes; averages 'hide' fluctuations at farm level
- Large changes in farm income and relative income position at farm level
- Large differences in financial robustness of farms to cope with external events
- FADN provides detailed information to monitor income and low income situations
- FADN primarily aimed at financial economic information
- FADN shows impact of crisis on farm level, direct impact and market response, but no indicator of external events in dataset
- Limitations as a tool for assessment of crisis risk management actions by government



17. Results of a survey about methodology in national FADNs

Kaspar Muehlethaler, ART¹

17.1 Summary

Switzerland collects and evaluates accounting data from farms. To allow Swiss data collection methods to be compared with those of other European countries, nine European countries completed a questionnaire.

Each country concerned has a minimum size threshold for the inclusion of farms in its field of survey. In some cases farms are also excluded for the following reasons: too big, involved in fringe activities or having special forms of organisation.

The samples cover all strata. However, the number of farms per stratum differs. Half of the countries use a selection procedure based on random sampling. A systematic rotation of the farms surveyed is not consistently applied in any of the countries.

Some evaluating institutions work with other bodies that are organisationally independent from them, while others collect the data themselves. Tax accounting is compulsory in some countries but does not serve as the sole source of survey data in any country.

Farmers receive financial compensation only in the three German-speaking countries. However, in all countries except for Denmark, it is customary for the farmer to receive an evaluation of his own farm. Other incentives are also encountered.

A balance sheet and some form of profit and loss account are drawn up in all of the countries. In some cases the income from non-agricultural activities and the private consumption of the farm manager's family is also taken into account.

The results of the questionnaire provide an initial overview of the differences and similarities between the methodologies used by the various countries concerned.

Keywords: Farm accountancy data collection, methodology, questionnaire, Europe

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Abbreviations

ART	Agroscope Reckenholz-Tänikon Research Station ART, Switzerland
CHF	Swiss francs
ESU	European Size Units (for the definition of farm sizes), in euros
FADN	Farm Accountancy Data Network (a European Union project)
nR	Country not using random farm sampling
SGM	Standard Gross Margins, in euros
R	Country using random farm sampling

17.2 Introduction

Like other European countries, Switzerland collects and evaluates farm accountancy data. One of the main aims in doing so is to record the current economic status of Swiss agriculture. The data is evaluated by the Agroscope Reckenholz-Tänikon (ART) Research Station, which forms part of the Federal Office of Agriculture.

In order to compare its own data collection methods with those of other European countries, the ART sent a questionnaire to 19 countries in June 2007. The following nine countries replied:

- Austria;
- Belgium (Flanders only);
- Denmark;
- England (part of the United Kingdom);
- Finland;
- Germany;
- Hungary;
- Italy;
- Netherlands.

Croatia also replied. The data collection system there in according to the EU-requirements will be built up during 2008.

This document sets out the most important results and conclusions emerging from the questionnaire.

First-hand information on individual countries must be requested directly from the countries concerned. In Section 5, there is a list of all persons who completed the questionnaire.

17.3 Results of the questionnaire

17.3.1 Field of survey

The field of survey comprises all farms that qualify as survey material in principle, taking account of given delimitation criteria (e.g. minimum farm size).

Each country sets a *minimum size limit* below which a farm is excluded from the field of survey. Both financial and non-financial criteria are used (figure 17.1):

- financial criteria always consist of Standard Gross Margins (SGMs), which are mostly expressed in European Size Units (ESUs);
- as a non-financial criterion Switzerland uses 11 thresholds relating to the size of agricultural land or livestock numbers, of which at least one must be exceeded. England worked with SGMs until the 2003/04 financial year, since which time it has been using the non-financial criterion of Standard Labour Units (SLUs). For the Farm Accounting Data Network (FADN), England continues to use ESUs in accordance with EU requirements;
- in Denmark, either a given Standard Gross Margin (financial criterion) or a given surface area (non-financial criterion) must be exceeded.

Financial criterion	Austria, Belgium (Flanders), Finland, Germany, Hungary, Italy, Netherlands
Non-financial criterion	Switzerland (surface area and livestock numbers), England (Standard Labour Units)
Both	Denmark (Standard Gross Margin or surface area)

Figure 17.1 *Minimum farm size for inclusion in the field of survey*

The overall technical and economic evolution of the sector can result in a given farm that used to generate an adequate income becoming too small to secure a living for the farmer. The average farm size is thus increasing in most areas. It would therefore be conceivable, in principle, to directly raise the minimum farm size over time to take this trend into account. At the present time none of the countries surveyed makes regular and systematic use of this possibility. Adjustments are possible by indirect means:

- if the Standard Gross Margins used are regularly recalculated. The trend towards falling product prices and rising costs is resulting in farms having to be bigger in order to achieve the same Standard Gross Margins;
- if the SLUs are regularly adjusted to reflect technical advances. This results in increasingly large farm units being able to be run by the same number of SLUs.

Three countries have defined a *maximum farm size* in addition to a minimum farm size (figure 17.2). The threshold here is always an SGM (e.g. expressed in ESUs). The reasons indicated for the introduction of this maximum size limit are that farms exceeding the maximum threshold are either difficult to reach or their unique character prevents them from being included in the classification system.

Maximum farm size	Austria, Belgium (Flanders), Netherlands
No maximum farm size	Denmark, England, Finland, Germany, Hungary, Italy, Switzerland

Figure 17.2 *Maximum farm size for acceptance in the field of survey*

It is not as easy to obtain accounting figures for some types of farm as for others. For example, in Switzerland it is difficult to recruit specialist vegetable-growing, horticultural and pig farms. It would be conceivable to exclude these types of farm group from the field of survey in the same way as small farms are excluded as in any case little data is available from them. The questionnaire shows that this practice is applied mainly in the case of agricultural fringe activities and special forms of organisation. Forest holdings and purely horticultural businesses were cited as examples in the questionnaire, as well as non-commercial public institutions, legal persons and bodies.

One could also exclude certain farm groups after the survey on the grounds that it has proven impossible to obtain sufficient or even any data for them. According to the questionnaire, this is not done in any of the countries concerned.

The field of survey never covers the total agricultural population of a given country owing, among other things, to the minimum size threshold. The four tables below show the coverage of the total agricultural population by the field of survey for various variables. In interpreting the results it is important to bear in mind that the coverage is, of course, determined by the definition of the total agricultural population.

Table 17.1 shows that the field of survey covers between 13% and 82% of all farms of the total agricultural population, depending on the country concerned. This figure is below 50% for Hungary and England. However, as these countries' agricultural sectors are characterised by a high proportion of small farms, the coverage in terms of utilised agricultural area, percentage of animals and percentage of overall gross margins is still well above the 80% level.

Table 17.1 Coverage of the total agricultural population - Number of farms

Country	Coverage (%)	Country	Coverage (%)
Switzerland	82	Austria	56 (rural farms)
Denmark	81	England	35
Netherlands	77 (farms < 1'200 ESUs)	Hungary	13
Belgium (Flanders)	62	Germany	unclear
Finland	62	Italy	no reply

Table 17.2 shows the proportion of utilised agricultural area covered by the field of survey. The results are above 85% in all cases.

Table 17.2 Coverage of the total agricultural population - Proportion of the utilised agricultural area

Country	Coverage (%)	Country	Coverage (%)
Denmark	98	Belgium (Flanders)	90
Switzerland	96	Austria	86
England	95	Finland	86
Netherlands	94 (farms < 1'200 ESUs)	Germany	no reply
Hungary	91	Italy	no reply

Table 17.3 shows that, in the majority of cases, over 90% of animals (expressed in livestock units) are covered by the field of survey. At 82% Hungary is the only country that falls below this figure.

Table 17.3 Coverage of the total agricultural population - Proportion of animals (in livestock units)

Country	Coverage (%)	Country	Coverage (%)
Denmark	99	Austria	92
Finland	97	Hungary	82
Switzerland	97	Germany	no reply
Netherlands	>95 (farms < 1'200 ESUs)	England	no reply
Belgium (Flanders)	94	Italy	no reply

In every country, the field of survey covers at least 87% of the overall Standard Gross Margin (expressed in European Size Units, ESUs)

Table 17.4 Coverage of the total agricultural population - Percentage of the overall Standard Gross Margin (in ESUs)

Country	Coverage (%)	Country	Coverage (%)
Denmark	99	Belgium (Flanders)	89
Switzerland	97	Austria	89
England	96	Hungary	87
Finland	93	Germany	no reply
Netherlands	91 (farms < 1'200 ESUs)	Italy	no reply

In Switzerland the farm data is obtained by private accounting offices, which are also responsible for recruiting the farms for the survey. There is a certain delay between the specification of a reference sample by the evaluating institution and the recruitment of the corresponding farms. The possibility of estimating the future field of survey in advance has therefore been discussed in Switzerland. None of the countries responding to the questionnaire follows this practice.

17.3.2 Stratification

Each country divides its sample into various strata. The number of strata varies widely from one country to another. The following variables are commonly encountered in the stratification system:

- type of farm (all countries);
- size categories (all countries except England);
- regions (six out of the ten countries).

Other stratification variables cited are:

- legal form of the enterprise (legal person: yes/no);
- type of farming (organic/non-organic);

- height classes;
- type of business (main source of farmer's income/part-time business).

The percentage of farms per stratum is determined in different ways. There are basically two possibilities:

- same percentage of farms in each stratum (proportional allocation, e.g. in relation to the number of farms in the field of survey);
- the percentage of farms is optimised for each stratum according to certain criteria and thus differs from one stratum to another (optimal allocation, e.g. taking account of the standard deviation of a variable of special interest).

An overview is provided in figure 17.3. Nine of the ten countries use a form of optimal allocation. Only England uses a purely proportional allocation.

Six of the ten countries use the Neyman-Tschuprow optimal allocation method at least to some extent, whereby the sample size is determined for each stratum taking account of the standard deviation of a variable of special interest (figure 17.4). Three of these six countries also use a proportional allocation method alongside it. Denmark, Germany and the Netherlands each use their own optimal allocation methods.

At least four countries supplement the formalised method with 'manual' adjustments. The following reasons were given for this practice:

- larger numbers of specialised farms can be obtained;
- a minimum number of farms can be secured for each stratum;
- special evaluations (e.g. for specific regions) can be made;
- larger farms are preferred.

Country	Method
Belgium (Flanders)	Proportional allocation between the main groups 'horticulture' and 'agriculture' according to the SGM. This is done because there are considerable variations in the 'agricultural income' and 'standard labour unit' headings in the 'horticulture' sample so that an excessively high number of horticultural farms compared to the total sample would be selected if an optimal allocation were made. Neyman-Tschuprow optimal allocation within the two groups taking account of 'agricultural income' and 'Standard Labour Unit' variables.
Denmark	The optimal allocation method described here has only been partially implemented to date. The total sample is broken down into individual farm size categories using the following measurement weighted according to the number of farms per stratum: standard deviation of the standard output with reference to a regression line between standard output and SGM. The breakdown into types of farm within the different size categories is then done proportionately to the respective number of farms in the field of survey.

Figure 17.3 Determination of the number of farms per stratum

Country	Method
Germany	<p>The allocation of the total sample size to the different federal states is done in accordance with the principle of comparable precision with an exponent of 0.3 (cf. KRUG & AL., 2001, pages 123ff.). This allocation method is based on an assumed graduation of the relative standard error of a reference criterion between the strata, in each case depending on the mean values of the stratum for this criterion. Instead of a concrete allocation criterion, a notional criterion is used here, for which the unitary mean values and variation coefficients are imputed to the different federal states: in other words, the allocation to the states is based exclusively on the number of farms in the field of survey (states with a small number of farms have a higher sampling ratio than those with a large number of farms).</p> <p>Within the federal states themselves, quotas are also set for the individual strata using the principle of comparable precision with an exponent of 0.25. In this case the SGM criterion is used.</p>
England	<p>Proportional allocation with a sampling ratio of three per cent of the farms.</p> <p>'Manual' adjustment: Higher sampling ratio for certain specialised farms, e.g. pigs, poultry or horticulture.</p>
Finland	<p>Mean value between the Neyman-Tschuprow optimal allocation (standard deviation of the 'annual labour unit' variable) and the proportional allocation according to the number of farms.</p> <p>'Manual' adjustment: Each stratum must contain at least 5 farms.</p>
Italy	<p>The total sample size is determined nationally and regionally on the basis of the variation coefficients for the following three variables: SGM, standard output and cost level. No formula specified. 'Manual' adjustment: At least five farms per stratum.</p> <p>Strata containing no or very few farms are eliminated or aggregated with similar strata. Optimal allocation as follows: combination of an interpolation of Neyman-Tschuprow for several variables and a generalisation of the optimal allocation according to Bethel (both really used? The Bethel method is an application of the Neyman-Tschuprow optimal allocation to cases where the optimisation process needs to take account of several different survey variables). Variables taken into account: SGM, standard output and cost level (cf. BETHEL, 1989)</p>
Netherlands	<p>Allocation among types of farm: Based on the relevance in terms of number of farms, economic value and policy measures (formula?).</p> <p>Optimal allocation within farm types, whereby both the lower and upper limits of the stratum (economic size category) and the number of elements per stratum are determined. The variable used here is the SGM (formula?).</p>
Austria	<p>Neyman-Tschuprow optimal allocation (standard deviation of the 'income from agriculture and forestry' variable).</p> <p>'Manual' adjustment: Each stratum must contain at least 15 farms; the available data must allow special evaluations to be made (e.g. mountain farm cadastre groups, federal states, main production areas).</p>
Switzerland	<p>A combination of proportional allocation (4.2% of all farms per stratum) and the average of three optimal allocations done according to Neyman-Tschuprow (standard deviation of the 'agricultural income', 'earnings per family labour unit' and 'farm income' variables).</p> <p>1,000 of the approx. 3,500 farms are 'manually' allocated based on the following criteria: minimum number of farms per stratum, priority to farms with over 20 ha and minimum and maximum quotas for all types of farm in the different height classes and regions.</p>
Hungary	<p>Neyman-Tschuprow optimal allocation (No details of the variables taken into account). The two largest farm size categories (more than 100 ESUs and more than 250 ESUs) were merged into one, as the number of farms within them was too small.</p>

Figure 17.4 Determination of the number of farms per stratum (continued)

The Neyman-Tschuprow optimal allocation is based on the following formula (cf. Cochran, 1972, formula 5.20):

$$n_h = n \frac{N_h S_h}{\sum_{h=1}^L N_h S_h}$$

n_h = Sample size in stratum h

n = Total sample size

N_h = No. of elements in stratum h of the total agricultural population

S_h = Standard deviation of a given target variable in stratum h of the field of survey

Figure 17.5 Neyman-Tschuprow optimal allocation

17.3.3 Sampling

Sampling methods can essentially be divided into two different categories:

- *random sampling*: here, in principle, each farm in a given stratum has the same chance of being selected for the sampling as any other;
- *non-random sampling*: not every farm in a given stratum has the same chance of being selected for the sampling. Farms that are 'easy to recruit' are given preference over those that are not easy to recruit. All countries that use this variant set specific quotas for each stratum. The strictness of compliance with these quotas varies from one country to another.

Half of the countries responding to the questionnaire use a selection process based on random sampling. Among the countries using random sampling, the response rate ranges between 0 and 100%, depending on the country and on the stratum concerned, except in Finland and Italy, where it is unknown. The response rate is unknown in all the countries where random sampling is not used (table 17.5).

Two of the five countries using random sampling have adopted the system fairly recently. Italy implemented the change in 2003, while Finland did so in 1995. We are unable to judge how successful the change was in the context of this report.

Furthermore, Italy is the only one of the ten countries concerned where farmers are obliged by law to take part in statistical surveys. In all the other countries participation is voluntary.

The countries that do not use random sampling explained their choice by the following main arguments:

- it was feared that the non-response rate would be too high (four out of the five countries);
- the statistical office is only able to supply anonymous data, i.e. without names or addresses, because of data protection laws (Hungary);
- for time series analyses it is interesting to be able to use a core number of farms taking part over a long period (mentioned once).

Table 17.5 Sampling method and response rate

Random sampling	Denmark (79%)
	England (6-25%, depending on type of farm)
	Finland
	Italy
	Netherlands (26% on average; 0 to 100%, depending on stratum)
Non-random sampling	Ireland a)
	Sweden a)
	Belgium (Flanders)
	Germany
	Austria
	Hungary
	Switzerland
	France a)
Spain	

a) Data from other sources.

Table 17.6 shows that, among the ten countries concerned, Switzerland has the highest percentage of farms from the field of survey for which data is actually collected (6.1%). The percentage is also high for Denmark and Germany and ranges between 2% and 3.5% for the other countries, while the percentage for Italy could not be established. Italy and Germany have by far the biggest sample sizes in absolute terms.

Table 17.6 *Percentage of farms from the field of survey for which data is actually collected (sample size in brackets)*

Country	Percentage of farms (%)	Country	Percentage of farms (%)
Switzerland	6.1 (3,426)	Austria	2.3 (2,273)
Denmark	5.5 (2,200)	Netherlands	2.2 (1,420)
Germany	4.8 (12,420)	Finland	2.1 (950)
Belgium (Flanders)	3.4 (720)	Hungary	2.1 (1,940)
England	2.7 (1,836)	Italy	unclear (13,911)

The countries were asked whether they systematically replaced the farms in their samples (rotation). For example, one fifth of the farms in the sample could be replaced every year so that each remains in it for five years. None of the countries questioned implements this kind of systematic rotation policy at present. However, England is addressing the issue.

It is usually left to the farm (or office) supplying the data to decide how long the farm remains in the sample. Only the following two countries mention time limits:

- Netherlands: 'usually' not more than 10 years;
- England: not more than 15 years (exceptions: specialist pig, poultry and horticultural farms).

Some countries cited an approximate current rotation figure. As mentioned above, however, rotation is not systematic in any of the countries and may be influenced by all kinds of factors and random events. The cited rotations range between six per cent (Flanders) and 20% (Denmark and the Netherlands). (table 17.7).

Table 17.7 *Rotation in selected countries*

Country	Rotation (%)	Country	Rotation (%)
Denmark	20	Austria	5-10
Netherlands	20	Belgium (Flanders)	6
England	10	other countries	response missing or unclear

17.3.4 Organisation

As can be seen in figure 17.6, half of the evaluating institutions work with other bodies that are organisationally independent from them. In the other half, members of the evaluating institutions collect the data themselves.

Like Switzerland, Denmark and Finland work with accounting offices. However, unlike Switzerland, the farms are selected randomly. It would be interesting to investigate whether all accounting offices in Denmark and Finland are able to provide the evaluating institutions with data or if this would be possible at least from the technical and organisational point of view. In Switzerland this is not currently the case. If random sampling were introduced in Switzerland it could lead to the following problem: farms that are customers of an accounting office not working in collaboration with the evaluating institution would be excluded from the sample. One of the main problems hereby would be the use of different software tools.

	Random sampling	Non-random sampling
Via a body independent from the evaluating institution (e.g. accounting office or tax adviser)	Denmark Finland	Switzerland Germany Hungary
Directly to the evaluating institution	Italy (?) Netherlands England	Belgium (Flanders) Austria

Figure 17.6 Path of data from the farm to the evaluating institution

	Partial source of data for the survey	Not direct source of data for the survey
Tax accounting compulsory	Denmark England Finland (only for income and expenditure, not for depreciation)	Switzerland Netherlands
Tax accounting compulsory for some farms	Italy (only large farms, available information used as data source) Hungary (used as data source?)	Germany (large farms)
Tax accounting not compulsory		Belgium (Flanders) Austria

Figure 17.7 Tax accounting: Obligation to keep tax accounts and use of the data for surveys

Figure 17.7 shows that the keeping of tax accounts is generally compulsory in five of the countries. In Italy, Germany and Hungary it is compulsory only for some farms, and in

Belgium and Austria it is not compulsory at all. Tax accounts are not the sole source of survey data in any of the countries questioned.

17.3.5 Compensation to the farmer

Figure 17.8 shows that only farmers in the three German-speaking countries (Switzerland, Germany, Austria) receive direct financial compensation. In Germany the rate of compensation is €5 per farm per year, while in Austria it is €10. In Switzerland the financial compensation received by the accounting offices serves as an important survey management tool. The average compensation for the accounting offices is €350 (ChF580) per farm per year. The farmer receives direct or indirect compensation from the accounting office, the amount of which varies from one office to another.

Country	Advantage						
	Financial compensation	Evaluation of the farmer's own farm	Evaluation of a group of similar farms	Business management advice	Publications by the evaluating institution	Prognoses for the farm's next accounting year	Free data collection software
Belgium (Flanders)		X	X				
Denmark							
Germany	55€/year	X	partial	partial			
England		X	X	limited			
Finland		X	X	partial	X	X	
Italy		X					
Netherlands		X	X		X		
Austria	110€/year	X	X	partial			X
Switzerland	X	X	X	partial	X		
Hungary		X	X	X			

Figure 17.8 Advantages for farmers taking part in the accountancy network

In all of the countries except for Denmark the farmer receives an evaluation (accounting-based) of his own farm. In most of the countries the farmer also receives an evaluation of a group of similar farms. This is not the case in Denmark and Italy.

Farmers taking part in the survey are sometimes also offered the following benefits, depending on the country concerned:

- business management advice;
- publications of the evaluating institutions: Switzerland, Finland, Netherlands;
- prognoses for the farm's next accounting year: Finland;
- free data collection software: Austria.

In Italy the only advantage for farmers participating in the accountancy network is an evaluation of their own farm. However, participation is in any case compulsory. According

to the information provided by Denmark, Danish farmers derive no direct benefits from taking part.

17.3.6 Data collected

In the area of financial data a balance sheet and a form of profit and loss account is drawn up in all countries. We are unable to draw many conclusions on the level of detail in the individual countries here. The Netherlands appears to go into the greatest level of detail in its national accounting data evaluation system. Here every individual invoice, including all details relating to quality, supplier, purchaser, etcetera, is included in the survey. The national variant covers only some of the farms in the Netherlands. The others are covered in the framework of the Netherlands EU variant, which is less detailed.

As can be seen in figure 17.9, business management criteria are used for the assessment and depreciation of assets in the majority of cases. In Germany, at least the evaluation of assets is based on tax valuations.

Business management criteria	Austria, Denmark, Finland, Hungary, Italy, Netherlands, Switzerland
Tax valuations	Germany (assessment)
No response	Belgium (Flanders), England

Figure 17.9 Criteria for the assessment and depreciation of assets

In some countries the assets are depreciated in a linear manner, while in others the process is either linear or degressive, depending on the balance sheet heading concerned (figure 17.9). None of the countries that completed the questionnaire uses the degressive depreciation alone.

Linear depreciation	Austria, Belgium (Flanders), Italy, Switzerland
Linear or degressive depreciation (depending on item)	Denmark, England, Netherlands (NL mostly degressive)
No response	Germany, Finland, Hungary

Figure 17.10 Depreciation method - linear/degressive

In principle, assets can be depreciated on the basis of cost value or replacement value. Figure 17.11 gives details of the practices followed in the various countries.

Cost value	Germany, Hungary, Italy, Switzerland
Replacement value	Belgium (Flanders), Finland
No response	Austria, Denmark, England, Netherlands

Figure 17.11 Depreciation method - according to cost value/replacement value

According to figure 17.12 four countries collect data on both the income of the farmer's family from non-agricultural activities and the family's private consumption. In three countries neither of the two are surveyed as a general rule. Only one of the two is surveyed in Hungary and England, while in Germany one of the two is surveyed in the case of small income and secondary income businesses. The collection of data on non-agricultural income and private consumption also seems to be possible in countries where farms are selected on a random basis (Denmark, to some extent the Netherlands).

	Private consumption data collected	Private consumption data not collected
Data on non-agricultural income collected	Switzerland (nR) Denmark (R) Netherlands (Income voluntary) (R) Austria (nR)	Germany (small/secondary income farms) (nR) England (R)
Data on non-agricultural income not collected	Hungary (nR) Belgium (Flanders) (nR)	Germany (main income farms) (nR) Finland (R) Italy (R)

Figure 17.12 Collection of data on non-agricultural income and private consumption
R) Country using random sampling; nR: Country not using random sampling.

The extent to which physical or technical data is collected varies considerably. The following information is collected in all countries:

- number of labour units and/or working hours/days;
- size of agricultural land;
- number of livestock.

All the countries rate the overall quality of data collected as at least generally satisfactory.

17.3.7 Publications

The type and extent of publications varies. It is interesting to note that, with the exception of Switzerland, all the countries that answered the question on Internet publication indicated that they publish databases or at least tables of their results on the Web (figure 17.13).

Yes	Denmark, England, Finland, Germany, Hungary, Italy, Netherlands
No	Switzerland
No response	Austria, Belgium (Flanders)

Figure 17.13 Publication of tables or databases on the Web

17.3.8 Planned changes

The countries were asked to indicate whether they were planning or considering major changes to their methodologies.

The following items were cited in several cases:

- new selection plan;
- move from Standard Gross Margins to Standard Output.

England mentions the following points:

- general review of statistical methods (in progress);
- estimation using calibration techniques (completed);
- robust estimation of sampling errors (started);
- assessment of impact of non-response (in progress).

In the Netherlands changes are continually being implemented. Two items were mentioned in particular:

- get electronic invoices directly from large suppliers or processors on standardised format and on a very detailed level (called EDI circle);
- coupling with databases of nature quality for farmers involved in nature management.

17.4 Conclusions

The results of the questionnaire have provided an initial overview of the differences and similarities between the methodologies used by the different countries. For more detailed questions, the countries concerned can now be asked for information in a more targeted manner if required.

Four of the countries questioned work with accounting offices in a similar way to Switzerland and are therefore of primary interest to Switzerland when it comes to comparing methodologies (figure 17.14).

Random sampling	Non-random sampling
Denmark	Switzerland
Finland	Germany
	Hungary

Figure 17.14 Countries working with accounting offices

Germany appears to be closest to Switzerland as, like Switzerland, it does not have a random sampling approach and its farmers receive financial compensation.

Denmark and Finland are examples of countries that use random sampling and work with accounting offices. In both countries tax accounting is compulsory, as in Switzerland, and the associated data is used as one of the sources of information for survey purposes. In

Denmark data is collected on non-agricultural income and private consumption, as in Switzerland. This is not the case in Finland.

17.5 Acknowledgements

The responses from the persons listed in figure 17.15 made this report possible. Daniel Kilchmann from the Federal Statistics Office also provided valuable input. The author would like to thank all those involved for their cooperation.

References

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Cochran, W.G., *Stichprobenverfahren*. De Gruyter, Berlin/New York, 1972.

Krug, W., M. Nourney and J. Schmidt, *Wirtschafts- und Sozialstatistik - Gewinnung von Daten*. Oldenburg-Verlag, München/Wien, 6. Auflage, 2001.

The people listed in figure 17.15 kindly agreed to complete the questionnaire and make their replies available to us.

Land	Name	Institution	Postal address	E-Mail
Austria (I/II)	Josef Binder	Bundesanstalt für Agrarwirtschaft	Marxergasse 2, A-1030 Wien	josef.binder@awi.bmlfuw.gv.at
Austria (II/II)	Martin Hellmayr	LBG Wirtschaftstreuhand	Boerhaavegasse 6, A-1030 Wien	m.hellmayr@lbg.at
Belgium (Flanders)	An Van den Bossche	Flemish government, Department of Agriculture and Fisheries, Division for Agricultural Policy Analysis	Ellips, 6de verdieping, Koning Albert II-laan 35 bus 40, 1030 Brussels	An.vandenbossche@lv.vlaanderen.be
Croatia	Zaklina Jurisic	Ministry of Agriculture, Forestry and Water Management	UL. Grada Vukovara 78, 10000 Zagreb	zjurisic@mps.hr
Denmark	Steffen Møllenberg	Institute of Food and Resource Economics	Rolighedsvej 25, 1958 Frederiksberg C	steffen@foi.dk
England	Selina Matthews	Department for Environment, Food & Rural Affairs (DEFRA)	9 Millbank, c/o 17 Smith Square, London SW1P 3JR	Selina.matthews@defra.gsi.gov.uk
Finland	Arto Latukka	MTT Economic Research	Luutnantintie 13, 00410 Helsinki	arto.latukka@mtt.fi
Germany	Josef Hauser	Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz, BMELV, Referat 426: Ertragslage und Betriebserhebungen)	Rochusstrasse 1 53123 Bonn	Josef.Hauser@BMELV.bund.de
Hungary	Szilard Keszthelyi	Agricultural Economics Research Institute (AKI)	1093 Budapest, Zsil u. 3-5, Hungary	keszthelyisz@akii.hu
Italy	Linda Di Mico	Inea (Istituto Nazionale di Economia Agraria) Via Barberini, 36_00187 Rome_Italy	Via Barberini 36, 00187 Rome	dimico@inea.it
Netherlands	Koen Boone	Centre of Economic Information, LEI	Burg Patijnlaan 19, 2585 BE Den Haag	Koen.boone@wur.nl

Figure 17.15 Responding persons/bodies

18. Different definitions of other gainful activities in agricultural statistics and its implications for the use of statistics

Ann-Marie Karlsson, Swedish Board of Agriculture



Swedish Board of Agriculture

**Other gainful activities
in agricultural statistics**

–

**what a researcher need
to know?**

The case of Sweden

**JORDBRUKS
VERKET**

2007-11-16

Other gainful activities in agricultural statistics

- EU-FADN**
- Swedish FADN (forestry included)**
- Farm Structure Survey (FSS) 2007**
- Farm Structure Survey (FSS) 2010**
- Economic Accounts for Agriculture (EAA)**
- Swedish Income of Agricultural households (IAHS)**
- AD-hoc studies**

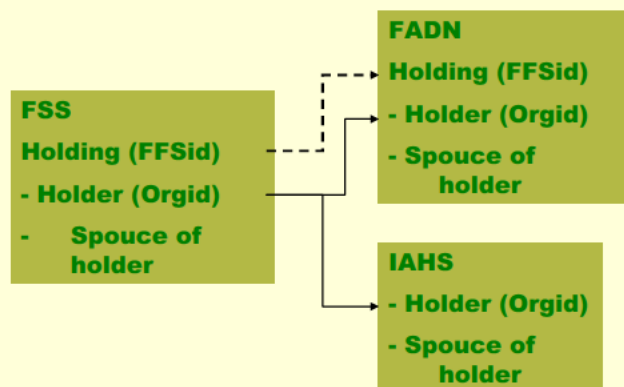
Other gainful activities in agricultural statistics

- FADN >90% of SGM**
 - Sample of 1 025 holdings, representing 30 500 holdings
- FSS >99 % of SGM**
 - Census of 75 800, sample of 30 000 holdings
- EAA >99 % of SGM+++**
 - Sources representing 75 800 holdings+++
- IAHS FSS-population, physical persons**
 - 64 900 households

Other gainful activities in agricultural statistics

- ❑ **FADN (micro-level)**
 - ❑ book-keeping, questionnaires, interviews, registers
- ❑ **FSS (micro-level)**
 - ❑ (questionnaire, registers)
- ❑ **EAA (macro-level)**
 - ❑ all kind of sources
- ❑ **IAHS (micro-level)**
 - ❑ merge of FSS and Income Register

Merging objects in different surveys



What is measured?

- Existence** (FSS, FADN)
- Output** (FADN, EAA,)
- Costs** (FADN, EAA)
- Labour divided in categories** (FSS, FADN)
- Types of income** (IAHS)

Key-aspects on other gainful activities

Activities are...

- agricultural or not** (FADN, EAA, FSS)
- separable or non-separable from agriculture** (EAA)
- using agricultural resources/ products or not** (FADN, FSS)
- generating an income from self-employment or not** (IAHS)

Key-aspects on other gainful activities

Agricultural activities on the holding	Other gainful activities		
Self-employment			Employment
Agricultural resources	Agricultural resources	Non-agricultural resources	.....
Agricultural	Non-separable	Separable	.....

FADN

Agricultural activities on the holding	Other gainful activities		
Self-employment			Employment
Agricultural resources	Agricultural resources	Non-agricultural resources	.....
Agricultural	Non-separable	Separable	.....

EAA

Agricultural activities on the holding	Other gainful activities		
Self-employment			Employment
Agricultural resources	Agricultural resources	Non-agricultural resources	.....
Agricultural	Non-separable	Separable	.....

FSS

Agricultural activities on the holding	Other gainful activities		
Self-employment			Employment
Agricultural resources	Agricultural resources	Non-agricultural resources	.....
Agricultural	Non-separable	Separable	.....

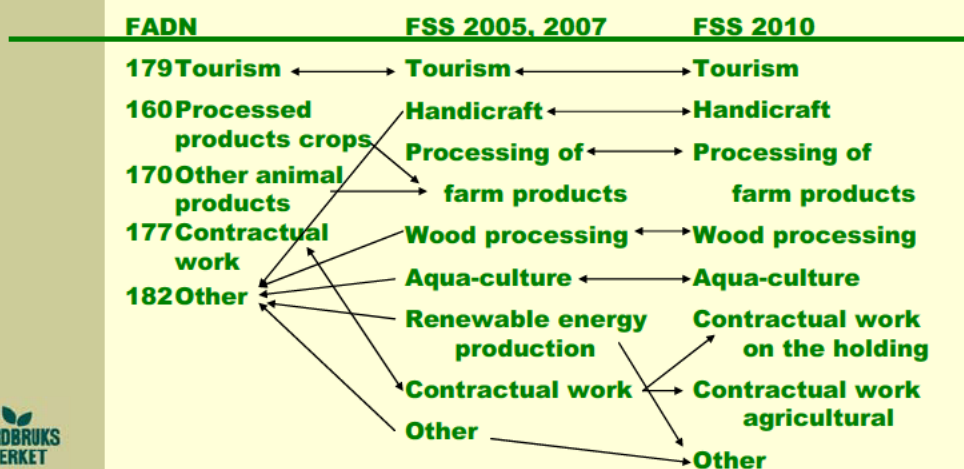
IAHS

Agricultural activities on the holding		Other gainful activities	
Self-employment			Employment
Agricultural resources	Agricultural resources	Non-agricultural resources	.....
Agricultural	Non-separable	Separable	.....

Existence FADN, FSS

Agricultural Activities		Other gainful activities	
Self-employment			employment
Agricultural resources	Agricultural resources	Non-agricultural resources	.....
Agricultural	Non-separable	Separable	.....

Existence?



Existence

- FSS 2005 9 952 holdings
- FADN 2005 10 500 holdings

Output and costs FADN, EAA

Agricultural Activities	Other gainful activities		
Self-employment			employment
Agricultural resources	Agricultural resources	Non-agricultural resources	.....
Agricultural	Non-separable	Separable	.....

Output

FADN	EAA
179 Tourism	Non-separable activities
160 Processed products crops	2 400 million SEK
170 Other animal products	
177 Contractual work	
182 Other	

Costs

FADN

EAA

**Included in variables
for costs**

**Included in variables
for costs**



2007-11-16

Labour FADN, FSS

F A D N	FSS	Agricultural Activities	Other gainful activities	
		Agricultural Activities	Other gainful activities	
		Self-employment		employment
			Agricultural resources	Non-agricultural resources
		Agricultural	Non-Separable	separable
			
			



2007-11-16

Labour FSS 2005

Other gainful activity as major occupation

- 35 322 Holder
- 23 034 Spouse
- 12 503 Other family members

Other gainful activity as subsidiary occupation

- 10 727 Holder
- 2 779 Spouse
- 1 774 Other family members

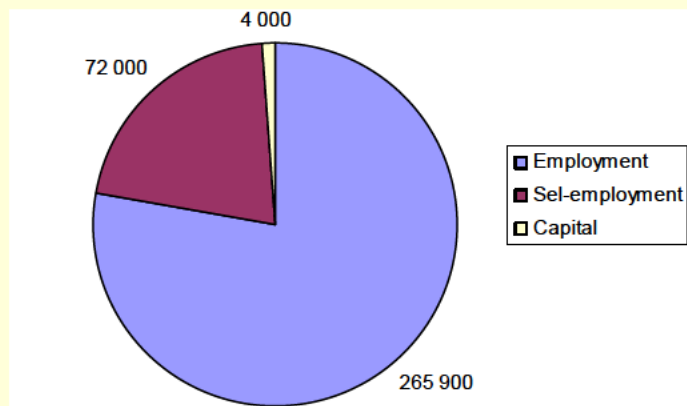
Other gainful activity is no occupation

- 24 662 holder
- 10 191 Spouse
- 9 701 Other family members

Incomes from employment self-employment

Agricultural activities on the holding	Other gainful activities		
Self-employment			Employment
Agricultural resources	Agricultural resources	Non-agricultural resources	.....
Agricultural	Non-separable	Separable	.....

Household incomes



Ad-hoc study regarding 2005 made in fall 2006

- Questionnaire 9 000 holdings**
 - Existence of other gainful activities
 - Total output
 - Labour
- IAHS estimations on individual household members**
- Comparisons of registers to improve quality**

Ad-hoc study regarding 2005- results

	Agr. activities on holding		Forestry
	Agricultural resources	Other gainful activities	
Holdings	75 800	16 300	51 800
Total Output	43 200 million SEK	5 600 million SEK	5 000 million SEK
Total AWU	72 200	11 300	13 400

Existence for the year 2005

FSS 2005

Contractual work 4 652 holdings

Total number of holdings 9 952 holdings

FADN 2005 Total number of holdings 10 500 holdings

Questionnaire regarding 2005

Contractual work 5 070 holdings

cleaning snow

Contractual work 6 321 holdings

agricultural

Contractual work other 4 100 holdings

10 200 holdings

Total number of holdings

16 300 holdings

Advice for a researcher?

Be aware of:

- different populations and definitions
- Different Collection methods and sampling-strategies

Take advantage of

- Linking-possibilities between surveys on microlevel
- The possibilities to compare results from different surveys

Thank you...



.... for your attention

Questions?

Workgroup session 3: Other gainful activities

Theme

Other Gainful Activities (OGA) like tourism and small shops at the farm, are getting more and more important. Not only is the percentage of output from OGA increasing but they have also increased interest from policy makers. As Mrs. Helaine showed the OGA get an important role in the new typology.

It is however not clear how to include OGA in FADN. The EU-FADN does not have clear instructions and Karlsson et al. concluded in the study for the EU-FADN that large differences exist between countries.

There are two important questions. First it should be defined what an OGA is. The EU-FADN makes a distinction between:

- agricultural activities;
- other Gainful Activities;
- other business activities that happen on the farm but have no relation with agriculture.

One criteria for including an activity as an OGA is that agricultural assets are used. Other criteria are still not clear.

Group A and B started with making a list of activities that are treated in the countries of the members of the group as an OGA. Based on this list, the members tried to find common criteria why an activity is included as an OGA. They were asked to make a split between generally agreed criteria and criteria that are used in one or more countries.

The second question is how to include farms with non agricultural activities in FADN. The EU-FADN and most national FADN are developed for a farm that only produces agricultural products. Therefore some national FADN exclude farms that have a minimum percentage of non agricultural activities (OGA's and/or other business activities without relation with agriculture). Others include those farms but exclude output and costs of the non agricultural activities as far as possible. Some FADNs try to include OGA but exclude other business activities with no relation with agriculture. Most of these FADNs exclude 'farms' with a very large percentage of output from non agricultural activities (A large hotel with restaurant that serves the milk and meat of their 3 cows).

Group C en D started with listing advantages and disadvantages of the different models for including OGA and business activities in FADN. If useful they made a split between FADN managers and users of the FADN data. Based on this, they were asked to make an EU-FADN instruction on how to deal with OGA's and other business activities in FADN.

Group composition

Group A

Chair: Ted Covey
 Reporter: Marcin Cholewa
 Members: Hans Vrolijk
 Ann-Marie Karlsson
 Catherine Moreddu

Group B

Chair: Anita Stannova
 Reporter: Ester Van Broekhoven
 Members: Eudard Matveev
 Lovisa Reinsson

Group C

Chair: Kaspar Muehlethaler
 Reporter: Koen Boone
 Members: Sophie Helaine
 Maija Puurunen

Group D

Chair: Olli Rantala
 Reporter: Beat Meier
 Members: Dineke van Zwieten
 Arto Latukka
 Torbjørn Haukås

Group A and B

Other Gainful Activities (OGA)

An OGA is an activity for which:

- agricultural assets are used;
- the costs cannot be split from the costs of the agricultural activities at the farm;
- a minimum number of working hours is used;
- a minimum amount of capital is used;
- an activity which generates a minimum amount of net income.

Activity	M	N	S	E	B
Processing own products into products that can be sold directly to consumers (marmalade, wine, cheese, beef,...)	x	x	x	x	x
Selling own products in shop on the farm	x	x	x	x	x
Green care		x			x
Contract work with agricultural equipment for public (snow cleaning), harvesting other land		x	x	x	
Fisheries	x				
Tourism (guided tours, B&B, renting houses (yearly basis), fishing)		x	x	x	x
Rent land (meadows for horses)		x	x		x
School class (kindergarten visits)		x			x
Other business activities (not related to agriculture):					
Selling products that are not processed on the farm	x	x	x	x	x
Forestry	x	x	x	x	
Mobile phone transmitter	x	x	x	x	x

M = Macedonia

N = Norway

S = Sweden

E = Estonia

B = Belgium

List of OGA:

- agritourism;
- processing of farm products;
- renewable energy production;
- contractual work (with equipment of the farm);
- forestry;
- fishing and hunting rights;
- recreation activities (cultural, museum);
- oil, gas;
- handicraft;
- direct sales.

Criteria:

- agricultural resources;
- farm labour;
- capital;
- ...

Group C and D

Include cell:

- total income of all and contribution of OGA in total (policy relevant);
- what to do, split costs or not (start with no split). No possibility separating activity;
- no discussion on definition of OGA and OGA and business activities;
- farm return is not suited for it;
- more complex to compare agricultural activities;
- how to motivate farms to cooperate?

Unit for including farms/activities combination:

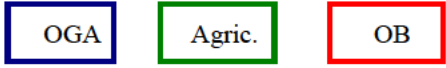
- minimum number of agricultural activities.

Then include all OGA:

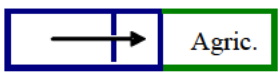
- minimum % of agricultural activities;
- minimum % of agricultural of OGA;
- miss rent of agricultural activities (disadvantage);
- minimum threshold for including or not including thresholds;
- other gainful activities: car costs be separated.

Not including:

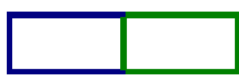
- split of costs / output on to these activities (also labour):
 - could comparison of agricultural activities;
 - expensure to split costs;
 - do not know total income and no information about OGA.



FADN



X ← Field of survey ?



FADN



Airport
Hotel
Forestry

Appendix 1 List of participants

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

