Proceedings of 24th Pacioli Workshop: FADN in a changing environment

Pristina, Kosovo, 25 September - 28 September 2016

Hans C.J. Vrolijk (ed.)

WAGENINGEN
UNIVERSITY & RESEARCH

Proceedings of 24th Pacioli Workshop: FADN in a changing environment

Pristina, Kosovo, 25 September - 28 September 2016

dr. Hans C.J. Vrolijk (ed.)

Wageningen Economic Research
Wageningen, January 2017

REPORT
2017-009
ISBN 978-94-6343-093-7

WAGENINGEN
UNIVERSITY & RESEARCH

Vrolijk, H. (ed.) *Proceedings 24th Pacioli Workshop: FADN in a changing environment Pristina, Kosovo, 25th of September - 28th of September 2016.* Wageningen, Wageningen Economic Research, Report 2017-009. 138 pp.

The international Pacioli network shares best-practices and innovations on the collection, management and use of micro-economic databases in agriculture (such as the Farm Accountancy Data Network in Europe). Each year, Wageningen Economic Research organises the Pacioli Workshop in close cooperation with a local organiser. The 24th Pacioli workshop took place in Pristina, Kosovo in September 2016.

Key words: Pacioli, FADN, farm-level data, policy analysis

This report can be downloaded for free at http://dx.doi.org/10.18174/405713 or at www.wur.nl/economic-research (under Wageningen Economic Research publications).

P.O. Box 29703, 2502 LS The Hague, The Netherlands, T +31 (0)70 335 83 30,
E communications.ssg@wur.nl, www.wur.nl/economic-research. Wageningen Economic Research is part of Wageningen University & Research.

Wageningen Economic Research Report 2017-009

Project code: 2282200235

Cover photo: Hans Vrolijk

Contents

Preface

For the 24th time, Wageningen Economic Research organised the yearly Pacioli workshop. This year it took place in Pristina, Kosovo, from 25 September to 28 September 2016.

The Pacioli workshop brought together 30 experts on collecting, managing and using farm-level data for policy analysis and research. The participants discussed innovations and developments in the collection and use of farm-level data. Important topics were the developments in data collection, IT developments for data exchange and dissemination of information and a range of innovative ideas and applications in using data for policy analysis and research.

The Ministry of Agriculture in Kosovo hosted the meeting and took care of the local organisation. Wageningen Economic Research was responsible for organising the content of the programme and chairing the meeting. We thank Edona Mekuli, Adelina Maksuti and Hakile Xhaferi for their kind offer to host the workshop and their work in preparing the workshop.

Prof. J.A.G.J. van der Vorst
General director Social Sciences Group
Wageningen University & Research

1 Introduction

1.1 Objectives of 24th Pacioli Workshop

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 who 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, learning and innovation is fostered.

It is with this background that the PACIOLI network organises a workshop every year. This year the 24th edition already 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. See www.pacioli.org for the presentations and papers of all the workshops.

Topic of the workshop: FADN in a changing environment

The European Farm Accountancy Data Network (FADN) collects detailed financial economic information on a sample of farms in Europe. These data are intensively used for the evaluation of the Common Agricultural Policy. Countries outside the EU have similar data collection systems at farm level to monitor the developments in the agricultural sector and to evaluate agricultural policies.

The environment in which FADN is operating is however changing. The information needs have changed due to changes in the Common Agricultural Policy; developments in IT solutions have created new opportunities to collect, store and manage data; and the developments around big data and the increasing information flows in the sector have created new ways of collecting data.

Owing to changes in the agricultural policies and the increasing societal demands with respect to the sustainability of agricultural production, the information needs change. There is a stronger need for data on the sustainability performance of farms in addition to the economic performance of farms.

The information technologies for data exchange support the re-use of data. EDI standards have been developed that facilitate the exchange of information between companies. SDMX is a standard for the exchange of statistical data. Standard Business Reporting defines XBRL standards to exchange information between banks, businesses and the government. These initiatives facilitate the efficient exchange of information and thus allow the re-use of information.

In the 24th edition of the Pacioli Workshop these topics have been discussed. The impact of new data needs and the possibilities to collect these data have been presented and discussed in a working group session. Data collection issues such as the use of administrative data, the use of big data and the feasibility of collecting sustainability data have been presented. The impact of IT developments on the possibilities to disseminate and manage data have been presented and discussed. Like in other Pacioli workshops, a range of new innovative ideas and applications of using FADN data in policy analysis and research have been discussed. See the next section for the full programme.

1.2 Programme of the 24th Pacioli Workshop

Sunday, 25th of September 2016

20.30 Get together for informal drink

Monday, 26th of September 2016

09.00 OPENING
Opening of workshop by Ministry of Agriculture, Pristina by Ekrem Gjokaj
Introduction Workshop by Hans Vrolijk
Introduction participants

10.00 Paper Session I: Agriculture in Kosovo
Ekrem Gjokaj - Overview of agriculture in Kosovo
Edona Mekuli and Adelina Maksuti - Development of FADN in Kosovo

10.45 BREAK

11.15 Paper Session II: Use of FADN data
Eduard Matveev - Impacts of agro-environmental policy on the nutrient use efficiency of Estonian farms
Thomas Resl - Analysing yields of organic and non-organic Farms in Austria
Jostein Vasseljen - Milking robots in Norwegian Dairy industry

12.30 LUNCH

13.30 Paper Session III: Data collection issues
Martin Beaulieu - Reducing response burden by new data collection methods
Ann-Marie Karlsson - Use of administrative data from the view of the European code of practise regarding statistics
Piotr Czarnota - Polish experiences in collecting FLINT data from FADN farms

14.30 Workgroup session 1

14.30 Group discussion

15.30 BREAK

15.45 Plenary feedback of group discussions

16.15 Paper Session IV: Methods for farm results
Zuzana Hlousková - Multi-criteria evaluation of farms based on Czech FADN
Lucian Emanuel Stanca - A review and improvement of the income determination and forecast system for the Bavarian Agricultural Report
Harold van der Meulen - Dutch FADN: income estimations with FES model
Henrik Bolding Pedersen - Experience with publication of early farm results in Denmark

18.15 WRAP UP

20.00 DINNER

Tuesday, 27th of September 2016

9.00 Paper Session V: Methodological aspects
Daniel Hoop - Change in agricultural income estimate due to the introduction of the Swiss random sample
Szilárd Keszthelyi - Problems of using Standard Output for farm benchmarking among EU Member States
Neil White - Design issues in Scottish FADN

10.15 BREAK
10.45 Workgroup session 2
10.45 Group discussion
11.45 Plenary feedback of group discussions

12.15 LUNCH
13.15 Agri-cultural Excursion with dinner

Wednesday, 28th September 2016

9.00 Paper Session VI: Data exchange and delivery
Mika Sulkava - Greenhouse gas emissions in Economy Doctor
Ben Lang - User Friendly FBS data delivery
Eugene Westerhof and Derek Verwey- FADN IT infrastructure.

10.15 BREAK
10.45 Paper session VII: Economic Analysis
Hans Vrolijk - Implications of a Brexit for British Agriculture
Maja Kožar - Quality analysis of the FADN results for Slovenia
Christopher Burns - US farm household income volatility

12.00 Closing
12.30 Lunch
13.15 DEPARTURE

2 Paper session 1: Agriculture in Kosovo

2.1 Overview of agriculture in Kosovo

Ekrem Gjokaj

- Kosovo is located in the center of the Balkan Peninsula
- The total surface of Kosovo is 10.908 km² with a continental and some Mediterranean Climate influence in the lower areas
- The population of Kosovo is around 1.8 million, 63% lives in rural area and 37% in urban area
- Kosovo has the youngest population in Europe with 53% of the population being under 25 years old.
- GDP per capita 3,093 €
- Agriculture contributes with 12 % in Kosovo's GDP

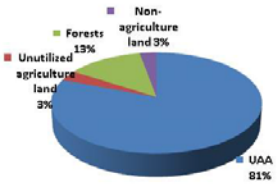
Ministry of Agriculture, Forestry and Rural Development

- The Agriculture Census was conducted in 2014 in the Republic of Kosovo after more than 50 years
- Number of agricultural holdings - 130,775
- Average area cultivated by agricultural holding is 3.2 ha
- The average Livestock Unit per livestock holding is 3 LSU
- No. of persons working in agriculture is 362,700 with contribution in farm work 86,620 AWU
- Average value of AWU - 0.7 AWU/agricultural holding

Ministry of Agriculture, Forestry and Rural Development

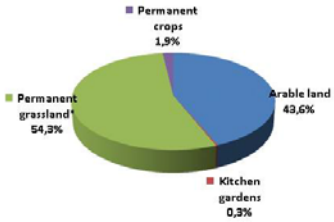
Total land area owned by AH 512,000 ha (47% of total land)

Land structure of economic holdings



Utilized agriculture area 413,635 ha (38% of total land)

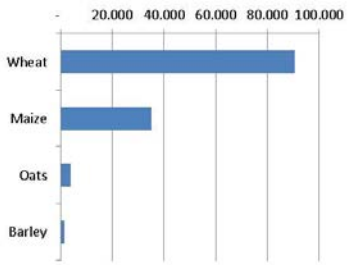
UAA structure



*Pastures and meadows including common land

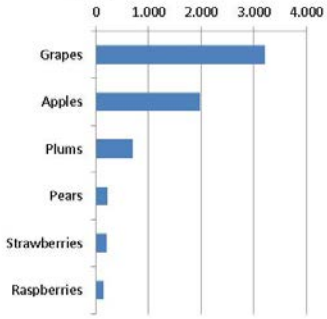
Ministry of Agriculture, Forestry and Rural Development

Cereals (ha)



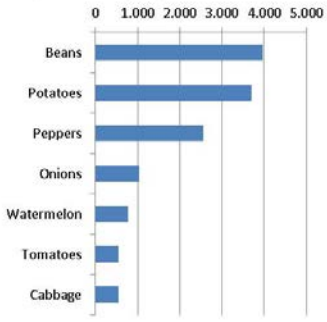
Ministry of Agriculture, Forestry and Rural Development

Fruits (ha)



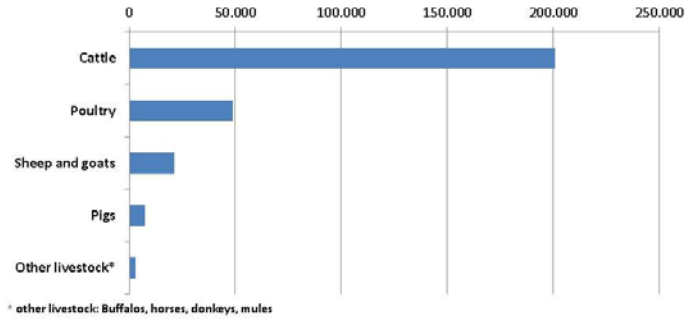
Ministry of Agriculture, Forestry and Rural Development

Vegetables (ha)



Ministry of Agriculture, Forestry and Rural Development

Livestock Units



Ministry of Agriculture, Forestry and Rural Development

- Organic farming key indicators 2015:

- Organic agricultural area – 160 ha
- Share in UAA – 0.04%
- Organic producers – 100 farms
- Organic processors – 5 companies
- Since 2016 organic farming supported through direct payments (area cultivated) and RD measures where farmers earn additional point during evaluation

Ministry of Agriculture, Forestry and Rural Development

Ministry of Agriculture, Forestry and Rural Development

Objectives of the Agriculture and Rural Development Program:

- Additional income for farmers and rural residents by improving conditions and living standards in rural areas;

- Improving the processing and marketing of agricultural products;

- Sustainable rural development and improvement of the quality of life through promotion of agriculture;

- Alignment of Kosovo agriculture with the EU standards;

Ministry of Agriculture, Forestry and Rural Development

ARDP is oriented in two types of support for agriculture producers: DP and RDM

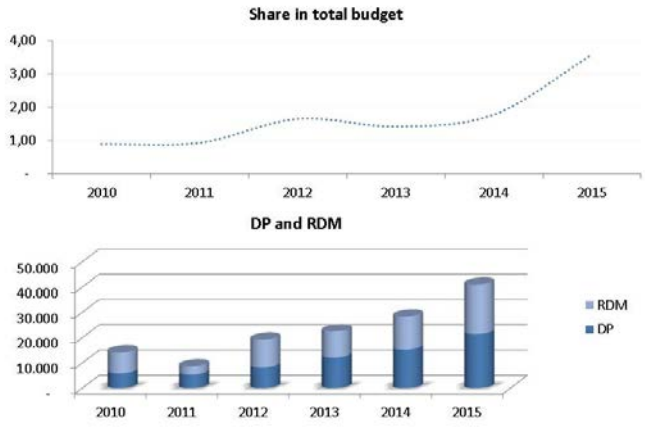
In 2015 the implemented DP and RDM were:

Direct payments - Wheat, Wheat seed, Maize, Sunflower, Existing orchards, Vineyards, vegetables on open field, Dairy cows, sheep and goats, Beehives, Chicken, pigs, milk, seedlings, slaughtered animals

Rural Development measures

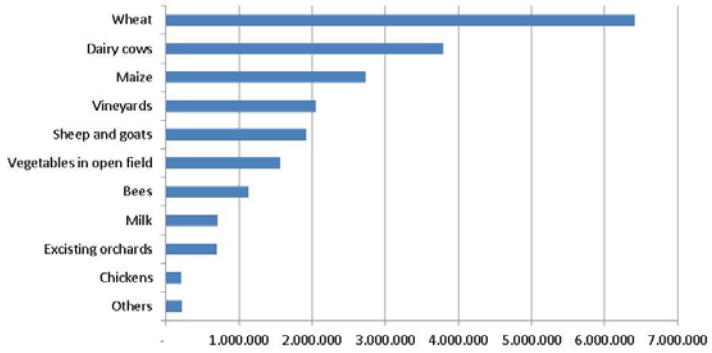
Measure 101– Investments in physical assets in agricultural economies;
Measure 103 – Investments in physical assets for processing and marketing of agricultural products;
Measure 302 – Diversification of farms and business development;
Measure 303 – Preparation and implementation of Local Development Strategies - LEADER
Measure on irrigation of agricultural lands (IAL)

Ministry of Agriculture, Forestry and Rural Development



Ministry of Agriculture, Forestry and Rural Development

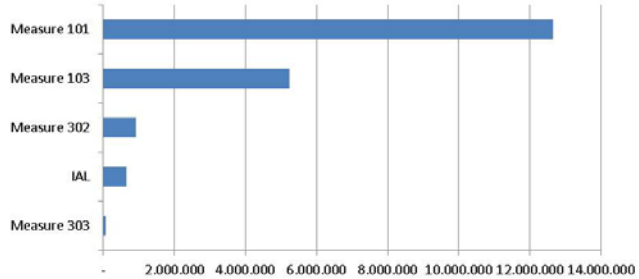
Direct payments 2015



*others- sunflower, wheat seed, seedlings, sows and slaughtered animals

Ministry of Agriculture, Forestry and Rural Development

Rural Development Measures 2014



*101-Investments in physical assets in agricultural economies
103-Investments in physical assets in the processing and marketing of agricultural products
302-Diversification of farms and business development
303-Preparation and implementation of Local Development Strategies - LEADER
IAL-Measure on irrigation of agricultural lands

Ministry of Agriculture, Forestry and Rural Development

Thank you for your attention!

ekrem.gjokaj@rks-gov.net

2.2 Development of FADN in Kosovo

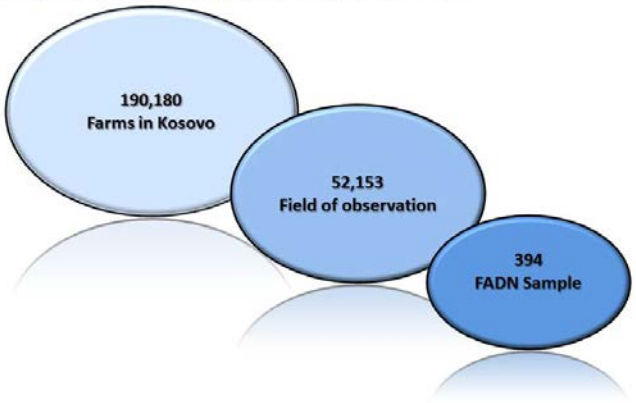
Edona Mekuli and Adelina Maksuti

Ministry of Agriculture, Forestry and Rural Development

- There is limited number of specialized and commercial farms in Kosovo.
- Agricultural holdings are very small and mostly semi-subsistent.
- Holdings usually rely on a range of enterprises
- Economic Size threshold – 2,000 €
- Standard Output per farm – 9,175 €
- 70% of farms with economic size less than 2,000 €
- 40% of farms are mixed crop and livestock

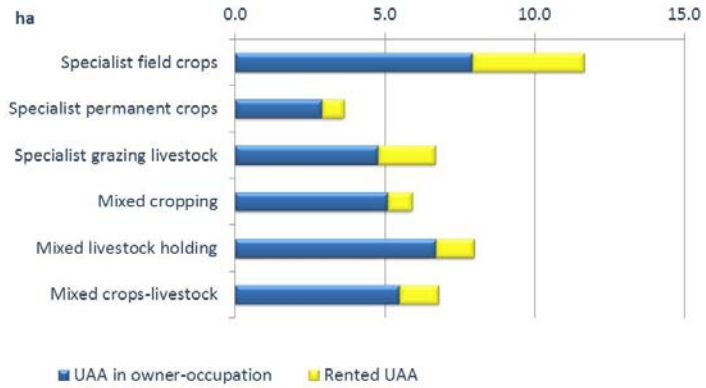
Ministry of Agriculture, Forestry and Rural Development

Until FADN 2014, data used from the Agricultural Household Survey
Latest CENSUS data for 2014 published in November 2015



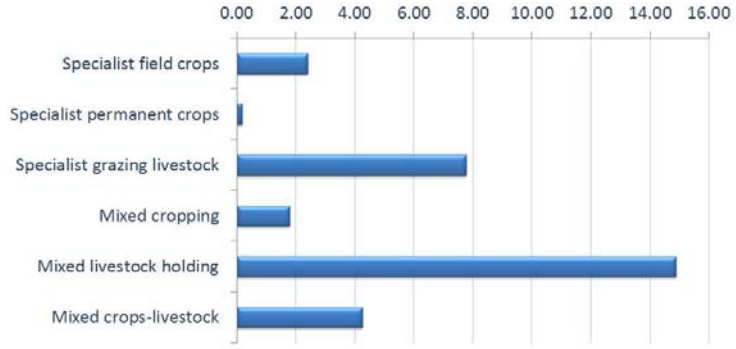
Ministry of Agriculture, Forestry and Rural Development

Land use by type of farming, FADN 2014



Ministry of Agriculture, Forestry and Rural Development

LSU by type of farming, FADN 2014

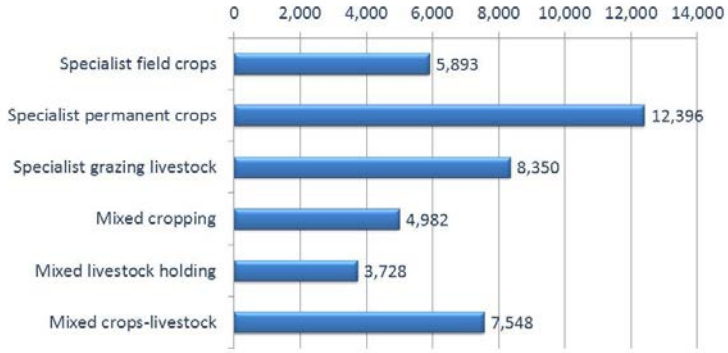


Ministry of Agriculture, Forestry and Rural Development

Labour input by type of farming, 2014

Ministry of Agriculture, Forestry and Rural Development

Farm income, FADN 2014



Ministry of Agriculture, Forestry and Rural Development

FNVA per AWU by type of farming, 2014

Ministry of Agriculture, Forestry and Rural Development

FADN 2016

- New sample designed based on results from Agriculture Census 2014
- number of agriculture holdings 130,775
- average UAA 3.2 ha
- 63% of farms have less than 2 ha
- average livestock unit per agriculture holding is 2.1 LSU
- 75% of farms have less than 1 LSU

Ministry of Agriculture, Forestry and Rural Development

...

- Agriculture holdings have been classified based on type of farming and economic size
- The determination of these elements is based on the standard output coefficients and on structural data of holding.
- Data used to calculate SO
  - Yield (average yield in a country)
  - Quantities produced
  - Prices
  - Cultivated area
  - Number of animals present and slaughtered
  - Technical information as length of production cycle,
  - productivity of animal mortality of new born, etc.

Ministry of Agriculture, Forestry and Rural Development

Farms based on Agriculture Census 2014

Economic size classes	Number of holdings	% in total number of holdings	So, million €	% of total SO	UAA, thousand ha	% of total UAA	LSU, thousand	% of total number of LSU
1	59,659	45.62	59	8.40	55	13.38	30	10.70
2	30,545	23.36	87	12.41	64	15.57	47	16.52
3	21,164	16.18	119	16.86	79	19.09	57	20.38
4	15,225	11.64	202	28.71	122	29.42	83	29.40
5	2,914	2.23	98	13.93	52	12.67	32	11.51
6	930	0.71	62	8.81	24	5.83	15	5.25
7	322	0.25	54	7.67	15	3.70	13	4.62
8	16	0.01	23	3.22	1	0.34	5	1.63
Total	130,775	100	703	100	413	100	282	100

Ministry of Agriculture, Forestry and Rural Development

Representativity of FADN sample 2016

- Farms in the field of observation covers:
  - 54% of total number of agriculture holdings
  - 91.6% of total standard output
  - 86.6% of total UAA
  - 89.3% of total LSU

Ministry of Agriculture, Forestry and Rural Development

Field of observation 2014

		Economic size class							Total
		2,000-4,000	4,000-8,000	8,000-25,000	25,000-50,000	50,000-100,000	100,000-500,000	> 500,000	
1	Specialist field crops	6,914	3,835	3,095	983	404	117	3	15,351
2	Specialist horticulture	76	105	194	117	93	51	1	637
3	Specialist permanent crops	877	945	1,028	193	63	20	4	3,130
4	Specialist grazing livestock	4,937	2,631	2,145	447	95	14	1	10,270
5	Specialist granivores	1,026	779	314	43	43	69	7	2,281
6	Mixed cropping	1,551	1,491	1,233	194	48	15		4,532
7	Mixed livestock holding	3,769	2,522	1,225	120	18	4		7,658
8	Mixed crops-livestock	11,395	8,856	5,991	817	166	32		27,257
	Total	30,545	21,164	15,225	2,914	930	322	16	71,116

Ministry of Agriculture, Forestry and Rural Development

Selection plan 2016

		Economic size class							Total	%
		I	II	III	IV	V	VI	VII		
1	Specialist field crops	122	67	54	17	7	2	0	270	22
2	Specialist horticulture	1	2	3	2	2	1	0	11	1
3	Specialist permanent crops	15	17	18	3	1	0	0	55	4
4	Specialist grazing livestock	87	46	38	8	2	0	0	181	14
5	Specialist granivores	18	14	6	1	1	1	0	40	3
6	Mixed cropping	27	26	22	3	1	0	-	80	6
7	Mixed livestock holding	66	44	22	2	0	0	-	135	11
8	Mixed crops-livestock	200	156	105	14	3	1	-	479	38
	Total	537	372	268	51	16	6	0	1250	100
	%	43	30	21	4	1	0	0	100	

Ministry of Agriculture, Forestry and Rural Development

Future developments

- Drafting the law for FADN
- Creating a new software for FADN
- Switching from face to face to electronic survey
- Create an FADN unit within the MAFRD

Ministry of Agriculture, Forestry and Rural Development

THANK YOU!

Ministry of Agriculture, Forestry, and Rural Development

Adelina.Maksuti@rks-gov.net

Edona.Mekuli@rks-gov.net

3 Paper session II: Use of FADN data

3.1 Impacts of agro-environmental policy on the nutrient use efficiency of Estonian farms

Eduard Matveev

INTRODUCTION

- ✓ The objective of the study is to assess the impact of the Rural Development Plan agri-environmental measures on the nutrient use efficiency of Estonian farms based on the FADN data for year 2015.
- ✓ At the moment, there is no legal obligation for farmers to calculate nutrient balances in Estonia.
- ✓ Registration of input of fertilizers (both manure and mineral fertilizers) is mandatory on field level in the field record book.
- ✓ Holdings over 300 livestock unit with liquid manure are obliged to prepare three year fertilization plans.

2

IMPORTANCE OF NUTRIENT BALANCE

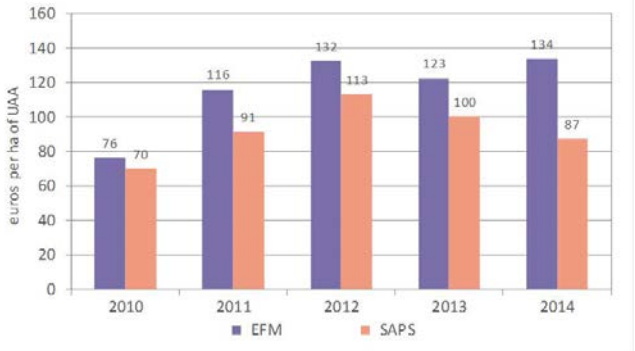
As the economic conditions improve, the negative impact on the environment increases. For example, the use of plant protection products and mineral fertilizers is growing, and this may bring about water pollution and decrease in biological diversity, unless modern environmentally friendly technologies are used.

The decrease of soil organic matter and nutrients, caused by the lack of classical crop rotation, nutrient balance data and fertilization plans

Much attention should be given to the maintenance of the soil organic matter content, in order to avoid the exhaustion of soil. With underfertilization (impoverishment of soils) more organic matter will be taken out from field while growing of crops than being applied to.

3

MINERAL FERTILISERS CONSUMPTION IN HOLDINGS OF FIELD CROPS TYPE OF FARMING



EFM – Environmentally friendly management farms
SAPS – Single area payment scheme farms
Source: Own calculation based on FADN data

4

LEGAL BACKROUND

The main legal act in Estonia which implements the Nitrates Directive is Water Act, which sets down rules concerning the use of fertilizers and requirement for nutrient bookkeeping in the field record book.

The Estonian Rural Development Plan (RDP) provides that soil and manure sampling at least once within the 5-year commitment period is compulsory for all producers.

Being aware of analyse results, it is possible to reduce underfertilization (impoverishment of soils) and overfertilization and environmental pollution caused by overfertilization. Therefore, rising of farmers' awareness regarding the following of the results of soil analyses in the agricultural practices is the key factor.

5

ENVIRONMENTALLY FRIENDLY MANAGEMENT

Farmers, who applying for the environmentally friendly management scheme under the Rural Development Plan, should make a fertilization plan, in which will include information about the planned fertilization in each year of commitment.

Requirements for environmentally friendly management concerning the use of fertilizers

- ✓ maximum amounts of usage for manure nitrogen (170 kg/N/ha) and phosphorus (25 kg/P/ha)
- ✓ within nitrate-vulnerable area 170 kg/N/ha manure & mineral totally

Farmer must record in the field book

- ✓ date; work type; area(ha); type and name of fertilizer; amount and unit of fertilizer; nutrients N kg/ha; P kg/ha; K kg/ha)

6

AGRI-ENVIRONMENTAL PAYMENTS

The following agri-environment support (AES) measures are being implemented under Axis II of the Estonian RDP 2007-2013 (10 measures):

- ✓ support for less-favoured areas (2.1)
- ✓ Natura 2000 support for agricultural land (2.2)
- ✓ support for environmentally friendly management (2.3.1)
- ✓ support for organic production (2.3.2)
- ✓ support for keeping animals of local endangered breeds (2.3.3)
- ✓ support for growing plants of local varieties (2.3.4)
- ✓ support for the maintenance of semi-natural habitats (2.3.5)
- ✓ support for grazing animals (2.4)
- ✓ support for the establishment and restoration of stonewalls (2.5.1)
- ✓ Natura 2000 support for private forest land (2.7)

7

NUTRIENT BALANCE CALCULATION

- ✓ Balances are calculated for Nitrogen (N), Phosphorus (P) and Potassium (K) using the Farm Gate Balance methodology
- ✓ Nutrient balances equal: bought or brought NPK minus sold or removed NPK
- ✓ Nutrient balances provide information about environmental pressures. A nutrient deficit (negative value) indicates declining soil fertility. A nutrient surplus (positive data) indicates a risk of polluting soil, water and air.
- ✓ Input: mineral fertilisers, animal feeding stuffs (compound feed, coarse fodder), livestock, manure, biological nitrogen fixation by leguminous crops, atmospheric deposition of nitrogen, other inputs (seeds and planting material).
- ✓ Output: crop and livestock production, animals, manure, animal feeding stuffs.

8

DATA SOURCES

Rural Economy Research Centre (RERC)

- ✓ Farm Accountancy Data Network (FADN) data

Agricultural Registers and Information Board (ARIB)

- ✓ Register of agricultural supports
- ✓ Register of agricultural animals
- ✓ Field Register

Agricultural Board (AB)

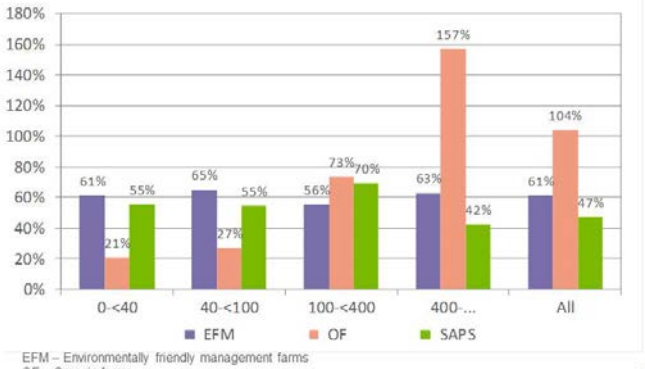
- ✓ Register of organic farming

Gross margin calculations

Expert estimations

9

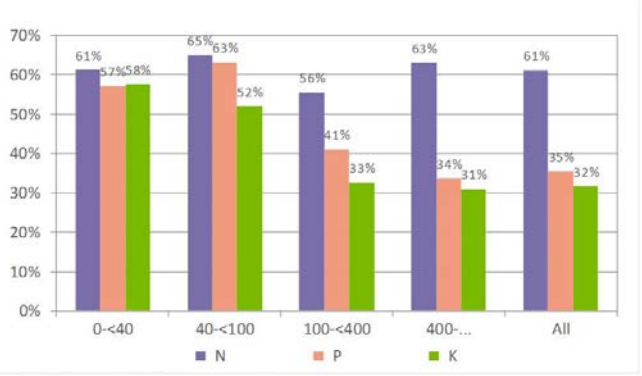
FARM GATE NITROGEN USE EFFICIENCY OF SPECIALIZED CROP FARMS, 2015



EFM – Environmentally friendly management farms
OF – Organic farms
SAPS – Single area payment scheme farms
Source: Own calculation based on FADN data

10

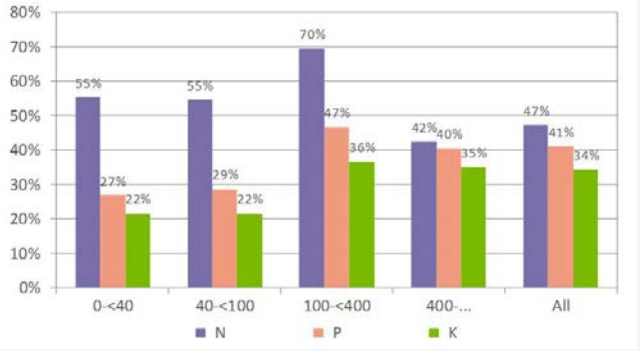
FARM GATE NUTRIENT USE EFFICIENCY OF SPECIALIZED CROP EFM FARMS, 2015



EFM – Environmentally friendly management farms
Source: Own calculation based on FADN data

11

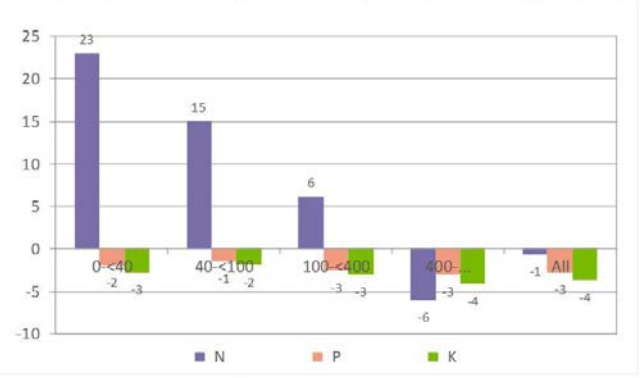
FARM GATE NUTRIENT USE EFFICIENCY OF SPECIALIZED CROP SAPS FARMS, 2015



SAPS – Single area payment scheme farms
Source: Own calculation based on FADN data

12

FARM GATE NUTRIENT BALANCE OF SPECIALIZED CROP ORGANIC FARMS, 2015



Source: Own calculation based on FADN data

13

MAIN PROBLEMS

- ✓ Insufficient data coverage regarding the share of different species of legumes for correct application of N fixation coefficients, which have great impact for specific agricultural systems e.g. for organic farming
- ✓ Insufficient data coverage regarding the proportion of legumes in the biomass of the collected and sold grass fodder (e.g. hay, silage)
- ✓ Quantities of purchased concentrated feedstuffs and coarse fodder as well as the composition of the different kinds of feed
- ✓ Amounts and type of manure supplied from other farms and the amounts transported to other farms

14

3.2 Analysing yields of organic and non-organic Farms in Austria

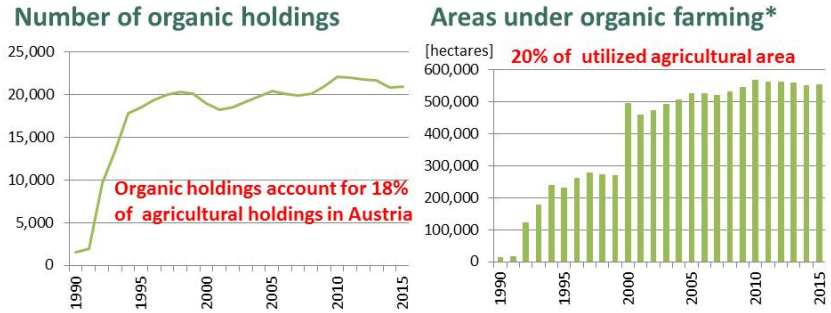
Thomas Resl

BUNDESANSTALT für Agrarwirtschaft
FEDERAL INSTITUTE of Agricultural Economics

Usage of FADN data for organic yield estimations

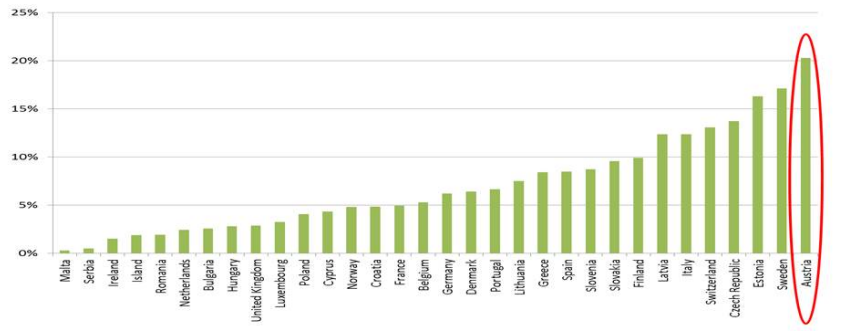
DI Thomas Resl, MSc. and DI Martin Brückler
Federal Institute of Agricultural Economics
Marxergasse 2, 1030 Vienna, AUSTRIA
thomas.resl@awi.bmlfuw.gv.at www.awi.bmlfuw.gv.at

Organic farming in Austria



Source: AWI (2016) 2

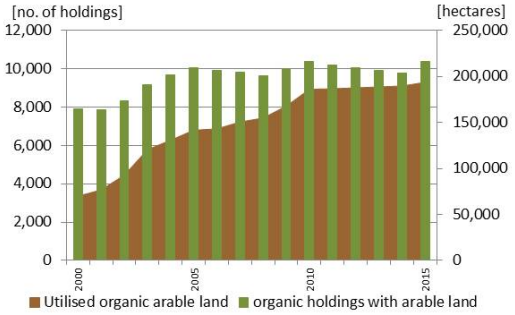
Share of utilised agricultural area under organic farming (in 2015, EU 28)



Source: Eurostat (2016) 3

Organic arable land

- There was a vast expansion of organic arable land, which almost tripled since the year 2000
- Increased attention is laid on the productivity of organic crop production



Source: AWI and Federal Authorities (2016)

4

Crop yields of organic farming

Organic agriculture (may) have lower crop yields

→ Demand for more land to produce the same amount of food

What is the relative yield performance?

- International research (meta-analysis)
  - Seufert et al. (2012): organic crop yields ~25% lower
  - De ponti et al. (2012): organic crop yields ~20% lower

5

Why to know organic crop yields?

- Politicians/ecologists/economists/extension service
  - Calculation of support provided for organic farms
  - Economic calculations (gross margin organic vs. conventional)
  - Calculation of ecological impacts per produced quantity
  - Self sufficiency rates of primary production (dependency on imports)
- Farmers need empiric evidence for their individual economic decisions

6

Crop yield data – present sources

Representative crop yield data is estimated on an annual basis.

- Statistics Austria (Federal Institute for statistics Austria)
  - Annual crop yield estimations (harvest declarations) based on voluntary observers
- AMA (Austrian Market Organisation)
  - Annual crop yield data based on weighted crop yields (Agricultural chambers)
  - There will be annual organic crop yield statistics from 2016 on!

Data is not collected separately (organic and conventional crop yields)

Organic farming statistics are limited to area under organic farming and number of holdings

7

FADN data base

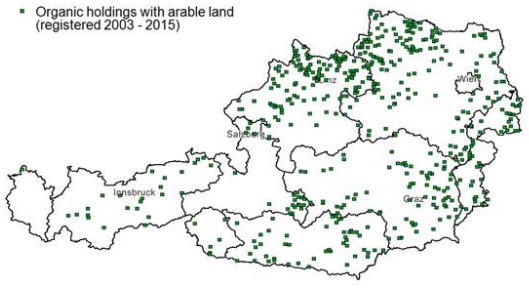
- In the framework of the FADN survey, crop yield data of conventional and organic farming systems is collected
- So far no regular use of this crop yield source
- Sporadic use for extrapolations

8

FADN data – arable organic and conv. farms

Number of organic holdings

Year	with arable land	with arable land without livestock	with arable land and livestock
2003	265	37	228
2004	281	44	237
2005	299	61	238
2006	296	55	241
2007	287	54	233
2008	285	52	233
2009	293	53	240
2010	297	62	235
2011	309	68	241
2012	319	81	238
2013	322	87	235
2014	320	86	234
2015	304	88	216



Source: AWI, 2016

9

Method (1)

- Crop yield averages are weighted on the level of
  - major agricultural production areas and
  - dry/humid agricultural areas.
- Organic holdings are slightly overrepresented in the FADN survey
- IACS data (acreage) was used to extrapolate the weighted averages of organic crop yields per crop type on a regional level*

- $CY_W = \frac{\sum_{i,cp} cy_i * ha_i}{\sum_{i,cp} ha_i}$

cy…crop yield
cp.. crop type
ha…hectares

Cyw = Weighted average crop yield per crop type and region*

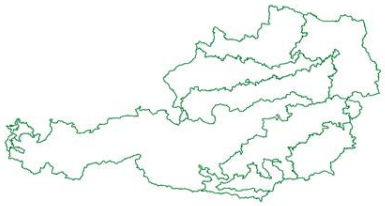
*Region/ Regional level = Major production area and dry/humid agricultural area, respectively

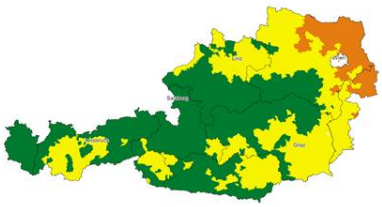
10

Method (2)

Two independent analysis

Major agricultural production areas **Dry/ humid agricultural areas**





11

Major agricultural production areas

8 major agricultural production areas

Agricultural production areas are characterized by different elevations, slope gradients as well as key characteristics of agricultural holdings

e.g. size and production activity

12

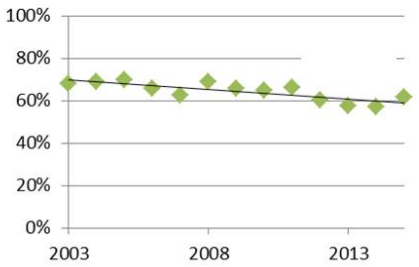
Relative organic crop yields per hectare compared to conventional crop yields

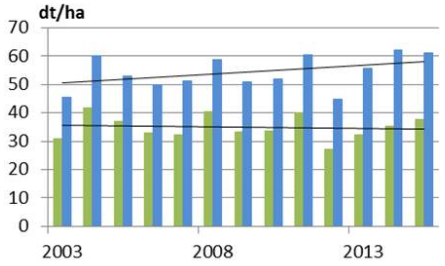
	Relative yield (%)	Standard deviation (±%)	n°	n°	area* (ha)
Cereals					
Common Wheat	64.7	33.8	1,333	10,271	26,278
Rye	61.3	47.0	1,315	2,722	12,530
Winter barley	61.2	38.2	496	7,434	4,317
Summer barley	66.1	46.2	759	5,952	5,693
Oat	66.6	48.7	983	2,865	6,742
Triticale	69.2	36.0	1,309	4,564	9,039
Corn	64.7	41.3	511	6,695	8,796
Spelt	63.2	41.6	826	225	6,577
Root crops					
Potatoes	52.2	50.9	1,555	4,226	2,309
Sugar beets**	71.0	-	-	-	638
Oilseed and protein crops					
Oil pumpkin	80.5	78.0	348	1,965	2,834
Field peas	58.1	57.5	493	1,882	5,750
Soybean	81.5	42.9	215	1,772	5,090

n^o = number of observations on organic farms; n^c = number of observations on conventional farms; *mean annual crop area under organic farming 2003-2014;**yield data of sugar beets only available from 2008-2015

13

Relative organic crop yields – Common Wheat





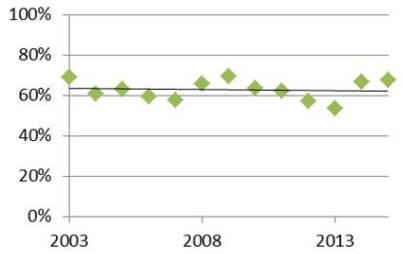
Number of documented crop yields

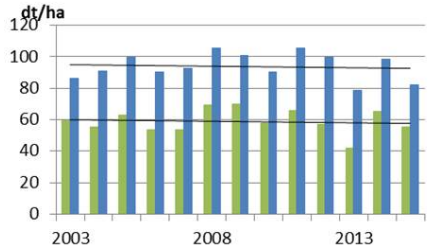
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Org	83	88	106	100	108	100	97	103	109	109	113	107	110
Conv	854	878	883	836	813	818	784	763	748	721	714	719	740

Source: AWI, 2016

14

Relative organic crop yields - Corn



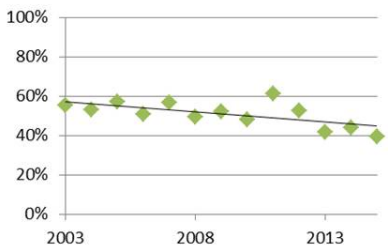


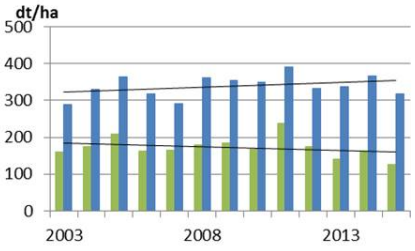
Number of documented crop yields

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Org	33	29	33	24	33	45	40	38	44	50	43	52	47
Conv	560	541	520	461	522	541	481	477	533	567	461	530	501

15

Relative organic crop yields - potatoes





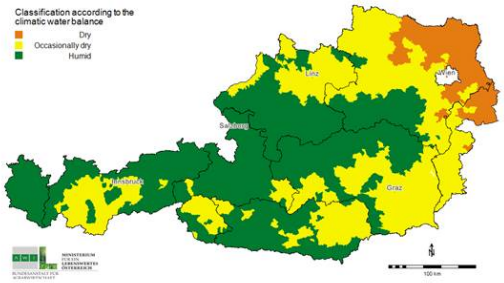
Number of documented crop yields

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Org	132	128	125	131	122	122	117	109	115	113	117	113	111
Conv	447	421	386	354	331	332	318	306	282	278	273	263	235

16

Dry and humid agricultural areas

- The Climatic water balance is calculated by the difference of precipitation and evapotranspiration
- The climate data is based on records between 2003-2015



Source: Own illustration based on Formayer , 2016

17

Cereals - Crop yields per hectare Dry/humid agricultural areas

		Humid			Occassionally dry			Dry		
		Org	Conv	Relative*	Org	Conv	Relative*	Org	Conv	Relative*
Common Wheat	dt/ha	35.8	64.7	55%	33.7	57.8	58%	35.8	48.8	73%
	n	149	1834		763	5544		421	2893	
Rye	dt/ha	31.7	45.7	69%	26.0	43.8	59%	26.3	40.6	65%
	n	170	345		961	1839		184	536	
Winter barley	dt/ha	37.7	57.7	65%	34.7	56.5	61%	30.7	48.7	63%
	n	108	2039		310	4619		78	774	
Summer barley	dt/ha	27.4	39.9	69%	27.6	40.0	69%	26.6	42.1	63%
	n	85	657		521	3004		153	2291	
Oat	dt/ha	26.4	44.3	60%	28.1	41.5	68%	30.0	35.8	84%
	n	162	889		763	1891		58	85	
Triticale	dt/ha	39.2	55.9	70%	36.4	50.9	71%	30.2	46.4	65%
	n	258	1277		925	3075		125	209	
Corn	dt/ha	61.7	100.2	62%	62.4	96.7	65%	57.1	76.8	74%
	n	40	959		236	4311		235	1425	
Millet	dt/ha				23.1	56.1	41%	18.8	36.4	52%
	n				25	100		50	228	
Spelt	dt/ha	21.4	23.8	90%	23.5	39.7	59%	27.3	39.3	70%
	n	82	49		584	128		160	48	

dt/ha = weighted average yield in decitonnes per hectare ; n= number of documented yield data between 2003-2015; *Relative yields organic to conventional

18

Oilseed and protein crops - Crop yields per hectare dry/humid agricultural areas

		Humid			Occassionally dry			Dry		
		Org	Conv	Relative*	Org	Conv	Relative*	Org	Conv	Relative*
Field peas	dt/ha		26.8		14.3	22.5	63%	13.7	25.3	
	n		227		274	920		201	735	
Fava beans	dt/ha	26.3	31.0	85%	19.1	25.4	75%	13.8		54%
	n	30	122		198	198		69		
Soybean	dt/ha		26.0		19.7	26.2	75%	23.0	21.3	108%
	n		361		121	1292		90	122	
Rapeseed	dt/ha		33.6			30.5			26.4	
	n		543			1718			965	
Sun flower	dt/ha		20.6		14.1	24.5	57%	19.1	26.0	73%
	n		36		67	681		43	1245	
Oil pumkin	dt/ha				4.3	5.5	79%	4.5	5.7	78%
	n				194	1739		149	205	

dt/ha = weighted average yield in decitonnes per hectare ; n= number of documented yield data between 2003-2015; *Relative yields organic to conventional

19

Further work packages

WP - Survey

Use of clover and alfalfa (just mulching or additional use) of farms **without** livestock. Correction of results if there is no utilization.

WP – Matching procedure

The purpose of this work package is to find comparable farms (organic to conventional) with similar production conditions (eg. size, area, produced crops, crop rotation)

20

Conclusion

- Strong demand to have empiric data of yields (different stakeholders)
- Organic farming at arable land produces in average lower yields than conventional farming (average app. 66%). Extend of yield gaps depend on:
  - Crops (cereals, oil crops, root crops, protein crops)
  - Region → in dry areas less disparity than in humid areas for main crops like wheat and corn (use of water capacity)
  - Disparity between organic and conv. crop yield is rising (advanced breeds)
  - Remain the utilizations (food, feed, energy) the same - decreases the self-sufficiency rate

21

3.3 Milking robots in Norwegian Dairy industry

Jostein Vasseljen

Robot milking in Norway

- Highest density of milking robots among the Nordic countries
- 200 - 250 new robots per year
- About 1 500 robots in Norwegian dairy farms (2015)
- More than 1/3 of produced milk runs thorough a robot
- Most of new farm buildings on dairy farms are equipped with robots
- Most important arguments for robots are welfare aspects
- High investments
- Uncertain economy

NIBIO Pacioli 24, Pristina September 2016 3

Why robot ?

- «Large» Norwegian dairy farms fit for one robot
- The robot can be more ergonomical than other milking systems
- Wages in Norway are high, the robot can replace hired labour
- Second hand robots are popular among smaller dairy farms
- The robot gives a lot of information about animal health (and other things)
- Let the farmer have a «normal» family life
- The robot is a highly esteemed member of the staff

NIBIO Pacioli 24, Pristina September 2016 4

Methodology

- 2013 first year of identifying robot milking in the Farm Business Survey
- 48 holdings identified with robots in 2013
- 61 holdings in 2014, 7 are organic holdings
- About 320 dairy holdings in the database
- Selected benchmarking group consisting of the same number of cows and other milking systems. Note that the organic holdings are taken out of the groups

- Compared top third and lowest third of robotic farms

Comparison milking systems 2014

	Robot	Other system
Holdings	54	37
Number of cows	40,4	40,1
Hectares	48	56
Rented land, hectares	25	28
Milk sold litres	298 900	271 400
Quota litres	331 000	288 300
Kilogram milk per cow	8 100	7 400
Kilogram meat per cow	195	262
Capital assets 1 000 NOK	8 080	5 976
Working hours per cow	97	107

Financial Results 2014

1 000 NOK	Robot	Other system
Output per holding	2 771	2 724
Variable cost	1 056	977
Gross margin	1 714	1 747
Fixed cost	831	802
Depreciations	365	278
Net income	519	666
Interest paid	274	173
Return om labour and own capital	431	736
Return om labour and own capital per man year	204	316
Earning capacity NOK per hour	108	160

Results robotic farms

- More milk and less meat produced caused a higher output
- Higher variable costs
- Lower gross margin
- Higher fixed costs
- Higher assets value and depreciations
- 58 per cent more interests paid
- 35 per cent less profitability

Best and lowest third among robot holdings, characteristics

	Top third	Lowest third
Holdings	20	20
Number of cows	40,0	37,9
Hectares	50	42
Rented land, hectares	26	24
Milk sold litres	305 800	273 400
Quota litres	321 300	318 200
Kilogram milk per cow	8 500	7 800
Kilogram meat per cow	191	164
Capital assets 1 000 NOK	7 001	8 413
Working hours per cow	93	96

Best and lowest third, financial results

1 000 NOK	Top third	Lowes third
Output per holding	2 871	2 517
Variable costs	930	1 095
Gross margin	1 940	1 422
Fixed costs	794	855
Depreciations	342	378
Net income	804	189
Interest paid	125	353
Return on labor and own capital	874	-10
Return on labor and own capital per man year	433	-5
Earning capasity per hour	207	10

Characteristics top third

- Higher number of cows
- More land hectares
- More rented land
- Higher quota and milk sold
- Higher percentage of quota filling (95/86)
- More milk per cow
- More produced meat (16 per cent)
- Lower asset value (17 per cent)
- Less labour input (3 per cent)

Financial results top third

- Higher output caused by more produced meat and better milk quality (better paid)
- Less costs (all over)
- Less depreciations and interests paid
- Top third got profitability, lowest third have no profitability

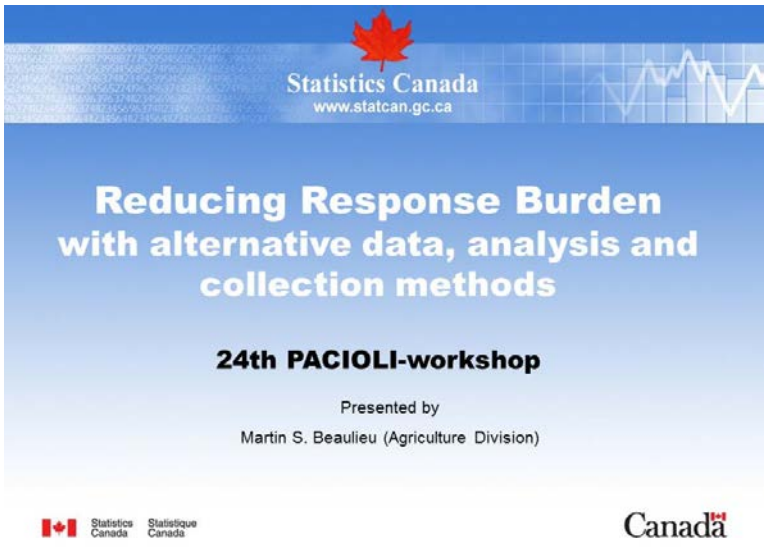
- Paper in Norwegian only, web-side:
  - https://brage.bibsys.no/xmlui/bitstream/handle/11250/2395869/NIBIO_POP_2016_2_22.pdf?sequence=3&isAllowed=y

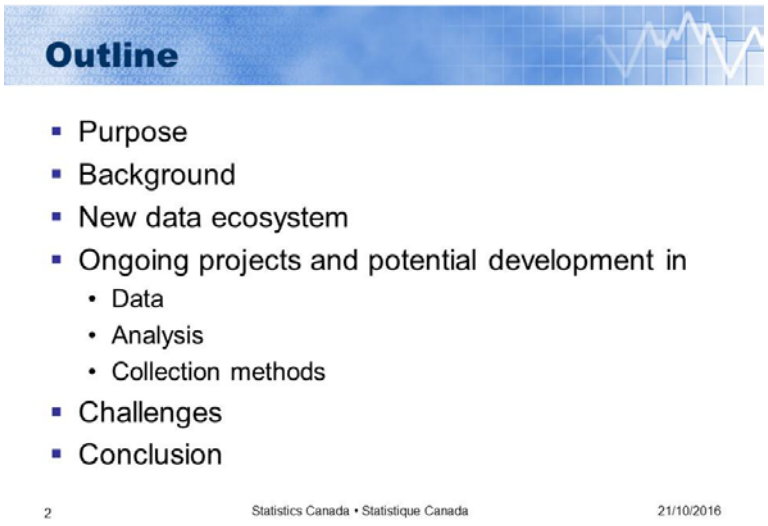
–Thank you for your attention!

4 Paper session III: Data collection issues

4.1 Reducing response burden by new data collection methods

Martin Beaulieu





Purpose

- We have made significant progress in replacing survey data with administrative and remote sensing data
- What else can be done to fill data gaps in agriculture statistics?
- What are the challenges to overcome?

Background

- Several data gaps identified during the 2016 Census of Agriculture Content Consultation
  - http://www5.statcan.gc.ca/olc-cel/olc.action?lang=en&ObjId=95-635-X&ObjType=2
  - Users want more detailed related to existing content
  - Users want new content on such as:
    - Agri-tourism
    - Animal welfare
    - Value chain and marketing channels
    - GMO
    - Grain storage on farm

Background

- Statistics Canada Agricultural Statistics Program
  - Census of Agriculture every 5 years
  - 17 surveys directly to farmers
  - Remote Sensing and Geospatial Analysis
  - Agricultural Taxation Data (more than 25 years)
  - Over 200 administrative data sources
  - New administrative data (crop insurance, income stabilisation program…)

A new data ecosystem

- A wave of technological changes :
  - New ways of generating and sharing data: new technological platforms
  - New data sources: Big Data and alternative data sources
  - New actors producing and consuming data: local, national, international, public, and private
  - New data governance models: Open Data
- More data at lower cost, accessible to more people, on common platforms/standards, from anywhere in the world

Alternative data in agriculture

- Data sources we should keep an eye on:
  - Internet of Things (IoT) – "Things" are sensors and devices that capture data and flow data to other devices: e.g. biochip transponders on farm animals, steer and control equipment, manage inputs at very precise levels across fields, detect crop stress
    - Precision agriculture
    - Track food along supply chain - sensor based technology
    - Smartphones "The pioneer species of the IoT is the smartphones. Every time we take a smartphone with us in a car, it beams information on our location and speed to Google. The result is real-time traffic information that can be used by everyone." Source: http://qz.com/156075/internet-of-things-will-replace-the-web/
  - Smart meters
  - Social media – food consumption behaviours, trends and attitudes

Earth observation & remote sensing

- Very high resolution remote sensing
  - E.g.: Sentinel-2, 20-60m resolution, global coverage, every 5 days; this is now Open Data
- Derived data products
  - Model-based Principal Field Crop Estimates
    - developed and tested on the crops that are typically published within the September Farm Survey
    - accounts for approximately 98% of the agricultural land in Canada
    - Alberta, Saskatchewan, Manitoba, Ontario and Quebec
    - 3 weeks in advance of the September Farm Survey, and
    - 11 weeks in advance of the November Farm Survey
- The Daily: http://www.statcan.gc.ca/daily-quotidien/150917/dq150917c-eng.htm
- CANSIM Table 001-0075: http://www5.statcan.gc.ca/cansim/home-accueil?lang=eng&p2=50&HPA

Alternative analytical methods

- Record linkage implies combining two or more micro-records to form a composite record combining information about the same entity (e.g. a business or an individual)
- Linkages are potentially important sources of valuable statistical information. But there are privacy concerns
- Canada has developed a policy framework permitting data linkage

Examples with farm taxation data

- 2015 Farm Financial Survey
  - Replacement selected revenues and farm expenses
- Agriculture Taxation Data
  - Uses the Census of taxation records of farm operations (unincorporated and incorporated)
- Longitudinal Census – taxation data
  - Productivity study

Business microdata linkage using the LFE: potentials and challenges

- For business data (including farm businesses), the Agency has developed a Linkable File Environment (LFE) facilitating the linkage of pre-approved databases
- The LFE brings together microdata holdings of Statistics Canada from both **administrative and survey sources**
- At the core of the LFE there is the Business Register (BR), which is used to identify the Business Number and implement all linkages
- Currently, LFE is intended to link records and to extract databases for analytical purposes

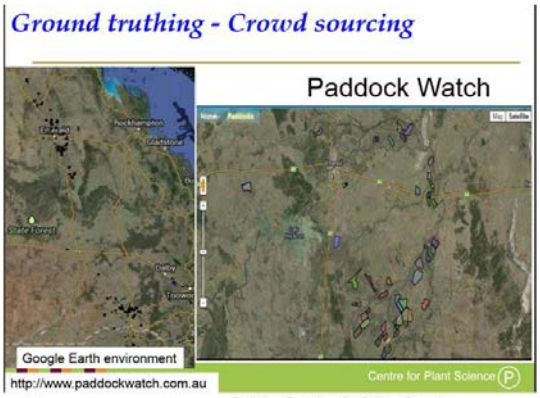
Crowdsourcing

- Much of the work on crowdsourcing agricultural data conducted in developing countries where there is lack of data
- Can we use crowdsourcing to reduce response burden and fill data gaps?
- Recently, Statistics Canada initiated a pilot project aimed at understanding the potential of crowdsourcing for statistical purposes – to describe characteristics of buildings

Crowdsourcing

- Collection will officially launch on October 2016
- The project is making use of OpenStreetMap as a platform for inviting contributors to crowdsource information on buildings
- Contributor will be able to input the location, physical attributes and other features of buildings
- A customized OSM editor will be used for this purpose
- The pilot will focus on the Ottawa-Gatineau region for now

Crowdsourcing in agriculture – an Australian example



A centralised hub for collecting and recording 'Ground Truthing' data.

Utilised to calculate total crop area planted and total crop volume.

By contributing information, users can win an mini iPAD.

Takes 30-45 minutes, depending on the number of fields that the user wants to record.

"Click on the Paddock Watch link and start entering your fields to go into the draw for a mini iPAD."

Challenges to crowdsourcing

- Accessibility
  - The Government of Canada has standards that may not be applied by third party providers
- Acceptability and willingness to participate
  - Voluntary
  - Incentives to participate?
- Privacy and confidentiality protection
  - Informed consent for research and statistical uses of shareable information
  - Not for collecting sensitive information (could be viewed by the crowd)

Challenges to crowdsourcing

- Security
  - Third service providers standards (before sent to NSOs)
  - Agreement under Section 12 *Statistics Act*
    - *enter into an agreement with any … or other corporation for the sharing of information collected from a respondent by either Statistics Canada or .. corporation on behalf of both of them and for the subsequent tabulation or publication based on that information*
- Data quality and selection bias
  - Not every person with smart phone, mobile devices, GPS…
  - Crowdsourcing and potential false answer
  - Selected crowd (collection not fully outsourced)
- Building a business case for sharing
  - Proprietary value of privately held data

Conclusion

- Change in users expectations for timeliness, detail, frequency
- NSO's roles
  - Trusted party to certify alternative data quality
  - Promote the use of best practices
  - Partner and collaborate with other (private/public) data providers
- Explore, learn, adapt new technologies for data collection, processing, analysis and dissemination

Questions/contacts

Analysis and Outreach, Agriculture Division

Martin S. Beaulieu
martin-s.beaulieu@canada.ca

Centre for Special Business Projects, Crowdsourcing data collection pilot

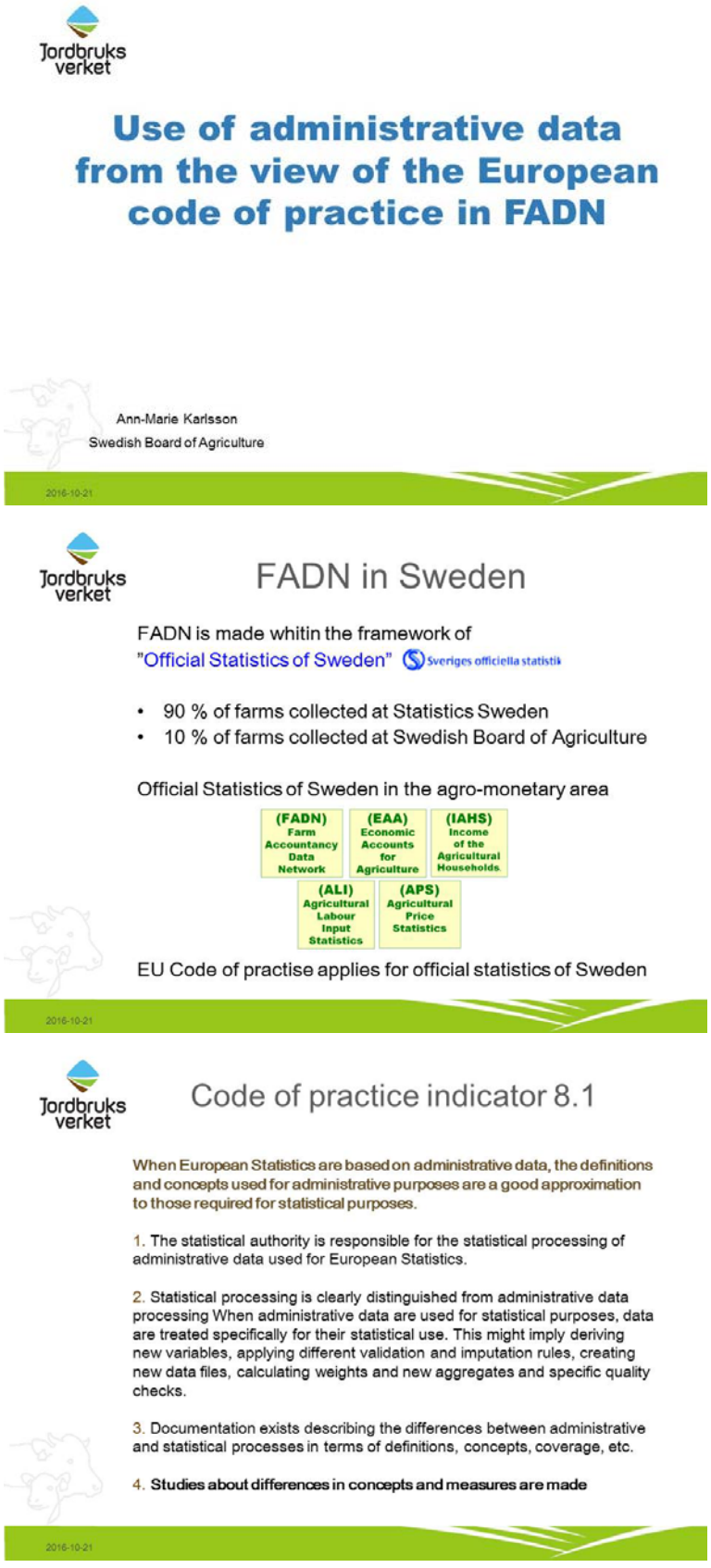
Alessandro Alasia
alessandro.alasia@canada.ca

Remote Sensing and Geospatial Analysis, Agriculture Division

Gordon Reichert
gordon.reichert@canada.ca

4.2 Use of administrative data from the view of the European code of practise regarding statistics

Ann-Marie Karlsson



Quality frameworks

Quality framework Daas et al.

Hyper-dimensions of

1. Source
2. Metadata
3. Data

Dimensions

- Quality indicators

Quality framework Laitla et al.

1. OK as it is for statistics
   - output data quality,
2. OK after processing
   - production process, input quality.
3. Improve the statistical system
   - Production process quality

2016-10-21

Sources of data for Swedish FADN

Statistical registers/surveys

- Farm Register (FSS)
- Crop survey
- Horticulture survey
- Price statistics

Directly from farmers

- Labour input
- Yields (if not included elsewhere)
- Inventories of buildings, equipment, machinery (only year 1)
- Inventories of stocks
- Investments
- Basic information

Other data sources

- IACS data on (subsidies) (areas), (crops)
- Central cattle data base (cattle)
- Taxation registers (value of farm)
- Organic control bodies (Organic production)
- Accountancy data (sometimes extended with stocks etc.)
- Swedish milk (milk deliveries)

2016-10-21

Quality frameworks

	IACS Subsidies Areas Crops	Central cattle data base (Nr of cattle in stocks purpose of sales)	Taxation register value of farm	Control bodies for organic production	Accountancy data	Swedish milk
Source dimensions						
1. Supplier	+++++	+++++	+++++	+++++	+++	+++
2. Relevance	+++++	++++	+++	++++	++++	+++++
3. Privacy & security	+++++	+++++	+++++	+++++	+++++	+++++
4. Delivery	+++++	+++++	+++++	+++	+++	+++++
5. Procedures	+++++	+++++	+++++	++++	++++	++++
Metadata dimensions						
1. Clarity	+++++	+++++	+++++	+++	+++++	+++++
2. Comparability	+++++	+++++	+++++	++++	+++	+++++
3. Unique keys	+++++	+++++	+++++	++++	+++++	+++++
4. Data treatment	+++++	+++++	+++++	+++	++++	+++++

2016-10-21

Quality frameworks

	IACS Subsidies Areas Crops	Central cattle data base (Nr of cattle in stocks purpose of sales)	Taxation register value of farm	Control bodies for organic production	Accountancy data	Swedish milk
Data						
1. Technical checks	+++++	+++++	+++++	+++++	+++	+++
2. Over-coverage	+++	+++	+++	++++	++++	+++++
3. Under-coverage	++++	+++++	+++++	+++++	+++++	+++++
4. Linkability	++++	+++	++	++++	++++	+++++
5. Unit non-response	+++++	+++++	+++++	++++	+++++	+++++
6. Item non-response	+++++	+++++	+++++	++++	++	+++++
7. Measurement	+++++	+++++	++	++++	++++	+++++
2. Processing	+++++	+++++	++	++++	+++++	+++++
3. Precision	++++	+++	++	++++	++	+++++
4. Sensitivity	+++++	+++++	+++++	+++	+++++	+++++

2016-10-21

Starting point - the users

EU:Administrative use

- Report according to (EG) nr 834/2007

EU:Statistical use

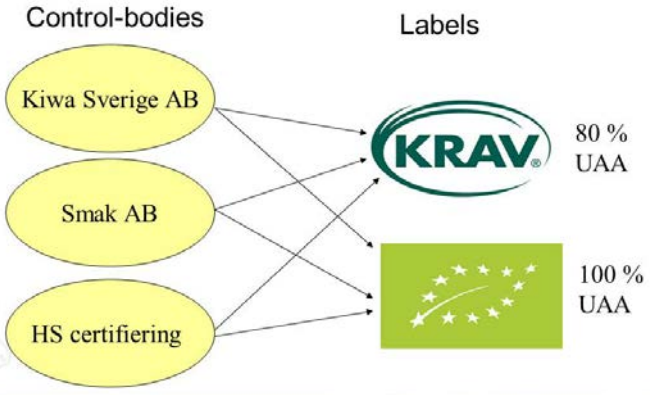
- FSS
- FADN (areas, crops, animals, animals slaughterd)

Aditional swedish use

- Swedish official statistics regarding areas, nr of animals and production
- National environmental indicators

2016-10-21

Supplier: Control-bodies



What the consumers see

2016-10-21

Procedures
Legal prerequisites

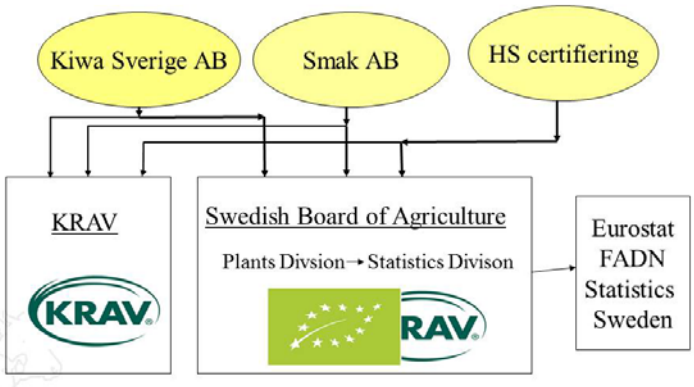
Transmission of data

- Informal agreement
  - The "KRAV-software" has an added module with "EU-certification not KRAV".
  - The module fulfills the demands in the regulation
- The Swedish regulation
  - Specifies variables to send to the Swedish Board of Agriculture

2016-10-21

7

Delivery: the reporting



2016-10-21

Control body register

Clarity- comparbility- unique keys - data treatment

Information about the holding unique identiferis

Crops

- Organic crops and organic areas during the year

Animals

- Average number of dairycows and sows during the year
- Highest number of ewes in this year´s production
- Number of slaughtering pigs produced during the year
- Born or bought calves during the year
- Number of cows sold for breeding less than 4 months old

2016-10-21

Quality frameworks

	Control bodies for organic production
Source dimensions	
1. Supplier	++++
2. Relevance	+++++
3. Privacy & security	+++++
4. Delivery	+++
5. Procedures	+++++
Metadata dimensions	
1. Clarity	+++
2. Comparability	++++
3. Unique keys	++++
4. Data treatment	+++

2016-10-21

Farm register

Information about the holding including keys from other registers

FSS-years (Reference day first Thursday in June)

- Areas, animals
- Information about the holding including keys from other registers

Other years (Reference day first Thursday in June)

- Cattle is updated every year from Cattle database
- Surveys on animals covering sheep, pigs and poultry
- Last known value

2016-10-21

FADN- all years

Organisational information

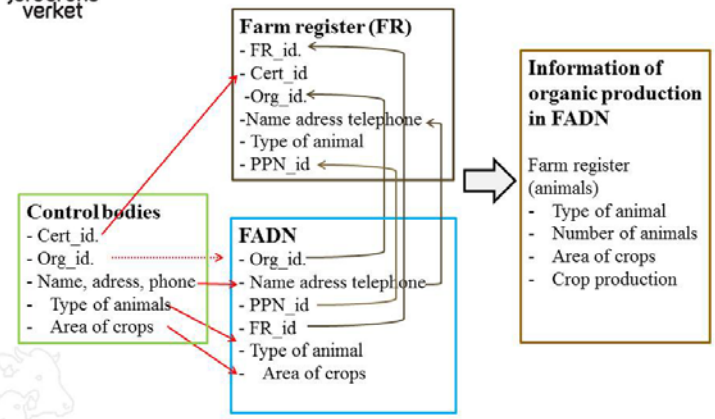
- All information from Farm register including organisational id of the holder, Production place numbers for the cattle register, FSS_id
- Information on linkage FADN-Farm register (FSS)

FADN-variables

- Number of animals in stock
- Number of animals sold
- Area of crops
- Crop yields

2016-10-21

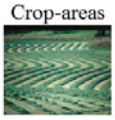
Linkability



2016-10-21

7

How organic register isused for FADN

Animals	Animal production	Crop-areas	Crop production
			
Holdings FADN (IACS) + Control reg.	**Holdings** FADN (IACS) + Control reg.	**Holdings** FADN´(IACS) + Control reg.	**Holdings** FADN´(IACS) + Control reg.
Variables FADN (cattle, FADN-survey)	**Variables** FADN (swedish milk, survey)	**Variables** FADN (IACS) + control reg.	**Variables** FADN (Survey) Sometimes cropsurvey

2016-10-21

Tecnical checks

- Big differences of area of crops
- Not the same crop
- Duplicates between control-bodies
- Not the same type of animal

2016-10-21

Quality frameworks

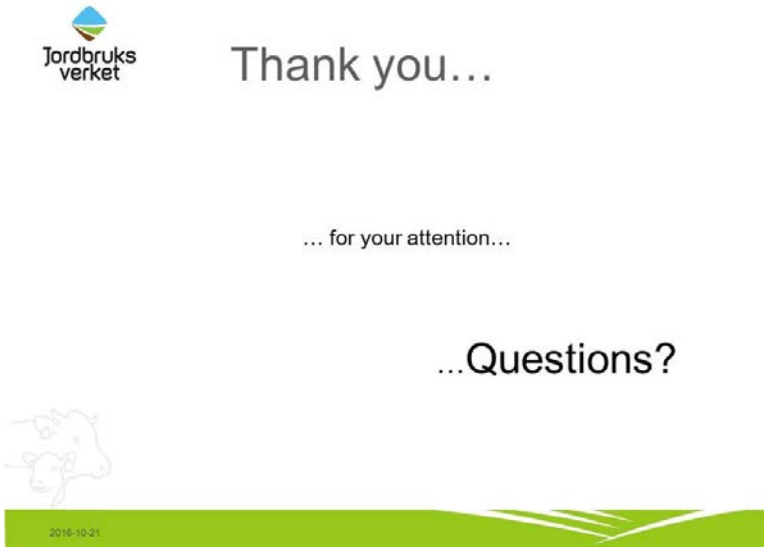
	Control bodies for organic production
Data	
1. Technical checks	+++++
2. Over-coverage	++++
3. Under-coverage	+++++
4. Linkability	++++
5. Unit non-response	++++
6. Item non-response	++++
7. Measurement	Not relevant
2. Processing	+++++
3. Precision	Not relevant
4. Sensitivity	Not relevant

2016-10-21

Positives

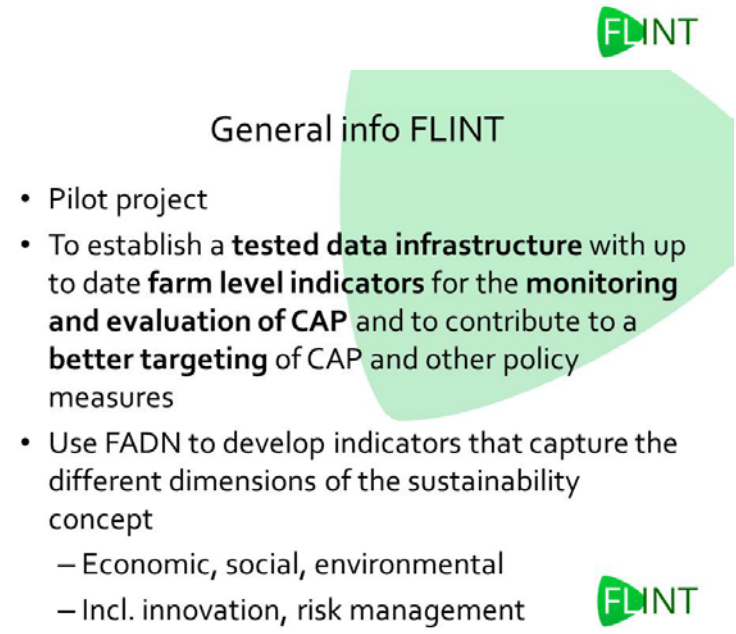
- Benefit from the work for the organic statistics
- Benefit from the work with linking between adminstrative registers and the farm register
- Reduced responseburden
- Better data quality

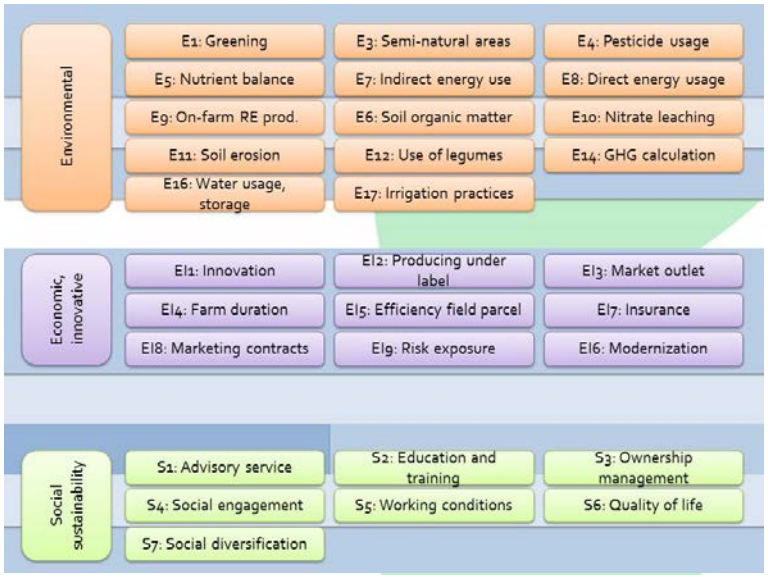
2016-10-21


Jordbruks verket
Thank you…
… for your attention…
…Questions?
2016-10-21

4.3 Polish experiences in collecting FLINT data from FADN farms

Piotr Czarnota





Different types of FADN data collection

- **No standardised approach**
- **Countries with Type X**
  - Data provided by (fiscal) accountants
  - Re-use of accounting data for FADN purposes
  - Less Expensive
  - More difficult to make changes
- **Countries with Type Y**
  - FADN Data collection by FADN liaison agency (or delegated to other)
  - Dedicated FADN data collection
  - Relatively expensive way to collect FADN data
  - More flexible to make changes in data collection

FLINT

Data collection in FLINT

Country	Who collects FLINT data	Link to FADN data collection
France	Agriculture students	Separate
Ireland	Researchers+NFS data collectors	Yes
Spain	Farm advisors and accountancy offices	Separate
Poland	Agricultural advisors (same as for FADN)	Yes (but separate agreement)
Greece	2 agronomists – researchers data collectors	Separate (with FADN data collectors)
Hungary	Accounting offices a (same as for FADN)	Yes (but separate agreement)
Netherlands	Advisors (same as for FADN)	Direct connection
Germany	2 researchers	Separate but in coop with FADN liaison agency
Finland	ProAgria-FADN data collectors	Separate (with FADN data collectors)

FLINT – organization of survey in Poland

- **146 farms**
  - 25 + 1 milk farms
  - 25 + 1 crop farms
  - 25 + 1 permanent crop farms
  - 25 + 1 pigs farms
  - 40 + 1 mixed
  - 1 small farm (below threshold of 4000 euro SO)
- **15 data collectors**
  - Data collectors selection
  - Kick-off meeting autumn 2014
  - Second meeting spring 2015
  - Third meeting - data collection training winter 2015
- **4 FADN regions**

FLINT

FLINT – organization of survey in Poland

- **FLINT questionaire (10 tables)**
  - Based on FLINT data definitions
  - Translated (in PL) and adjusted to Polish conditions
  - Skipped issues already present in Polish FADN (animals, crops, feed stuffs)
- **FLINT instructions**
- **Separate methodology and software for pesticides**
- **2 trial farms**
- **Contracts**
- **FLINT data by end of May (all 146 farms)**
- **FADN data priority in FLINT farms**
- **All FADN and FLINT data ready by August 2016**
  - data available for specific case studies

FLINT

General experience

- **Some data already in Polish FADN – no need for full FLINT data collection**
  - FADN data merged with FLINT data in a backoffice
- **Many FLINT variables partially available in FADN i.e. if some monetary value present in FADN, data collectors could ask for quantity**
  - reduces information collected from farmers and directs the interview

FLINT

General experience

- **Relationship with FADN data collector was crucial for participation in FLINT**
  - low rate of refusal
  - bilateral advantages motivated farmers to participate
- **Meticulous selection of data collectors – advisors well experienced in farm level data collection – knowledge/skill of data collectors important**
  - knew how to approach the farmer to get participated in the project
  - explain the objectives of data collection, sustainability issues
  - ensure quality of data collected
  - keep the deadline for data collection
  - treat FADN farms taking part in FLINT with priority

FLINT

General experience

- **Minimum 5 farms per data collector in order to get experienced in FLINT data collection**
  - collection of new data always causes some initial problems and need for adaptation
- **Perceived importance and awareness of sustainability and farm impact on environment varies by farmer**
  - Connection between questions and sustainability issues needed additional explanation
- **Farmers were surprised by number of questions they were asked**
  - even though they answered everything
  - FLINT partners aware that there are many questions – even concorcium had doubts about certain criteria but this is a research pilot project which aims to test in practice data collection,

FLINT

Data collection experience

External sources of information

- **FADN (nearly all tables)**
- **SAPS application (e.g. greening)**
- **Insurance policy**
- **Contracts**
- **Invoices (e.g. energy), receipts**
- **Crop protection evidence**
- **Certificates (e.g. integrated production, organic farming)**
- **Land registry (land parcels)**

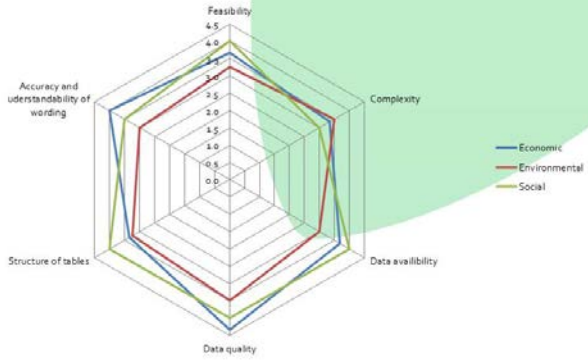
FLINT

Data collection experience – time required

- **Average time needed varied by type of farming from 2,5 hour till 12 hour per farm**
  - Field crops 2,5 – 8h
  - Permanent crops 2-9h
  - Milk farms 2,5-12h
  - Pig farms 2,5 – 12h
  - Mixed 2,5-10h
- **Includes FADN data analysis before the interview,**
- **Face to face interview**
- **Use of other external sources**
- **Final questionaire fulfilment**

FLINT

Summary of data collectors experience



1 (poor), 2 (fair), 3 (good), 4(very good), 5 (excellent)

FLINT

Social

- **Straightforward questions, easy to give quick answer,**
  -no external sources required,
- **Some social variables needed broader explanation**
  - at first farmers were hesitant to reveal information concerning their private aspect of life (social engagement),
  - FADN is oriented on economic performance of the holding,
- **Advisory was a tricky question,**
  - farmers hesitant to disclose other sources of advice in front of public advisor,
  - no record of the number of visits – just guessing,
- **Some questions seemed to be sensitve to farmers,**
  - financial involvment in other companies.

FLINT

Environmental

- **Some definitions used in the questionaire were different from how farmer perceives it**
  - i.e. soil erosion
- **Farmers find water quantity estimation difficult**
- **As for energy, farmers reported only sources that were easy to measure (fuel, electricity)**
- **Land management**
  - parcels – no need to use LPIS
- **Pesticides**
  - the biggest, **but successful** challange – needed to work out purpousful methodology
  - problematic data in small farms
  - in permanent crops farms was time-consuming – lots of pesticides used

FLINT

Economic

- **Innovations were found difficult to explain**
- **Off-farm employment and contracts were perceived as sensitive issue**
- **Buildings**
  - number of places, m^2, m^3 needed estimation

FLINT

Costs

~ **100 euro** for 1 completely fulfilled questionaire free of errors.

No differentation between type of farming or economic size of the farm

included: travel expences, phone consultations, remuneration

excluded: data entry

FLINT

Conclusions

- Collection within FADN system provides advantages in terms of farmers participation and data quality assurance
- Data collectors do not find sustainability data collection too complicated – first year of FLINT data collection far less complicated than first year of FADN
- Data was collected thanks to good cooperation between advisor and farmer worked out during long-term FADN experience
  - Trust and confidentiality

FLINT

Conclusions

- FLINT is a pilot project and reduction of variables is forseen based on experience – due to difficulty to collect or sensitiveness for farmer
- Farmers answered all the questions required by FLINT data collection although some caused problems
- With some adaptations and clarifications it would be feasible to collect FLINT variables in Polish FADN in the future

FLINT

Thank you for attention ☺

czarnota@fadn.pl

FLINT

5 Workgroup session 1: Sustainability data collection in FADN

5.1 Description of session

Recent evaluations (for example the Court of auditors) have shown limitations in the possibilities to evaluate the common agricultural policy with the available data in FADN. The common agricultural policy has evolved since the early sixties of the previous century. In its inception phase, it was focused on providing food security for Europe and a fair standard of living for farmers in order to assure the continuity of agricultural production. Since then, a lot of things have changed. Societal expectations with respect to agricultural production have broadened. Society does not only expect a continuous availability of food, but also has a wide set of additional requirements with respect to food quality, food safety (for example use of pesticides, use of antibiotics), the environment (greenhouse gas emissions, acidification, eutrophication, pesticide use) and the role of agriculture in rural areas. Part of these concerns have also been included in the latest Common agricultural policy. However, the current monitoring systems lack the data for proper monitoring and evaluation of these topics.
The FLINT project addresses these issues. The FLINT project has defined a set of environmental and social indicators, and these indicators have been collected on FADN farms in addition to the normal FADN data collection. The FLINT project has come into phase that recommendations to the EU are formulated about the future data collection.

Collection of data
Earlier discussions have revealed that a major concern in extending the data collection is the increase of workload. There are a few options to reduce the workload, to compensate for the additional work to collect environmental and social data.

- Decrease of FADN sample, by 25 or 50%
- Collection of environmental or social data not in every year but in each Nth year.
- Re-Using data from other systems:

- What are the possibilities and consequences of these options for your country?
- Which is your preferred option and why?
- Do you see other options to reduce the workload?

Use of data
It is often claimed that the FADN sample is designed for economic use of the data. Please discuss the implications for the sample design in case environmental and social data are collected in FADN.

- Is the fadn sample designed for economic research, why yes? why not?
- Should changes be made to the sample design, when environmental and social data are collected? What are these changes?
- What are the consequences of these changes for the regular use of fadn data?

IT-infrastructure
Changing data collection also demands changes in the IT infrastructure. Collecting new data can affect different aspects of the IT system: data entry, database design, data checking, reporting etc.

- What are the overall possibilities to adapt your IT system to other data needs?
- What do you see as the main challenges in adapting your system to environmental and social data?

5.2 Group formation

IT	Data collection	Data collection	Data Use	Data use
Group 1	*Group 2*	*Group 3*	*Group 4*	*Group 5*
Daniel Hoop	Marju Aamisepp	Maja Kožar	Martin Beaulieu	Adelina Maksuti
Edona Mekuli	Zuzana Hlousková	Henrik Bolding Pedersen	Christopher Burns	Eduard Matveev
Mika Sulkava	Constanze Hofacker	Jasna Putar	Piotr Czarnota	Harold van der Meulen
Jan Derk Verweij	Iva Hvízdalová	Christian Scheutz	Ann-Marie Karlsson	Thomas Resl
Eugene Westerhof	Szilárd Keszthelyi	Hakile Xhaferi	Ben Lang	Lucian Emanuel Stanca
			Jostein Vasseljen	Neil White

5.3 Group I

IT-infrastructure

- Switzerland has a 'normal' FADN system, plus a subsample for environmental data. It was a life cycle analysis in the past but now there are only some indicators left. Problem to bring together all indicators developed by different scientists in different software.
- Finland: Flexible system that is suitable for adding new variables, takes some time but can be done. Has to be done by IT specialist though.
- Kosovo: data collection in Excel, extraction via SQL. Can be easily extended new variables, but there is no system behind it so this will be difficult (no IT skills available).
- NL: FADN data system (15 years old), already antibiotics and pesticides etc was present. FADN system is flexible and procedural (no programming), adding FLINT took a lot of time because of huge amount of variables.

One FADN system for all?

- A lot of homebuilt systems for FADN data, some have no system.
- Would it be possible to have one system for all?
- Data collection process is different for diff countries.
- Level of detail is different.
- Combining economic and environmental data: quality control, but also harmonize the data collection process (combined surveys etc).
- Switzerland was planning to do a full, medium and light version for data collection, NL does the same
- Reasons: cost efficiency, better response rates
- Consequence for IT systems: modular design
- Overall possibilities to adapt IT systems: Finland & NL no problem, Switzerland has to go modular, Kosovo no problem because no software
- Go open source? Available systems too old, plus closed systems.
- So perhaps build a new system from scratch in cooperation?

5.4 Group II

Decrease of FADN Sample

Contra

- Against the representativity
- Less research possibilities
- Technical implementation

Pro

- Less budget

Collecting data not in every year

Contra

- Fixed cost (factor) of data collection is very high
- Organisational problems
- Data quality problems, since we cannot connect the data every year

Pro

- Less budget
- Some questions should not be asked every year

Re-using data

Contra

- Data confidentially
- Black and grey economy

Pro

- Decreasing the burden of the farmers
- Speed up data collection
- Less budget

Other issues concerning data collection

- No trained data collectors
- Legislation problems
- Representativity (sub-samples may needed)
- IT solution from Commission (harmonised IT development)
- FADN as an statistical tool?
- Convincing the farmers for data collection
- Payment for farmers (even on EU level),
- Changing the regulation (make it obligatory)

5.5 Group III

Decrease of FADN sample: strongly disagree

	Croatia	Denmark	Kosovo	Slovenia	Sweden
Decrease FADN sample:	No	Possible	No	No	Possible
Main reason:	Losing too much valuable information (especially for small types of farming)				

Collection every year or each n-th year: with each FSS

	Croatia	Denmark	Kosovo	Slovenia	Sweden
Each or n-th year:	n-th year (with FSS data)	n-th year (with FSS data)	n-th year (with FSS data; if KAS agrees)	n-th year (with FSS data)	n-th year (with FSS data)
The main reasons:	FSS sample bigger	Too much costs/respondent burden, limited space on FSS survey	No other alternative, because the sample was just increased	Too big increase in respondent burden and work load	FSS every year, but too big increase in work load

Re-using data from other systems

- Strongly agree.
- **Increase the level of interoperability of databases, data exchange** (especially less experienced countries).
- **Co-ordination of samples** (FADN vs. FSS); Denmark – in 2017 (every FADN farm will be in FSS).
- **Preferred options, options to reduce the workload:** „Digital by default", „once only" (use multiple times).

5.6 Group IV

Is FADN sample designed for economic research?

Yes,

- but already there are many data that are regarded as social in FADN.

There was project in UK on environmental and social apsects that looked at FADN because there were some social data (AWU, education, age of farmer, whether there is tourism on the farm or not)

- or environmental data NPK, values of pesticides and so on.

Should changes be made to the sample design when environmental and social data are collected

- There are pros and cons.
- What research problems are the most interesting to us.
- Social aspects are more important in a small farms.
- If there were more social aspects, than FADN sample would have to be changed in a way that it captures small farms also.
- On the other hand including lot of small farms would cause many economic and production problems.
- Some policies are focused on issues such as carbon emissions, water, energy which much more concern big producers, so if we want to focus on environmental data, than we should design the sample in a way that it captures more big farms, as they impact environment more than small farms.
- There are some indirect environmental data in FADN (NPK, value of pesticides).
- Risk of non response or missing data (because there are many sensitive questions to farmers, we have to be careful as farmers can drop out the next year).

Consequences

- Increased interest in FADN data.
- Because of small amount of additional data on environmental and social aspects, there is huge amount of data for analyses because of the combination with FADN data.

5.7 Group IV

Is the FADN sample designed for economic research, why yes? Why not?

Yes

- mainly based on economic output of farms.
- Farm perfomance data.
- There is still more space for more economic analyses.

Schould changes be made to the sample design, when environmetal and social data are collected? What are these changes?

- Is the econmic impact efficient enough?
- Not only revenues and costs, also the amount used could be an useful information (e.g. amount of fertilizer).
- New output - e.g. environmental results calculated with new weigthing factors of sample (e.g. organic farming).
- Farm income versus household income (social data)
- Is there a possibility to use administrative data for environmental and social outputs?
- Additional information collected (project based?)
- Should we reduce econmic indicators?

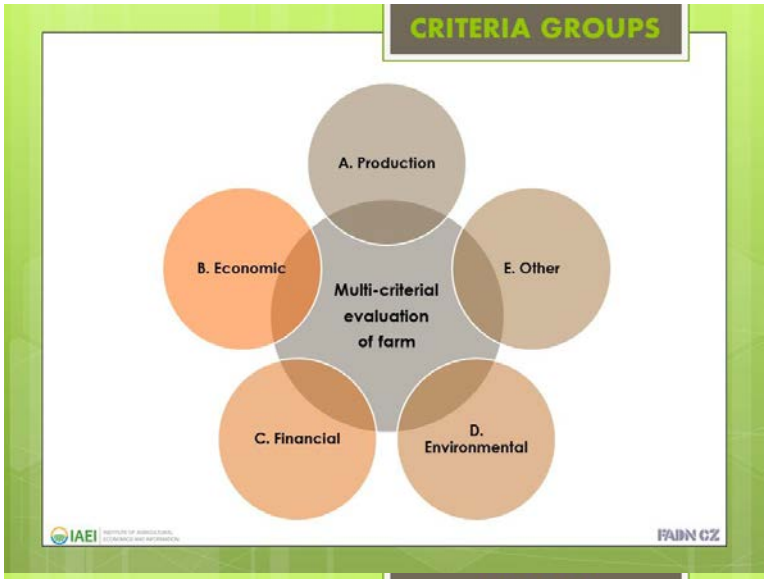
What are the consequences of these changes for the regular use of fadn data?
Reducing economic data while increasing einvironmetal and social data.

- Increase the value of the FADN Data.
- More use of the data – self financing (data for additional research projets).
- Environmetal indicators very important for politicians and public.

6 Paper session IV: Methods for farm results

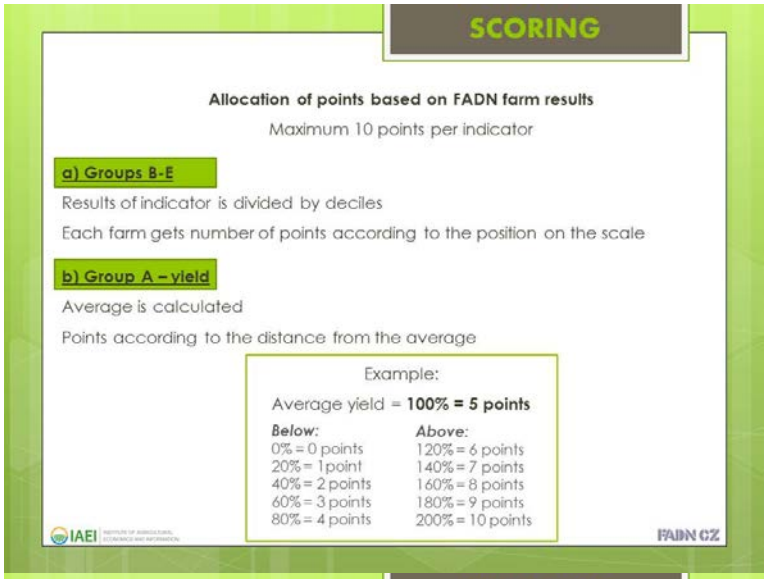
6.1 Multi-criteria evaluation of farms based on Czech FADN

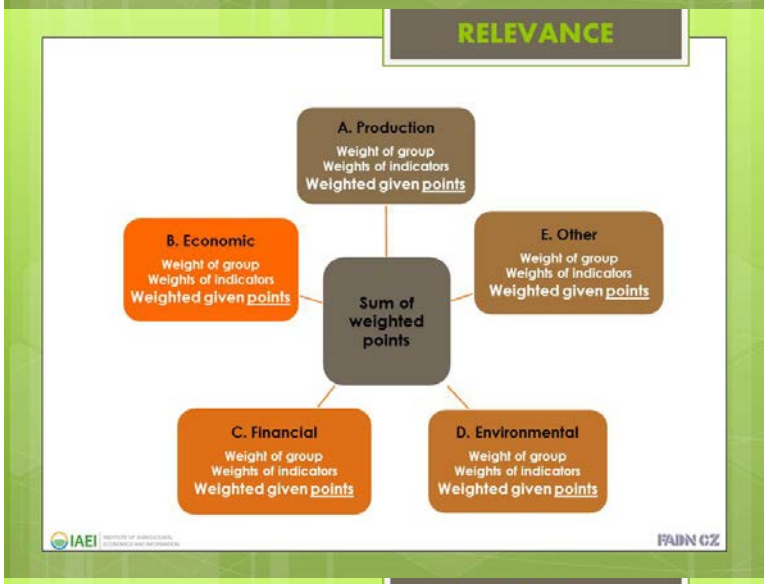
Zuzana Hlouskova

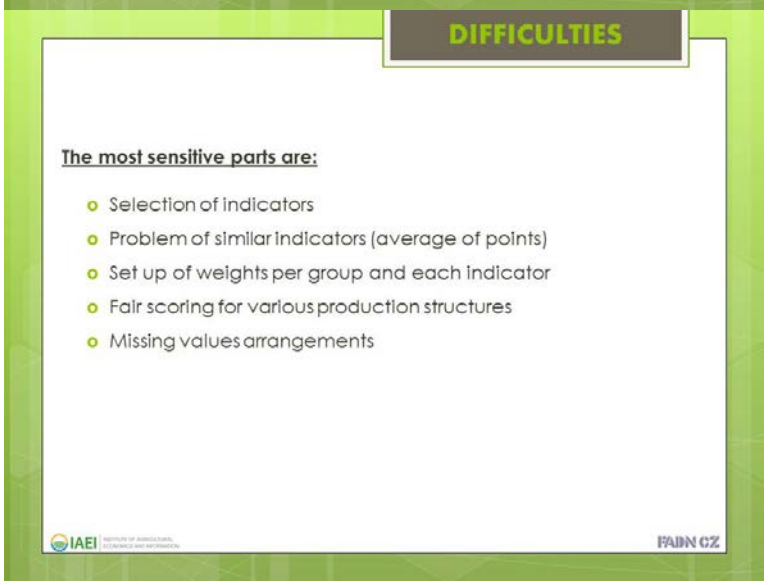

CRITERIA GROUPS
A. Production
B. Economic
E. Other
Multi-criterial evaluation of farm
C. Financial
D. Environmental
IAEI
FADN CZ

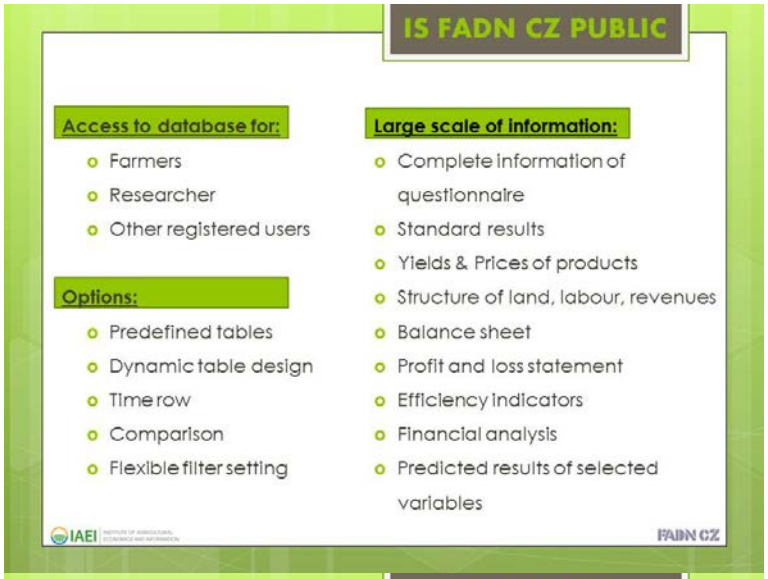

CRITERIA
50 indicators until now:
A. Production:
Crop yield
Weight increase of livestock
Milk yield
Eggs yield
Honey yield
Livestock mortality
B. Economic:
FNVA/AWU
Total production/AWU
Crop production/ha
Livestock production/LU
Specific crop costs/ha
Specific livestock costs/LU
Total intermediate consumption/Total production
Cash flow/total assets
Net investment/Fixed assets
Profit without subsidies/AWU
C. Financial:
16 indicators of
Profitability
Liquidity
Liability
Activity ratios
IAEI
FADN CZ

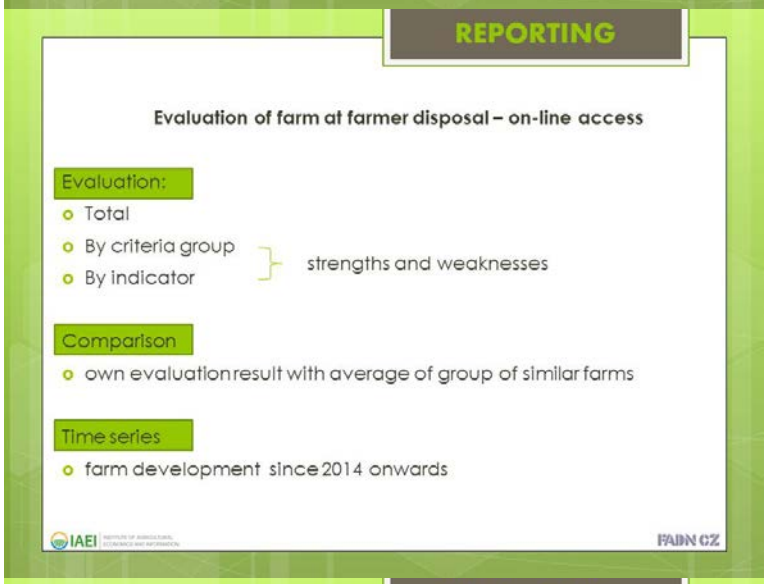

CRITERIA
D. Environmental:
Organic manure/ha arable land
Mineral fertilizers
Crop protection products
Crop rotation
Stocking density
Bio belts
Energy costs/Total production
E. Others:
Gender equal opportunities
Age of farmer
Nb of employees
Education of farmers
Land ownership
Own labour
Production of energy from renewable sources
Protected designation of origin
Protected geographical information
Investment without investment support
Salary
Diversification of production
IAEI
FADN CZ

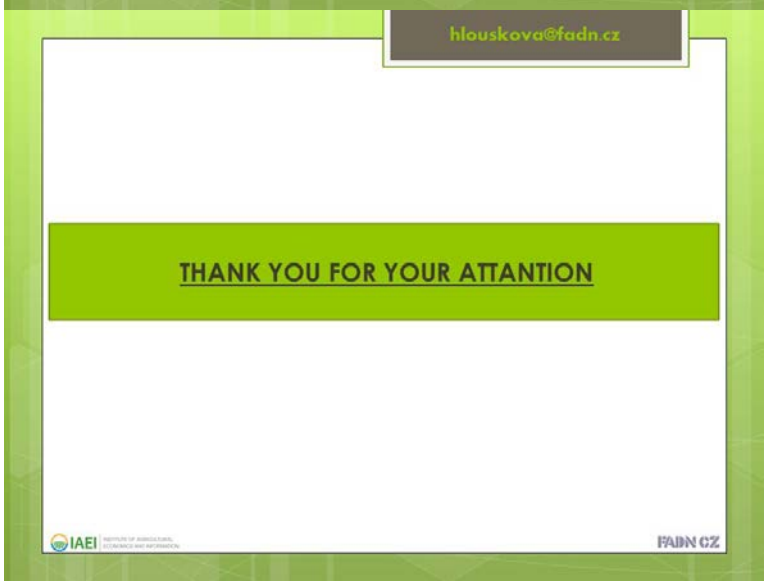

SCORING
Allocation of points based on FADN farm results
Maximum 10 points per indicator
a) Groups B-E
Results of indicator is divided by deciles
Each farm gets number of points according to the position on the scale
b) Group A – yield
Average is calculated
Points according to the distance from the average
Example:
Average yield = 100% = 5 points
Below:
0% = 0 points
20% = 1 point
40% = 2 points
60% = 3 points
80% = 4 points
Above:
120% = 6 points
140% = 7 points
160% = 8 points
180% = 9 points
200% = 10 points
IAEI
FADN CZ


RELEVANCE
A. Production
Weight of group
Weights of indicators
Weighted given points
B. Economic
Weight of group
Weights of indicators
Weighted given points
E. Other
Weight of group
Weights of indicators
Weighted given points
Sum of weighted points
C. Financial
Weight of group
Weights of indicators
Weighted given points
D. Environmental
Weight of group
Weights of indicators
Weighted given points
IAEI
FADN CZ


DIFFICULTIES
The most sensitive parts are:
Selection of indicators
Problem of similar indicators (average of points)
Set up of weights per group and each indicator
Fair scoring for various production structures
Missing values arrangements
IAEI
FADN CZ


IS FADN CZ PUBLIC
Access to database for:
Farmers
Researcher
Other registered users
Options:
Predefined tables
Dynamic table design
Time row
Comparison
Flexible filter setting
Large scale of information:
Complete information of questionnaire
Standard results
Yields & Prices of products
Structure of land, labour, revenues
Balance sheet
Profit and loss statement
Efficiency indicators
Financial analysis
Predicted results of selected variables
IAEI
FADN CZ


REPORTING
Evaluation of farm at farmer disposal – on-line access
Evaluation:
Total
By criteria group
By indicator
strengths and weaknesses
Comparison
own evaluation result with average of group of similar farms
Time series
farm development since 2014 onwards
IAEI
FADN CZ


hlouskova@fadn.cz
THANK YOU FOR YOUR ATTANTION
IAEI
FADN CZ

6.2 A review and improvement of the income determination and forecast system for the Bavarian Agricultural Report

Lucian Stanca

Technische Universität München

Review and improvement of the current system to determine and forecast the income for the Bavarian Agricultural Report

24th Pacioli Conference
September 25th to 28th
Pristina, Kosovo

Lucian Stanca
Technical University of Munich
Agricultural Economics
Agricultural Production and Resource Economics

Technische Universität München

Outline

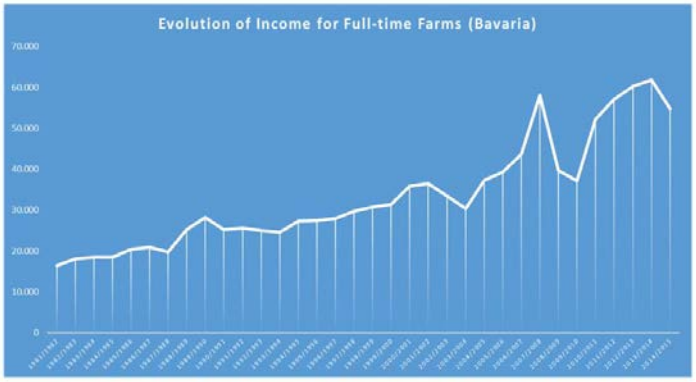
1. Introduction
2. Research questions
3. Current estimation system
4. Methodological approach
5. Next steps
6. Preliminary conclusions

Technische Universität München

1. Introduction

- The Agricultural Act in Germany was adopted in 1955
- Bavarian Agricultural Report was first published in 1973
  - ⇨ A core issue is the presentation of the economic situation of the Bavarian agriculture.
- A weighted estimation was first introduced in 1978
- 33% of farms in Germany are located in Bavaria
- Information is needed at different levels: to better formulate and monitor regional policies, such as funds allocations (Rao & Molina, 2015)

1. Introduction



1. Introduction

- Survey sampling is used for getting information about descriptive population parameters
- Easy and straightforward endeavour in presence of "ideal" statistical conditions
- Ideal conditions are given in absence of non-sampling errors such as:
  - Nonresponse (unit or/and item)
  - Measurement errors
  - Frame imperfection

2. Research questions

- Is the current estimation method still suitable?
- How to improve the current estimation method?
- What are the requirements for a new estimation method?
- Is the estimation significantly different/better when applying the new method?

3. Current estimation system

- Stratified random sampling (more than 3,000 farms)
- Stratification:
  - Farm type :
    - Full-time farms (>50,000 SO, at least one employee)
    - Part-time and Small farmers (25,000-50,000 SO)
  - Farm location
  - Type of farming
  - Farm size (in ha)
- Full-time farms are represented in the sample about 90%; part-time and small farms only about 60%.

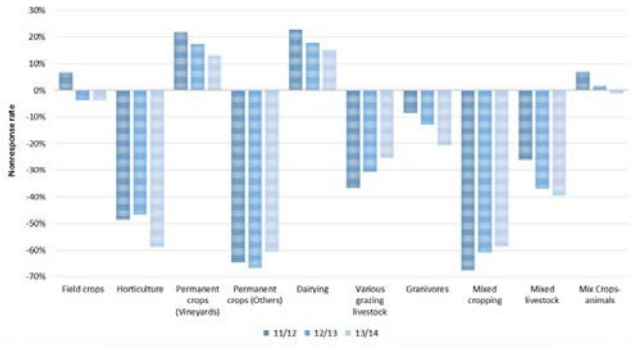
3. Current estimation system

- Two main problems were identified:

1. Unit Nonresponse: part for the sample selected elements does not provide information.
   a. Mayor issue because the parameter is considered biased until the opposite is not confirmed
   b. The variance may increase as well
2. Design effect: standard error is not adjusted for disproportionate sampling or reweighting.

3. Current estimation system

- Nonresponse: according to the BMEL selection plan for 2013/2014 on average 27%



4. Methodological approach

- The information is expanded through the design weights ($d_{ih} = \frac{N_h}{n_h}$), which correspond to the inverse sample inclusion probability, i.e. the proportion of the population each sample unit represents within each strata.
- Estimator for stratified sample is determined as follows:

$$\bar{Y} = \sum_{h=1}^{H} \frac{N_h}{n_h} \sum_{i=1}^{n_h} y_i$$

- Due to nonresponse we can not assure unbiasedness
- Solution: adjust the weights to obtain a nearly unbiased estimation
- How: correlated auxiliary variables

4. Methodological approach

Calibration approach

- Minimise the distance function:

$$\min_{w_i} D(w, d) = \sum_{i=1}^{n} d(w_i, d_i)$$

- Subjected to the calibration function:

$$\sum_{i=1}^{n} w_i x_i = X$$

Why calibration? (Deville and Särndal, 1992; Särndal and Lundström, 2005)

- Reduction of bias when nonresponse
- Improvement of estimates' precision
- Consistent estimation due to different sources

4. Methodological approach

- Disadvantages of the approach:
  - Presence of outliers
  - Weak correlation
  - Imposing to strict restriction on weights might cause no convergence
  - Too large or negative weights

4. Methodological approach

Auxiliary variables

- Integrated Administration and Control System (IACS): consists of a number of computerized and interconnected databases which are used to receive and process aid applications and respective
- Provides:
  - a unique identification system for farmers
  - an identification system covering all agricultural areas called Land Parcel Identification System (LPIS)
  - an identification system for payment entitlements
  - a system for identification and registration of animals

4. Methodological approach

- Särndal and Lundström (2005) suggest, the election of auxiliary variables is to some extent rather based on subjective assessments; nevertheless, it should be based on a structured approach to assure sound decisions.
- The constraints, for instance, that might be worth considering:
  - ✓ The number of farms in the population
  - ✓ The number of farms in the population by farm type
  - ✓ The number of farms in the population by farm size
  - ✓ Area of crop land in Bavaria
  - ✓ Number of dairy cows
  - ✓ Number of beef breed herd
  - ✓ Number of pigs
  - ✓ Number of meat birds

4. Methodological approach

Design effect

- Each strata should be represented proportionally in the sample
- Nevertheless, the composition of farm population is dynamic and so should be its representation in the sample
- But, the sample might not change as population changes
- If $\frac{n_i}{n} \neq \frac{N_i}{N}$, the sample is disproportionate and tends to increase the standard error.

4. Methodological approach

- Reweighting due to nonresponse tends to affect also, even though the impacts are reduced.
- It can assessed through the design effect:

$$deff^2 = 1 + CV^2(w_{hi})$$

- The most common approach employed for complex surveys is the Taylor linearization approach
- Is a design-based method, without any assumptions about the model that generated the data

5. Next steps

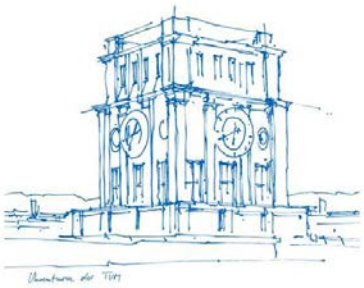
- Choose the most suitable distance function by testing different functions
- Determine the auxiliary variables
- Software for calibration
- Tuning parameters (e.g. convergence and iterations)
- Evaluation of calibrated weights

6. Preliminary conclusions

- It was detected that the current estimation system is only suitable without nonresponse
- When estimating the variance, the design effect must be taken into account
- The weights can be corrected through the calibration approach to produce nearly unbiased estimators
- Software packages for complex surveys include methods for calculating the variance that take design effects into account

Thank you for your attention

Feedback: lucian.stanca@tum.de



6.3 Dutch FADN: income estimations with FES model

Harold van der Meulen

Dutch FADN: income estimations with FES model

Pacioli workshop Pristina - Kosovo

25th - 28th of September 2016

Harold van der Meulen, Wageningen Economic Research

WAGENINGEN UNIVERSITY & RESEARCH

Outline of the presentation

- Introduction
- The FES model
- Using FES for income estimations
- Presentation of the income estimations
- Quality of the income estimations
- Using FES for liquidity position
- Discussion

WAGENINGEN UNIVERSITY & RESEARCH 2

Introduction

- Income estimations at the end of calendar year
- Combination of:
  - Dutch FADN data: sample of 1,500 farms
  - Agricultural census data
  - Market information
- Since a few years the FES model in stead of Excel spreadsheets

WAGENINGEN UNIVERSITY & RESEARCH 3

The FES model

- **F**inancial **E**conomic **S**imulation model
- Based on accounting:
  - Profit and loss account
  - Balance sheet
- Micro-economic simulation model
- FADN-data
- Mid term
- Farm stays the same (size, crops, animals)

WAGENINGEN UNIVERSITY & RESEARCH

4

Using FES for income estimations

- Advantages:
  - More transparent compared to spreadsheets
  - Re-use of factors
  - Broadens applicability of FES-model
  - No separate maintenance for the spreadsheets.
  - Possible to report for non-standard groups.
  - The use of GAMS: very transparent and efficient.
  - The FES model is one of the main models of Wageningen Economic Research:
    - standard working procedures, audits and reviews.
    - maintenance of various versions can easily be organized (subversion).

WAGENINGEN UNIVERSITY & RESEARCH

5

Prognosis of income: input

- Based on profit and loss account individual firms year t-1 (= last year available): calculation on farm-level
  - Revenues: price and quantity factors
    - milk, tomatoes, wheat, potatoes, etc..
  - Costs: price and quantity factors
    - fertilizer, feed, petrol, capital, labour, etc..
  - Exclusion of individual farms possible
- Market information in year t (= recent year)
  - Index on price and quantity of all the revenues and costs from profit and loss account
- No changes in the structure of the firms. However, changes in the relative weighting ratios

WAGENINGEN UNIVERSITY & RESEARCH

6

Prognosis of income: output

- Calculate new revenues and costs in year t
- Forecast of farm income year t
- Data browser access to the results at farm level and sector level
- Report on aggregate level: per agricultural sector
- Report average income estimation and income distribution

WAGENINGEN UNIVERSITY & RESEARCH

7

Income estimations: average and distribution

- Every year great difference in farm income within farm types. See for example dairy farms

WAGENINGEN UNIVERSITY & RESEARCH

Presentation of income estimations

- Prognosis report of income in the Netherlands
  - All FADN data year t-1 available in October
  - Publication on www.agrimatie.nl & www.Agrofoodportal.com
  - Press conference: great interest
  - Important for policymakers

WAGENINGEN UNIVERSITY & RESEARCH

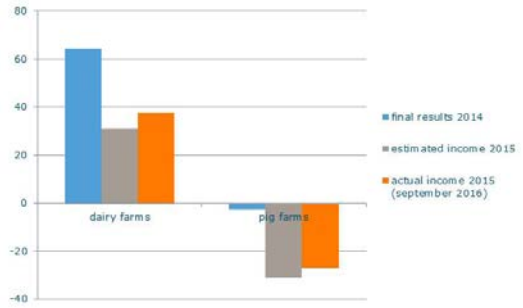
9

www.Agrofoodportal.com

WAGENINGEN UNIVERSITY & RESEARCH 10

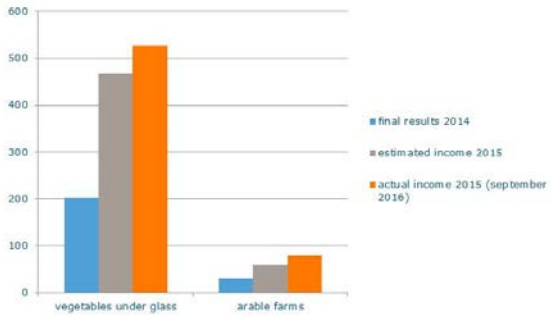
WAGENINGEN UNIVERSITY & RESEARCH 11

Results and quality of the income estimations (from business by farm x 1.000 euro's)



WAGENINGEN UNIVERSITY & RESEARCH 12

Results and quality of the income estimations (from business by farm x 1.000 euro's)

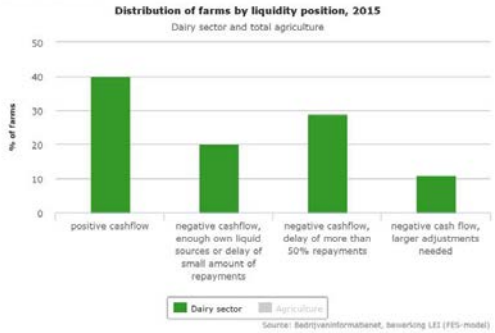


WAGENINGEN UNIVERSITY & RESEARCH

13

Using FES for liquidity distribution

- Cash flow 2015 based on FADN 2014



WAGENINGEN UNIVERSITY & RESEARCH

14

Thank you for your attention

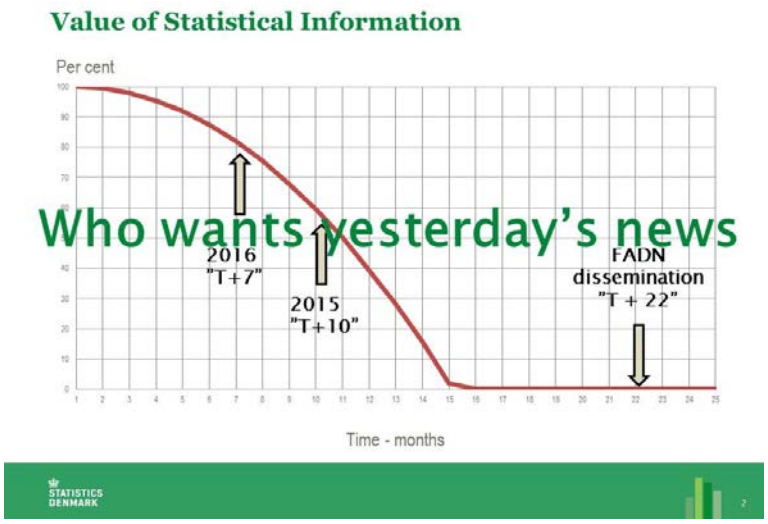
Questions?

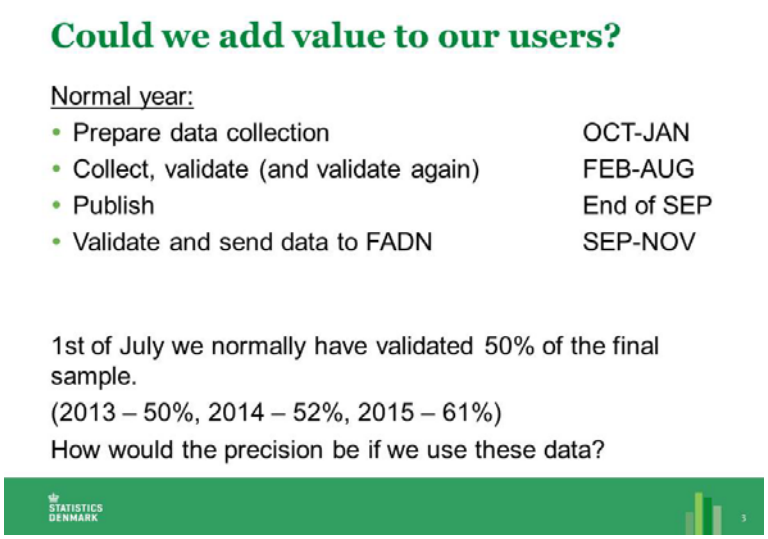
WAGENINGEN UNIVERSITY & RESEARCH

15

6.4 Experience with publication of early farm results in Denmark

Henrik Bolding Pedersen





Results with forecast data for 2013-2015

- **Farm Net Income**, FNI (FADN)

Remuneration to fixed factors (work, land, capital)

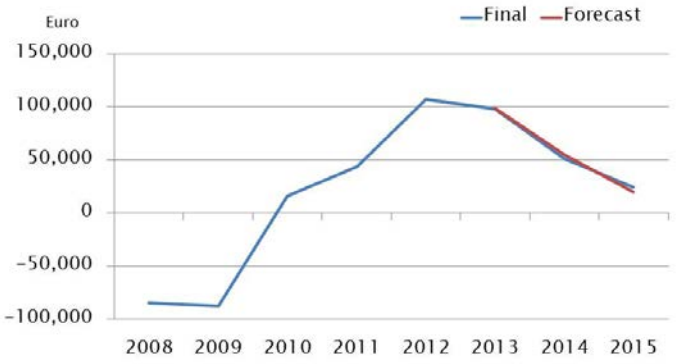
- **Farm Net Profit** (Statistics Denmarks main indicator)

≈ FNI – costs of hired labor and financing

Remuneration to farmer and his invested capital

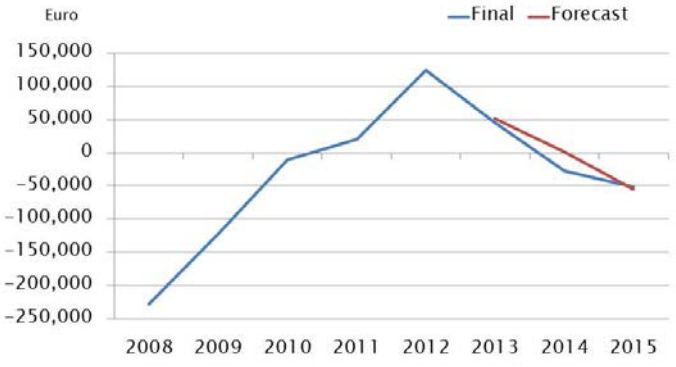
STATISTICS DENMARK 4

Net profit, All Danish full-time farms



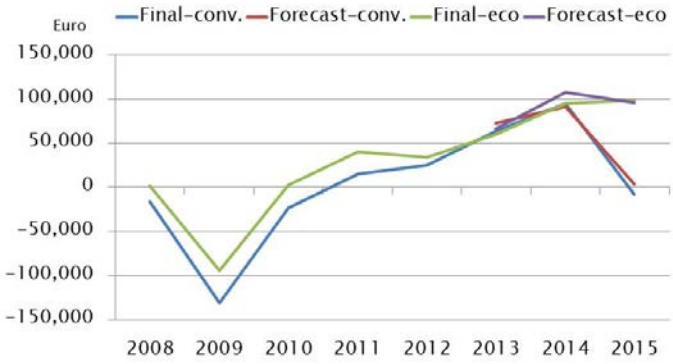
STATISTICS DENMARK 5

Net profit, pig farms



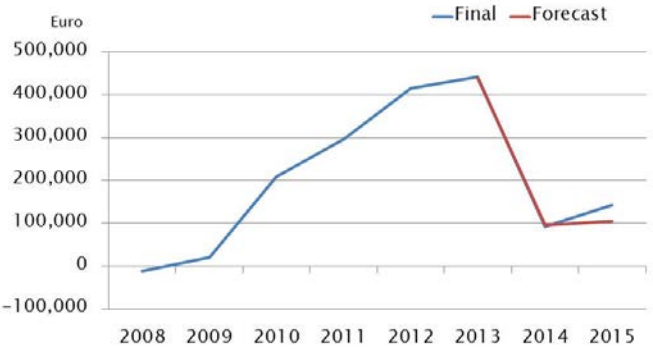
STATISTICS DENMARK 6

Net profit, dairy farms



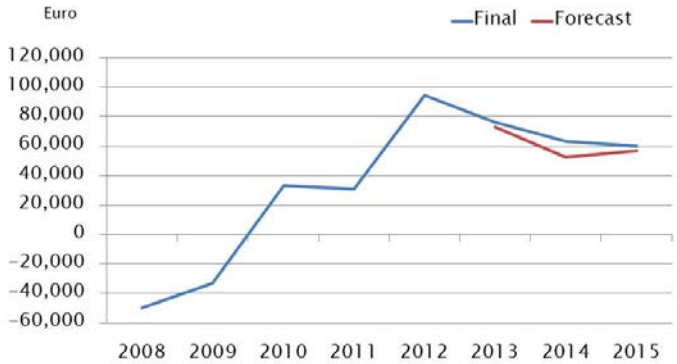
STATISTICS DENMARK

Net profit: Fur farms

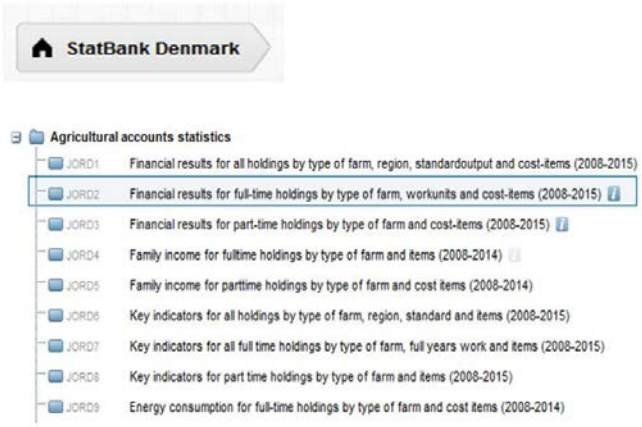


STATISTICS DENMARK

Net profit: Crop farms



STATISTICS DENMARK



STATISTICS DENMARK 10

Did we succeed?

At Statistics Denmark we measure our news on hits and citations in the medias weekly and monthly:

- Week: Nr. 2 on hits and Nr. 1 on citations.
- Month: Most cited News (92 citations) in July.
- Based on 2-3 years experience the precision is OK

STATISTICS DENMARK 11

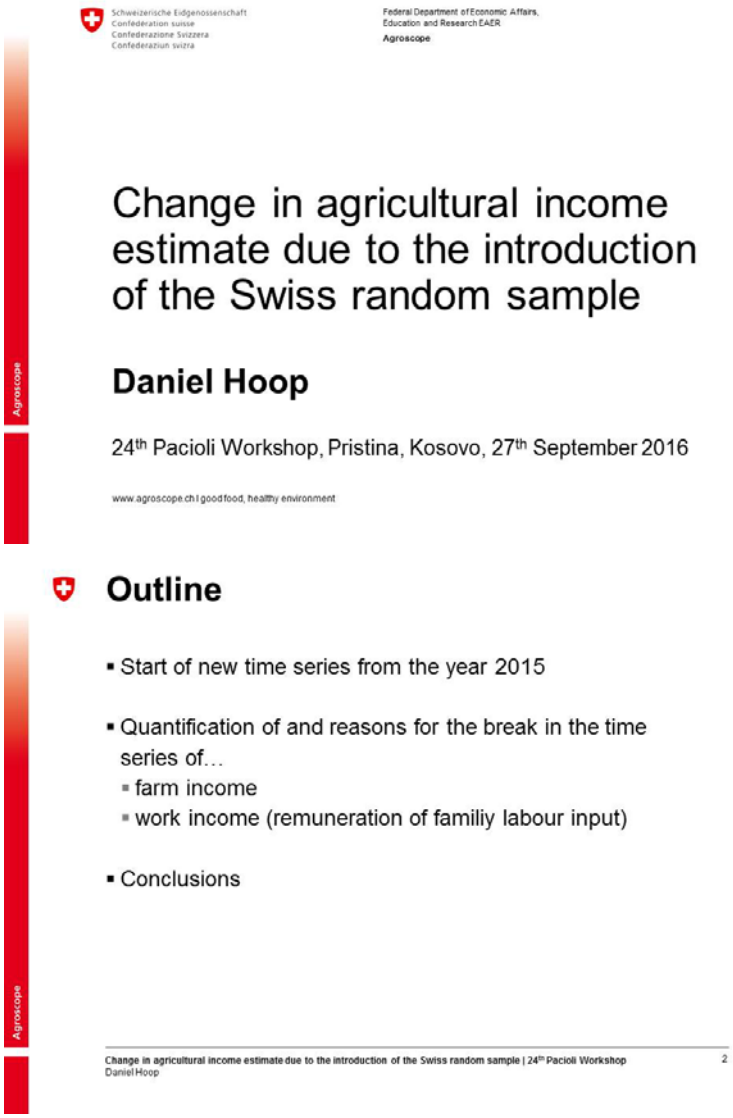
Thank you for your attention!

STATISTICS DENMARK 12

7 Paper session V: Methodological aspects

7.1 Change in agricultural income estimate due to the introduction of the Swiss random sample

Daniel Hoop



NEW TIME SERIES

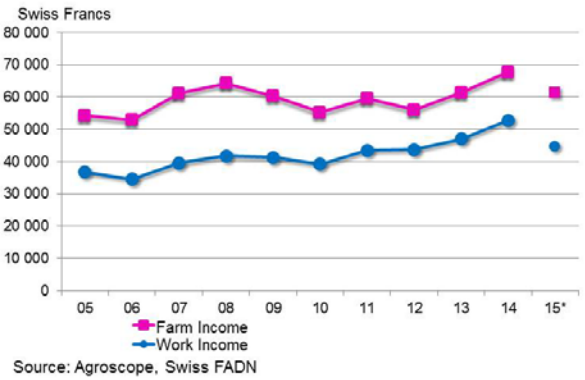
Start of new time series from 2015

- Time seris until 2014 based on the **old system**
- **From 2015** a new time series starts based on the new **random based sample**
- Break in time series: **Shift downwards**
- **Quantification of break** possible based on comparison of agricultural income in old and new system in the year 2014

Two estimates in SpE 2014

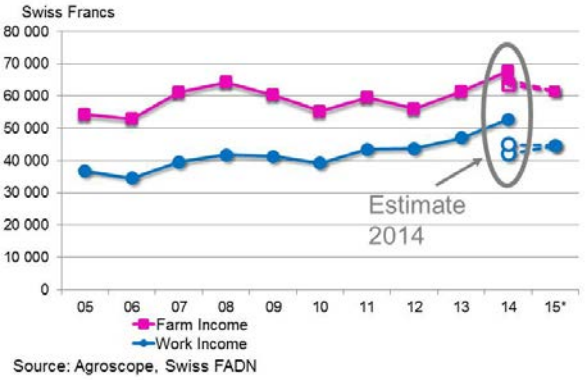
- **Problem!**
  - Sampling plan in 2014 was suboptimal.
    Substantial change in sampling plan from 2014 to 2015
- **Two ways to estimate 2014**
  A: Average of full sample 2014.
  Comparing macroeconomic development with FADN shows: **FADN estimate 2014 seems to be to low! (Should be higher)**
  B: Calculate 2014 based on full sample in 2015 taking into account the relative change of the balanced sample 2014/15.
  → Calculate "backwards" from 2015 to 2014.

Break in time series



Source: Agroscope, Swiss FADN

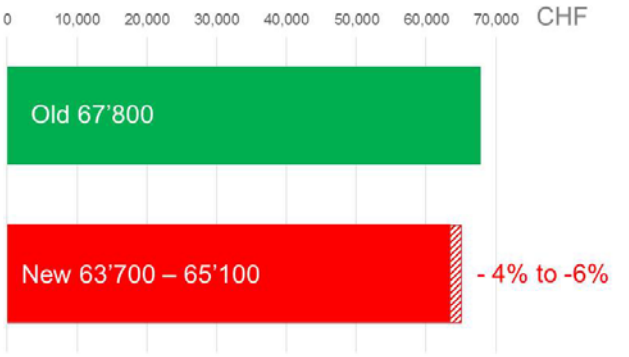
Break in time series



Source: Agroscope, Swiss FADN

QUANTIFICATION OF BREAK IN FARM INCOME

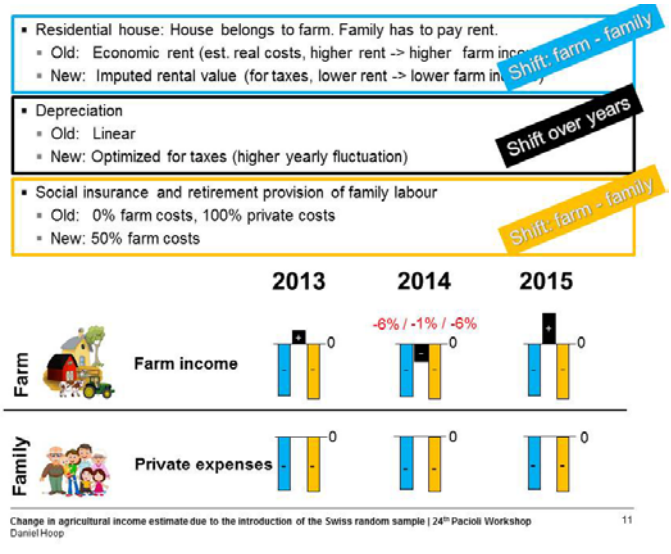
Farm income 2014



Source: RefB/Old FADN system. SpE/Random FADN sample (2 estimates)

Reasons for break in farm income

1. **Methodological changes in accountancies**:
   From analytical accounting to financial accounting (tax optimized)
   Updated calculation of farm income
2. New definition of statistical **population**
3. **Random sample**
4. Other reasons:
   - **New weighting method**: Calibration instead of post stratification
   - New farm **typology**



Definition of the population

- *Old system:* physical minimal sizes, e.g.:
  - 10 ha UAA (usable agricultural area)
  - 6 dairy cows
- *New system:* minimal standard output (95% criteria), e.g. in 2014:

Plain region	Hilly region	Mountains
Fr. 80'000	Fr. 54'600	Fr. 34'800

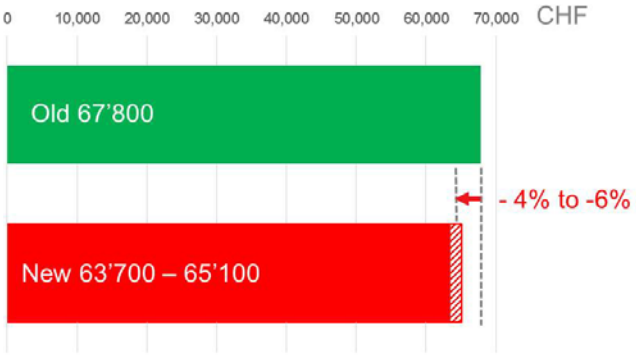
Sample also contains group/collective farms

➢Average farm size increases:

UAA	LU	SGM
+8%	+13%	+14%

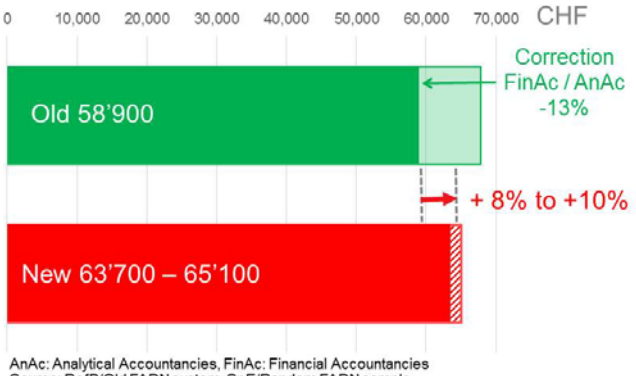
UAA: usable agricultural area, LU: livestock units, SGM: standard gross margin

Farm income 2014



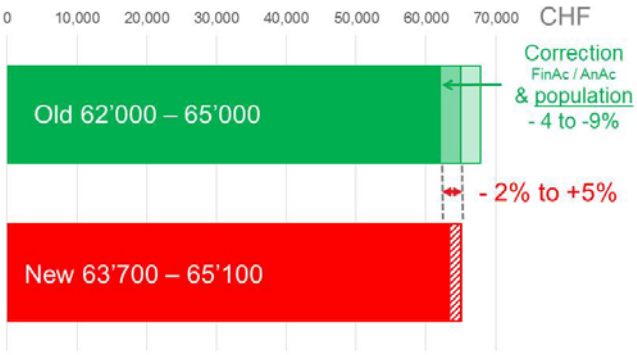
Source: RefB/Old FADN system. SpE/Random FADN sample

Farm income 2014
(Old system adapted to new methodology)



AnAc: Analytical Accountancies, FinAc: Financial Accountancies
Source: RefB/Old FADN system. SpE/Random FADN sample

Farm income 2014
(Old system adapted to new methodology)



Source: RefB/Old FADN system. SpE/Random FADN sample

Remuneration of family labour

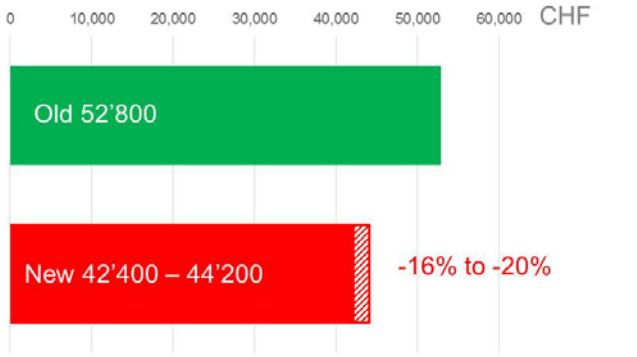
- Calculation of work income (WI) per family annual working unit (FAWU) :

$$WI\ per\ FAWU = \frac{(farm\ income\ - calc.costs\ equity)}{FAWU}$$

- where:

$$calc.costs\ equity = equity * interest\ Swiss\ Conf.\ bonds$$

Work income per family labour unit



Source: RefB/Old FADN system. SpE/Random FADN sample

Reasons for the break in work income per family working unit

	Old	New	Difference
Farm income (CHF)	67'800	63'700 to 65'100	-4% to -6%
- calc.costs eq.(CHF)	-3'600	-3'400 to -3'300	-5% to -8%
= Work income (CHF)	64'200	60'300 to 61'800	-4% to -6%
/ annual working units	1.22	1.42 to 1.40	+15% to +16%
= WI / FAWU (CHF/...)	**52'800**	**42'400 to 44'200**	**-16% to -20%**

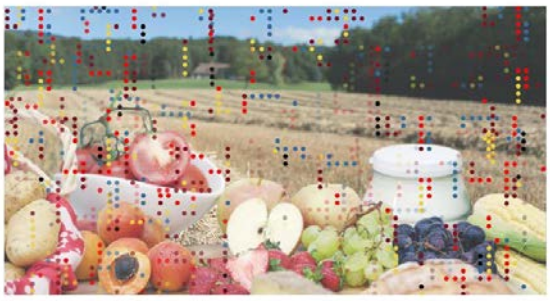
Lower farm income and higher family labour input cause dramatically lower work income per family labour unit.

WI: work income, FLU: family labour unit

Conclusions

- The introduction of the new random based sample led to break in the time series of farm income and work income per family labour unit.
- There are several reasons for the break. An exact quantification of all influencing factors is not possible.
- Despite larger farms in the new sample and the newly defined population, the estimate of farm income and work income decreases by 4 to 6% and 16 to 20%, respectively.
- The introduction of the new sample has shown that work income was massively overestimated with the old FADN system.

Thank you for your attention



Agroscope good food, healthy environment

Literature

Methodik:

- Hoop D., 2016. Harmonisierte Berechnung des landwirtschaftlichen Einkommens und des Arbeitsverdienstes in der Zentralen Auswertung von Buchhaltungsdaten.
- Hoop D., Schmid D., 2016. Betriebstypologie ZA2015 (BT-ZA2015).

www.agrarmonitoring.ch → Stichprobe Einkommenssituation → Methodische Grundlagen

Daten(auswertungen) 2014/2015:

- Hoop D., Jan P., Renner S., Dux D., Schmid D., 2016. Grundlagenbericht 2015.
- Dux D., Schmid D., Jan P., Hoop D., Renner S., 2016. Die wirtschaftliche Entwicklung der schweizerischen Landwirtschaft 2015. Hauptbericht Nr. 39 der Zentralen Auswertung von Buchhaltungsdaten.

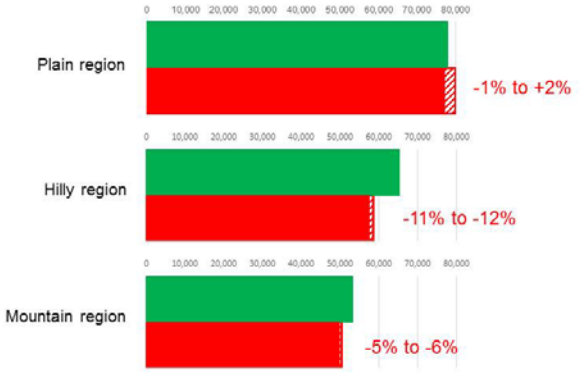
www.grundlagenbericht.ch

Neues Rechnungslegungsrecht:

- AgroTwin AG, 2014. Kontenrahmen KMU-Landwirtschaft –Revision 2013. Bern.

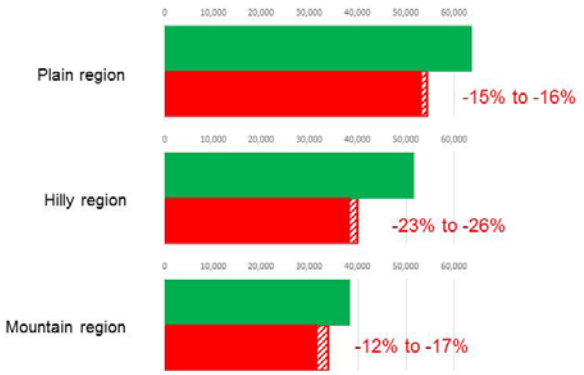
www.agrotwin.ch

Farm income 2014 (distinguished by regions)



(Quelle: RefB/Referenzbetriebe bzw. SpE/Stichprobe Einkommenssituation, Gewichtung: Kalibrierung)

Work income 2014 (distinguished by regions)

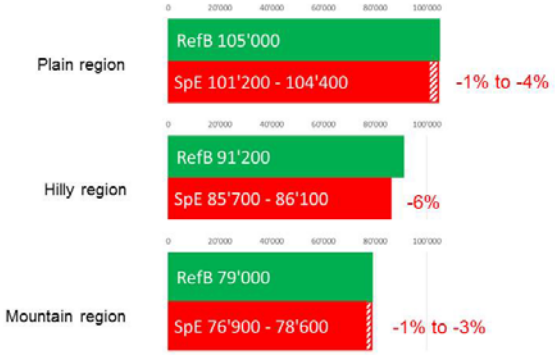


(Quelle: RefB/Referenzbetriebe bzw. SpE/Stichprobe Einkommenssituation, Gewichtung: Kalibrierung)

Household income 2014 (Swiss FADN sample)

RefB –Referenzbetriebe, SpE - Stichprobe Einkommenssituation (nur Einzelbetriebe), Gewichtung: Kalibrierung, Haushalts-/Gesamteinkommen = landwirtschaftliches und ausserlandwirtschaftliches Einkommen

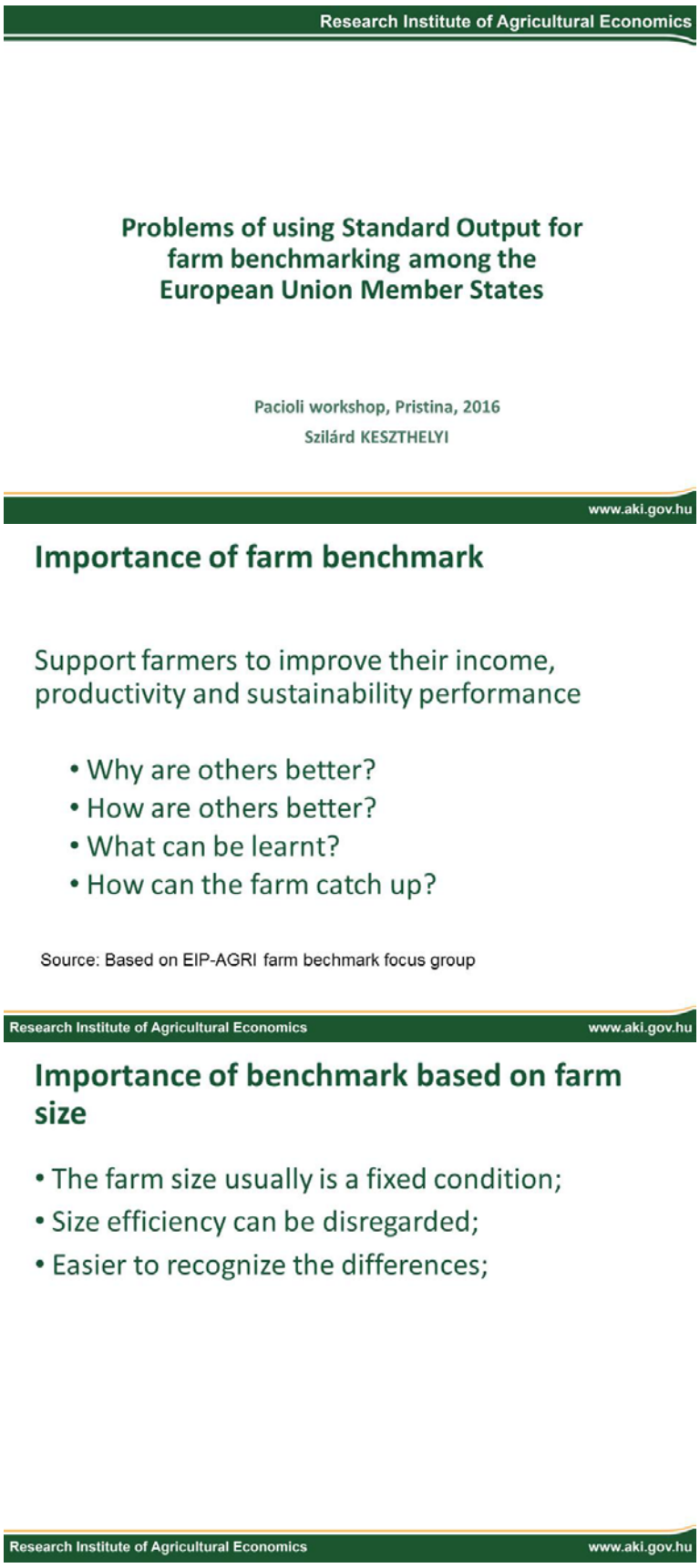
Household income 2014 (distinguished by regions)



RefB –Referenzbetriebe, SpE - Stichprobe Einkommenssituation (nur Einzelbetriebe), Gewichtung: Kalibrierung, Haushalts-/Gesamteinkommen = landwirtschaftliches und ausserlandwirtschaftliches Einkommen

7.2 Problems of using Standard Output for farm benchmarking among EU Member States

Szilard Keszthelyi



TF-8 Fieldcrops, Total Utilised Agricultural Area (SE025)

Country	Economic Size Class (in EUR)					
	2 000 - < 8 000	8 000 - < 25 000	25 000 - < 50 000	50 000 - < 100 000	100 000 - < 500 000	>= 500 000
Bulgaria	7,34	35,29	85,44	184,43	680,18	2087,36
Czech Republic	-	25,73	48,94	93,45	281,94	1353,3
Denmark	-	24,04	41,4	80,43	197,76	597,92
Germany	-	-	37,13	66,81	153,26	842,11
Spain	17,44	37,75	71,92	112,12	168,47	-
Estonia	-	62,71	125,68	247,48	634,44	-
Hungary	12,16	28,35	60,85	113,55	311,66	1423,37
Italy	8,61	12,87	24,84	39,98	70,23	162,87
Latvia	21,91	48,81	86,27	169,07	495,51	-
Malta	-	2,82	5,46	-	-	-
Austria	-	20,76	40,89	71,15	99,54	-
Poland	10,22	18,98	41,74	85,59	240,53	1085,38
Romania	8,1	26,84	85,37	181,29	541,57	2242,13
Finland	-	34,55	77,59	124,11	163,49	-
Slovenia	6,52	13,73	31,26	-	62,43	-
United Kingdom	-	-	59,98	93,41	217,28	675,52
Total	9,27	23	45,6	82,75	184,49	763,02

Source: FADN Public Database

TF8, Milk farms -Total Lifestock Units (SE080)

Country	Economic Size Class (in EUR)					
	2 000 - < 8 000	8 000 - < 25 000	25 000 - < 50 000	50 000 - < 100 000	100 000 - < 500 000	>= 500 000
Bulgaria	6,11	19,11	47,98	81,55	207,79	-
Czech Republic	-	-	28,12	40,49	118,04	705,79
Germany	-	-	21,58	42,44	115,21	592,92
Spain	-	-	21	38,94	110,18	448,51
Estonia	-	7,33	-	41,9	152,87	775,84
Hungary	-	10,21	-	43,83	130,55	971,91
Ireland	-	-	36,44	76,3	159,84	-
Italy	-	10,07	20,77	42,53	118,35	421,34
Lithuania	4,81	12,86	34,01	68,23	165,22	-
Latvia	5,09	11,61	34,56	65,88	155,55	674,91
Netherlands	-	-	-	-	116,58	333,42
Poland	4,26	13,79	29,14	54,89	113,44	-
Romania	4,02	11,98	30,35	65,15	170,65	824,38
Sweden	-	-	18,27	36,32	116,47	424,24
United Kingdom	-	-	-	54,42	177,11	420,34
Total	4,16	12,03	25,75	47,3	121	458,81

Source: FADN Public Database

TF8, Granivores, Total Lifestock Units (SE080)

Country	Economic Size Class (in EUR)					
	2 000 - < 8 000	8 000 - < 25 000	25 000 - < 50 000	50 000 - < 100 000	100 000 - < 500 000	>= 500 000
Belgium	-	-	-	-	287,95	776,54
Bulgaria	-	11,11	32,21	69,91	262,11	2377,76
Czech Republic	-	-	-	-	-	2027,92
Denmark	-	-	-	-	333,5	1147,47
Germany	-	-	-	57,13	219,94	700,66
Spain	-	17,62	27,39	57,13	227,81	892,84
France	-	-	-	65,94	271,89	941,55
Hungary	4,04	15,05	32,5	59,62	185,81	1577,07
Italy	-	5,4	12,24	28,89	118,28	1284,86
Malta	-	-	-	81,21	192,86	-
Netherlands	-	-	-	-	278,93	1001,71
Poland	-	16,39	36,71	73,35	201,13	629,24
Romania	2,96	13,98	-	-	316	1955,41
Sweden	-	-	-	-	301,91	898,17
United Kingdom	-	-	-	-	301,55	1136,22
Total	3,48	17,15	37,07	65,77	227,68	1012,46

Source: FADN Public Database

Walter van Everdingen (LEI) - New indicator: Standard Earning Capacity (Pacioli Dublin)

SO: Need for new indicator

- Compared to SGM, SO is less related to farm value added, farm result and labor input
- Farm size based on SO less comparable then based on SGM
- Many questions on farm labor input and whether a farm is big enough to provide a living for farmer
  - Important in tax and local regulations
  - Before these questions were answered based onSGM, SO not useful

Research Institute of Agricultural Economics www.aki.gov.hu

Problems of EU level farm comparison

1. Standard Output makes bias among the EU member states;
   1. Not express the added value;
   2. Very big differences among the member states
   3. Quality problems;
2. Farms/researchers want to focus on the physical size class (in terms of hectare/livestock);

Research Institute of Agricultural Economics www.aki.gov.hu

Developing new perspectives

Establishment of EU wide SO:

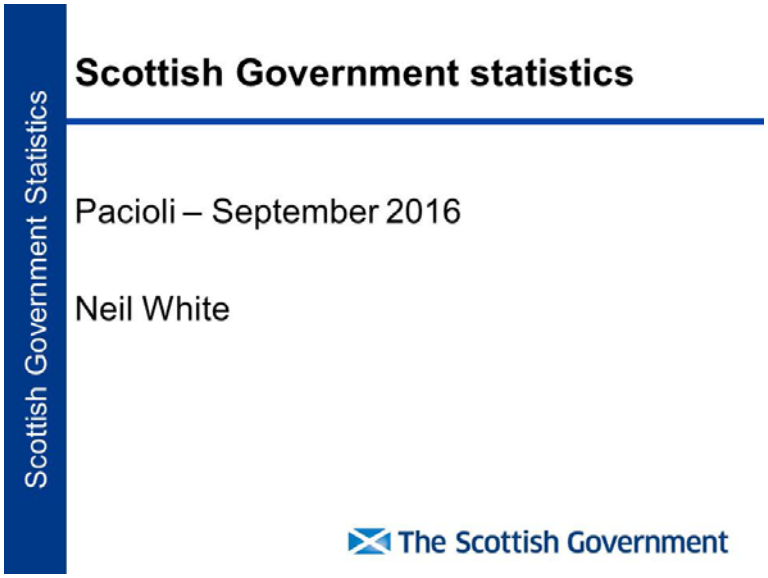
- EU level SOs instead of national -> same physical basis in all countries;
- New Eurostat publication;
- New FADN dataset for international benchmark;
- New on-line typology software for reference information;

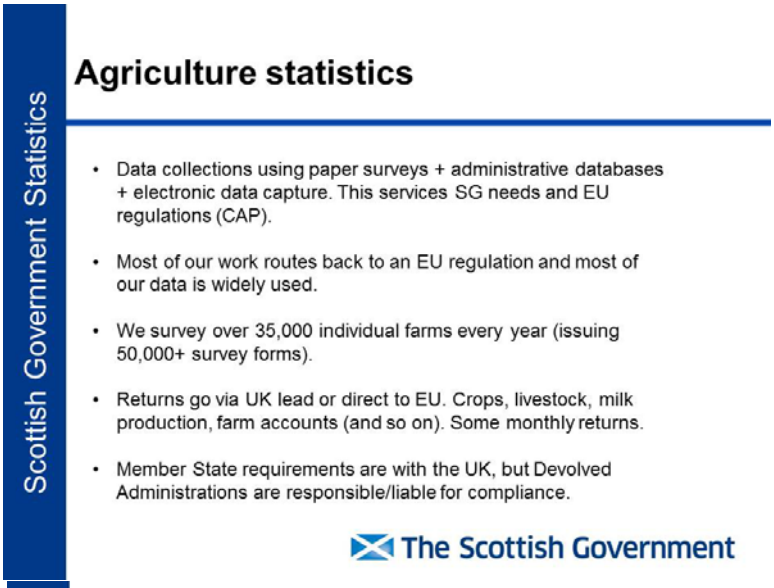
Research Institute of Agricultural Economics www.aki.gov.hu

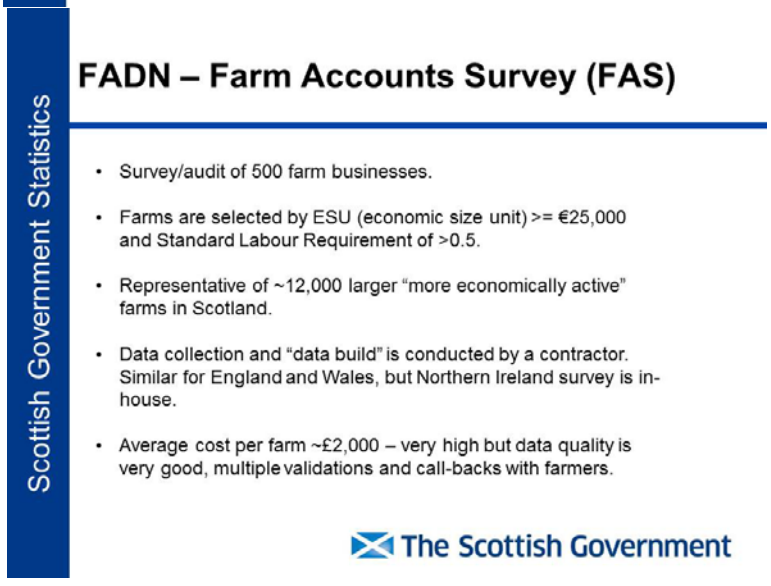
Thank you for your attention!

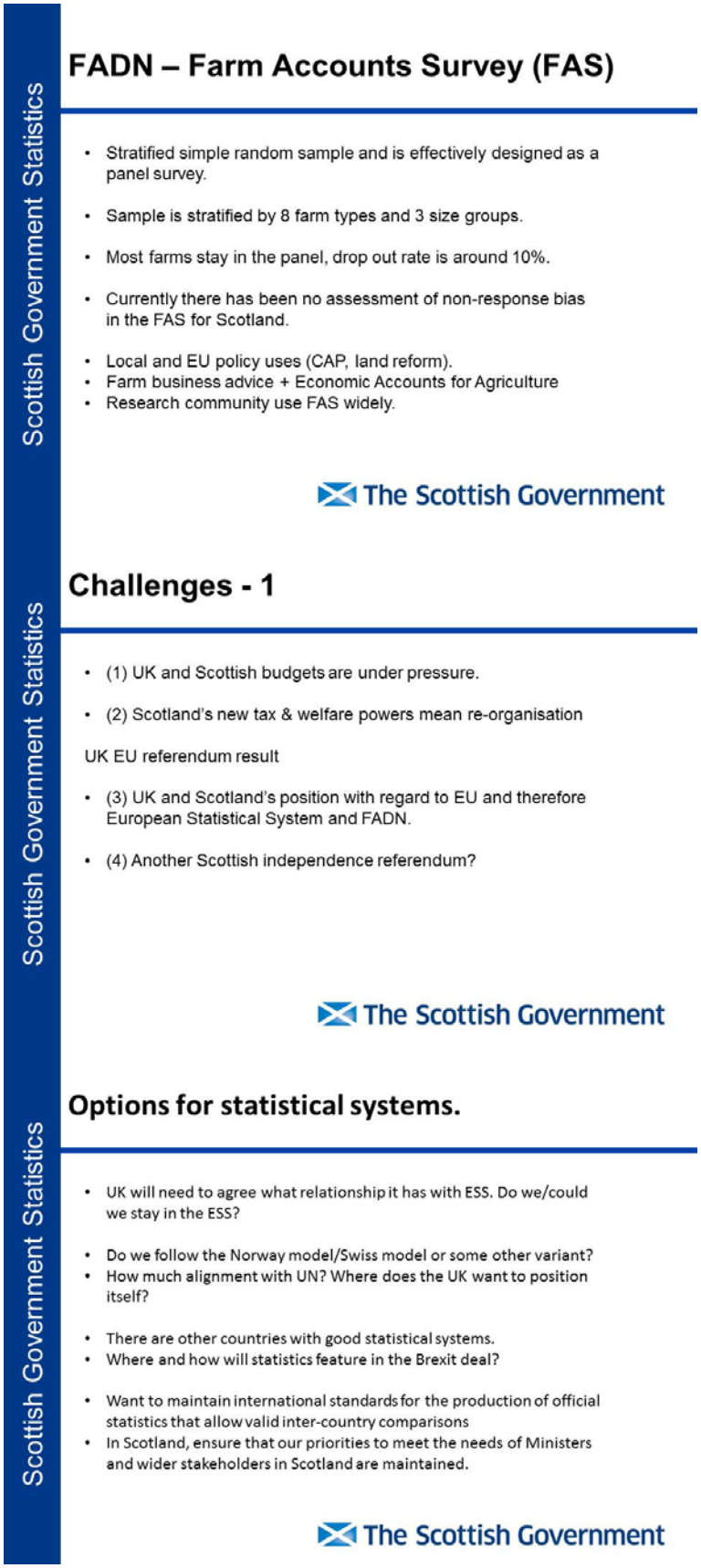
7.3 Design issues in Scottish FADN

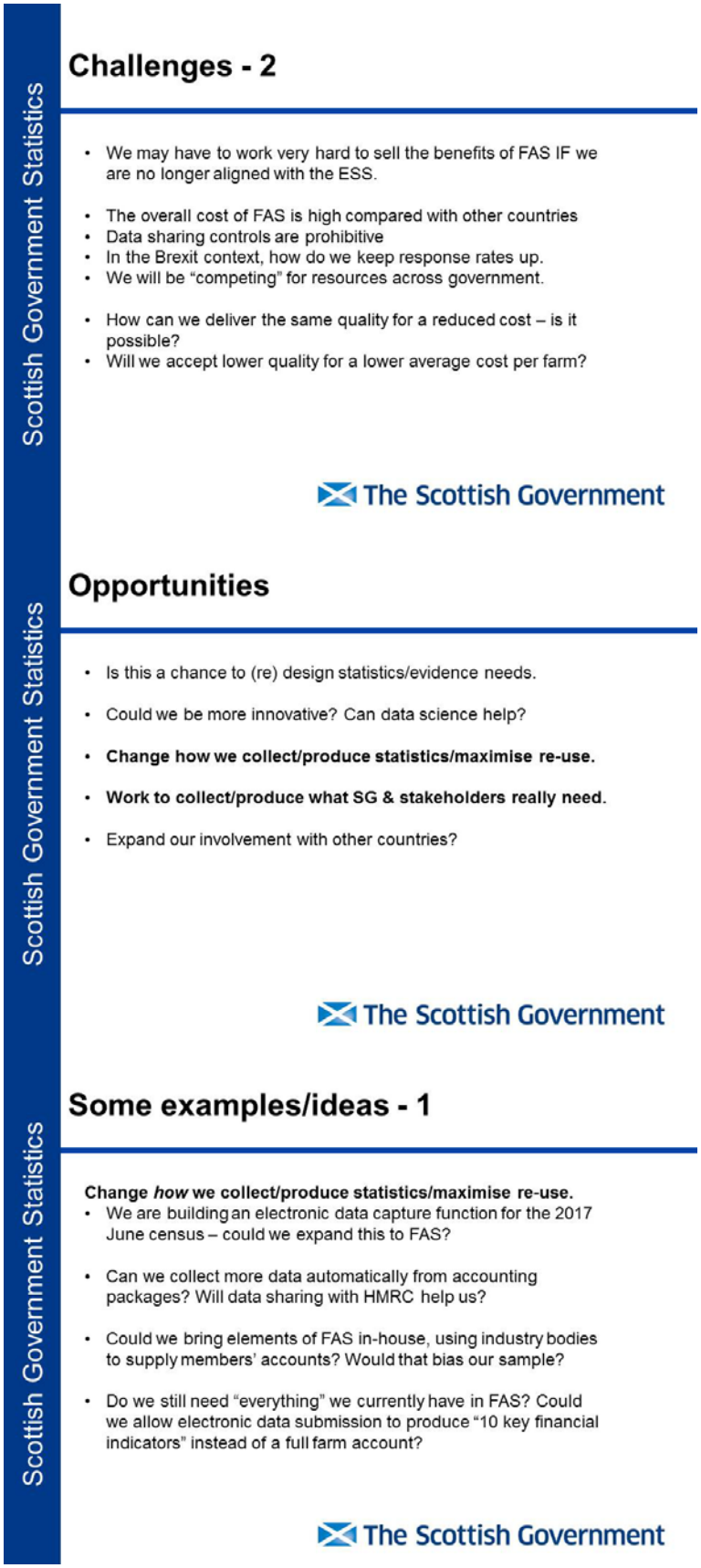
Neil White

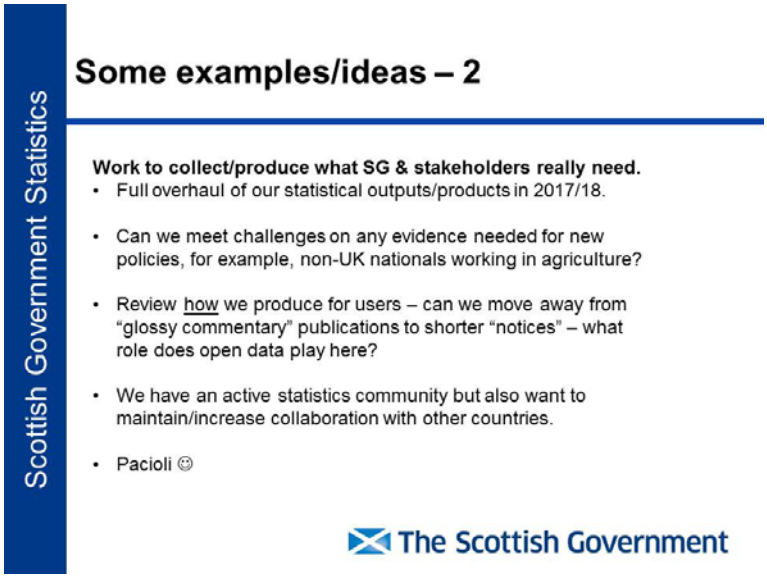







Scottish Government Statistics
FADN – Farm Accounts Survey (FAS)
• Stratified simple random sample and is effectively designed as a panel survey.
• Sample is stratified by 8 farm types and 3 size groups.
• Most farms stay in the panel, drop out rate is around 10%.
• Currently there has been no assessment of non-response bias in the FAS for Scotland.
• Local and EU policy uses (CAP, land reform).
• Farm business advice + Economic Accounts for Agriculture
• Research community use FAS widely.
The Scottish Government
Scottish Government Statistics
Challenges - 1
• (1) UK and Scottish budgets are under pressure.
• (2) Scotland's new tax & welfare powers mean re-organisation
UK EU referendum result
• (3) UK and Scotland's position with regard to EU and therefore European Statistical System and FADN.
• (4) Another Scottish independence referendum?
The Scottish Government
Scottish Government Statistics
Options for statistical systems.
• UK will need to agree what relationship it has with ESS. Do we/could we stay in the ESS?
• Do we follow the Norway model/Swiss model or some other variant?
• How much alignment with UN? Where does the UK want to position itself?
• There are other countries with good statistical systems.
• Where and how will statistics feature in the Brexit deal?
• Want to maintain international standards for the production of official statistics that allow valid inter-country comparisons
• In Scotland, ensure that our priorities to meet the needs of Ministers and wider stakeholders in Scotland are maintained.
The Scottish Government

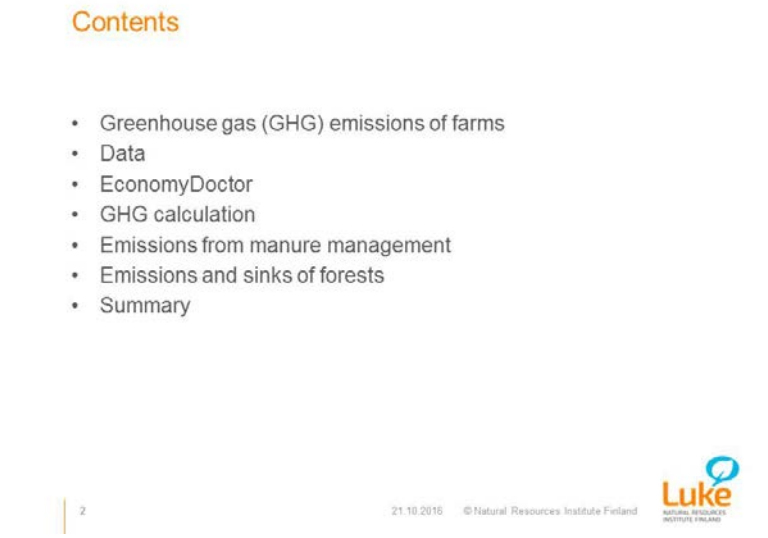

Scottish Government Statistics
Challenges - 2
We may have to work very hard to sell the benefits of FAS IF we are no longer aligned with the ESS.
The overall cost of FAS is high compared with other countries
Data sharing controls are prohibitive
In the Brexit context, how do we keep response rates up.
We will be "competing" for resources across government.
How can we deliver the same quality for a reduced cost – is it possible?
Will we accept lower quality for a lower average cost per farm?
The Scottish Government
Scottish Government Statistics
Opportunities
Is this a chance to (re) design statistics/evidence needs.
Could we be more innovative? Can data science help?
Change how we collect/produce statistics/maximise re-use.
Work to collect/produce what SG & stakeholders really need.
Expand our involvement with other countries?
The Scottish Government
Scottish Government Statistics
Some examples/ideas - 1
Change how we collect/produce statistics/maximise re-use.
We are building an electronic data capture function for the 2017 June census – could we expand this to FAS?
Can we collect more data automatically from accounting packages? Will data sharing with HMRC help us?
Could we bring elements of FAS in-house, using industry bodies to supply members' accounts? Would that bias our sample?
Do we still need "everything" we currently have in FAS? Could we allow electronic data submission to produce "10 key financial indicators" instead of a full farm account?
The Scottish Government


Scottish Government Statistics
Some examples/ideas – 2
Work to collect/produce what SG & stakeholders really need.
• Full overhaul of our statistical outputs/products in 2017/18.
• Can we meet challenges on any evidence needed for new policies, for example, non-UK nationals working in agriculture?
• Review how we produce for users – can we move away from "glossy commentary" publications to shorter "notices" – what role does open data play here?
• We have an active statistics community but also want to maintain/increase collaboration with other countries.
• Pacioli ☺
The Scottish Government

8 Paper session VI: Data exchange and delivery

8.1 Greenhouse gas emissions in Economy Doctor

Mika Sulkava



Greenhouse gas (GHG) emissions of farms

- Agricultural GHG emissions 20 % of Finland's total emissions
- Until now, no farm-level emissions available
- New web service in construction to EconomyDoctor
- Emission categories to be calculated
  - CH_4 emissions from animals and manure
  - N_2O emissions from soil and manure
  - CO_2 emissions from liming
  - CO_2 emissions and sinks from biomass and soil
  - CO_2 emissions from energy use

Data

- Farm-level data currently available
  - Number of animals
  - Crop output
  - Area of organic and inorganic soil
  - Amount of fuels used
- Data to be collected
  - Cutting down trees
  - Manure management
  - Synthetic fertilizers

EconomyDoctor

- Web service providing lots of information about Finnish agriculture and horticulture
- Also other forms of primary production: e.g., fishing, reindeer farming and beekeeping

GHG calculation

- Calculations in EconomyDoctor are done on the fly in SAS
- New SAS routines for GHG emissions will be implemented according to IPCC 2006 guidelines
- Forest growth calculated in NettiMELA – another web service of Luke
- Emissions of enteric fermentation ready
- SAS routines ready for emissions of manure management
- Other emission components under construction

GHG calculation

MTT TALOUSTOHTORI® www.mtt.fi/taloustohtori

Taloustohtori. Kasvihuonekaasulaskenta-palvelu (luke.fi/taloustohtori). Aineisto: kasvihuonekaasulaskenta-aineisto. 14.12.2015

Kasvihuonekaasut ruuansulatus naudat	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
CH4 emissions for dairy cows	44,87	44,70	44,93	45,57	45,12	44,64	45,59	46,83	47,61	48,30	48,90	50,10	50,25	50,75
CH4 emissions for suckler cows	6,20	6,27	6,33	6,09	5,57	5,17	4,59	4,11	3,63	3,26	2,92	2,91	2,80	2,85
CH4 emissions for bulls (over 1 year)	8,39	8,33	8,61	8,93	8,40	8,29	8,36	8,40	7,96	8,17	8,37	8,13	7,58	7,65
CH4 emissions for heifers	8,65	8,60	8,79	8,89	8,69	8,75	8,78	8,89	8,71	8,93	9,08	9,01	8,93	8,95
CH4 emissions for calves (under 1 year)	11,17	11,32	11,25	11,40	11,22	11,14	11,29	11,32	11,59	11,63	11,89	12,02	12,06	11,94
CH4 emissions for dairy cattle	44,87	44,70	44,93	45,57	45,12	44,64	45,59	46,83	47,61	48,30	48,90	50,10	50,25	50,75
CH4 emissions for non-dairy cattle	34,42	34,51	34,99	35,31	33,88	33,35	33,02	32,73	31,89	31,99	32,25	32,06	31,36	31,39
Total emissions for cattle	**79,29**	**79,21**	**79,91**	**80,88**	**79,00**	**77,98**	**78,60**	**79,55**	**79,49**	**80,29**	**81,15**	**82,17**	**81,61**	**82,14**

Palvelun tuottaa: Suomen Luonnonvarakeskus, Luke | www.luke.fi

GHG calculation

Luke ECONOMYDOCTOR

Economydoctor. Greenhouse Gas calculation -service (luke.fi/economydoctor). Data: Luke Profitability bookkeeping results. April 17, 2016

CH4 emissions of cattle	Dairy Farms														
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Farms represented	19 500	17 900	16 900	16 300	15 300	14 400	13 400	12 100	11 200	10 700	10 100	9 480	8 940	8 460	8 040
Farms in sample	360<=x<380	320<=x<330	320<=x<330	320<=x<330	340<=x<360	370<=x<380	360<=x<370	360<=x<370	360<=x<370	350<=x<360	350<=x<360	330<=x<340	320<=x<330	310<=x<320	300<=x<310
Arable land	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Livestock Units	27,7	29,2	30,3	30,7	31,8	35,9	41,4	47,4	49,2	51,3	44,9	51,4	56,9	65,7	61,4
CH4_dairy_cows	2,8	3,0	3,1	3,2	3,5	3,8	4,7	5,3	5,6	5,9	6,5	6,9	6,9	7,1	6,5
CH4_suckler_cows	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
CH4_bulls	0,1	0,1	0,1	0,1	0,1	0,1	0,2	0,2	0,2	0,1	0,2	0,2	0,1	0,1	0,0
CH4_heifers	0,4	0,5	0,5	0,5	0,6	0,6	0,7	0,8	0,9	0,9	1,0	1,1	1,0	1,1	0,8
CH4_calves	0,4	0,4	0,4	0,4	0,5	0,5	0,6	0,7	0,7	0,7	0,9	0,9	0,8	0,8	0,7
Dairy_CH4	2,8	3,0	3,1	3,2	3,5	3,8	4,7	5,3	5,6	5,9	6,5	6,9	6,9	7,1	6,5
Non_dairy_CH4	1,0	1,0	1,0	1,1	1,1	1,2	1,5	1,7	1,8	1,8	2,0	2,1	2,0	1,9	1,5
Total_cattle_CH4	3,7	4,0	4,1	4,3	4,7	5,0	6,3	7,1	7,4	7,7	8,5	9,0	8,9	9,0	8,0

Service Production: © Natural Resources Institute Finland | www.luke.fi

GHG calculation

MTT TALOUSTOHTORI® www.mtt.fi/taloustohtori

Taloustohtori. Kasvihuonekaasulaskenta-palvelu (luke.fi/taloustohtori). Aineisto: kasvihuonekaasulaskenta-aineisto. 14.12.2015

Kasvihuonekaasut ruuansulatus muut eläimet	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
CH4 emissions for sheep	1,14	1,09	1,08	1,05	0,99	1,03	1,00	0,98	0,74	0,81	0,72	0,70	0,68	0,71
CH4 emissions for swine	1,31	1,30	1,34	1,39	1,40	1,49	1,50	1,42	1,42	1,38	1,37	1,30	1,25	1,33
CH4 emissions for sows	0,45	0,47	0,50	0,53	0,53	0,59	0,61	0,60	0,62	0,60	0,61	0,59	0,55	0,63
CH4 emissions for piglets	0,05	0,05	0,05	0,05	0,05	0,06	0,06	0,06	0,06	0,06	0,06	0,05	0,05	0,05
CH4 emissions for fattening pigs	0,60	0,58	0,58	0,60	0,60	0,61	0,60	0,54	0,54	0,52	0,51	0,46	0,45	0,45
CH4 emissions for boars	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,02	0,02	0,02	0,02	0,02
CH4 emissions for weaned pigs	0,20	0,19	0,20	0,20	0,21	0,22	0,21	0,20	0,19	0,18	0,18	0,18	0,18	0,18
CH4 emissions for goats	0,02	0,02	0,02	0,02	0,03	0,03	0,03	0,03	0,03	0,04	0,03	0,03	0,04	0,04
CH4 emissions for horses	1,16	1,17	1,18	1,16	1,13	1,09	1,07	1,04	1,01	0,97	0,95	0,94	0,93	0,91
CH4 emissions for ponies	0,19	0,19	0,18	0,17	0,17	0,16	0,15	0,14	0,14	0,13	0,13	0,13	0,12	0,12
CH4 emissions for horses and ponies	1,35	1,36	1,36	1,34	1,30	1,25	1,22	1,19	1,15	1,10	1,08	1,06	1,05	1,03
CH4 emissions for poultry	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
CH4 emissions for reindeer	3,81	3,82	3,91	3,85	3,84	3,89	3,85	3,94	4,12	4,00	3,91	3,97	3,70	4,05
CH4 emissions for minks and fitches	0,14	0,14	0,11	0,16	0,13	0,13	0,18	0,14	0,15	0,14	0,14	0,14	0,14	0,15
CH4 emissions for foxes and racoons	0,20	0,20	0,18	0,19	0,21	0,14	0,17	0,20	0,23	0,22	0,22	0,20	0,15	0,19
CH4 emissions for fur animals	0,34	0,34	0,29	0,35	0,34	0,27	0,35	0,34	0,38	0,35	0,36	0,34	0,29	0,34
Total emissions for other livestock	**7,97**	**7,93**	**8,01**	**8,00**	**7,90**	**7,95**	**7,95**	**7,90**	**7,84**	**7,67**	**7,48**	**7,42**	**7,01**	**7,49**

Palvelun tuottaa: Suomen Luonnonvarakeskus, Luke | www.luke.fi

GHG calculation

Luke ECONOMYDOCTOR

Economydoctor. Greenhouse Gas calculation -service (luke.fi/economydoctor). Data: Luke Profitability bookkeeping results. April 18, 2016

CH4 emissions of other livestock	Pig farms													
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Farms represented	2 970	2 710	2 620	2 610	2 380	2 230	1 930	1 830	1 640	1 430	1 330	1 210	1 080	980
Farms in sample	80<=n<90	70<=n<80	70<=n<80	80<=n<90	70<=n<80	70<=n<80	60<=n<70	60<=n<70	60<=n<70	50<=n<60	50<=n<60	40<=n<50	40<=n<50	40<=n<50
Arable land	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Livestock Units	90.1	97.2	97.9	108.5	113.2	129.2	133.6	141.5	164.1	176.3	178.0	182.2	181.3	220.5
Sheep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Swine	0.18	0.20	0.19	0.18	0.24	0.31	0.30	0.32	0.31	0.32	0.36	0.31	0.37	0.43
Sows	0.02	0.02	0.02	0.02	0.03	0.04	0.04	0.04	0.05	0.05	0.06	0.08	0.09	0.08
Piglets	0.34	0.29	0.38	0.60	0.36	0.37	0.43	0.50	0.57	0.60	0.90	0.63	0.97	0.82
Fattening pigs	0.04	0.09	0.10	0.09	0.13	0.11	0.12	0.14	0.23	0.38	0.22	0.22	0.10	0.13
Boars	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Weaned pigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Goats	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Horses	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Service Production: © Natural Resources Institute Finland | www.luke.fi

GHG calculation

nomydoctor. Greenhouse Gas calculation -service (luke.fi/economydoctor). Data: Luke Profitability bookkeeping results. September 21, 2016

Greenhouse gas N2O from manures at housings	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	2001	2000
Farms represented	37 100	37 900	38 900	40 200	42 900	43 100	43 300	44 500	45 700	43 300	44 700	45 500	48 800	50 300	53 300
Farms in sample	830<=n<840	840<=n<850	850<=n<860	890<=n<900	920<=n<930	945<=n<950	945<=n<950	955<=n<960	925<=n<930	885<=n<890	845<=n<850	815<=n<820	790<=n<800	800<=n<810	845<=n<850
Arable land	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Livestock Units	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dairy cows	0.4228	0.4145	0.4191	0.4045	0.4242	0.4174	0.4326	0.443	0.4602	0.4659	0.4742	0.4664	0.4564	0.4444	0.4269
Suckler	0.2155	0.196	0.2006	0.1889	0.1744	0.1634	0.1856	0.1595	0.1249	0.1201	0.1112	0.0887	0.0762	0.0708	0.0615
Bulls	0.0299	0.0307	0.0305	0.0212	0.0152	0.0078	0.0048	0.0023	0.0005	0	0	0	0	0	0
Heifers	0.1936	0.1848	0.1944	0.1924	0.2093	0.2078	0.2233	0.2445	0.2396	0.2499	0.2494	0.2304	0.2215	0.2051	0.197
Calves	0.1244	0.161	0.1335	0.1245	0.1146	0.0932	0.0921	0.0849	0.0756	0.0765	0.069	0.0787	0.0702	0.0719	0.0633

Emissions from manure management

- Manure management is the third largest GHG emission component of agriculture
- Emissions both CH_4 and N_2O
  - Much stronger than CO_2
- No accurate information about manure management in farms
  - > Inaccurate total emissions without additional information about manure management

12 21.10.2016 © Natural Resources Institute Finland

Emissions from manure management

- New data collection form

Stallgödselsystem 2015

Anteckna under rubriken Gödselsystemet av djurgrupp antalet djur (i genomsnitt) som är i gödselsystemet i fråga.
Under Flytgödsel kryssa rutan Tak, om flytgödselbehållaren har fast tak. Kryssa rutan Täckning om det uppstår skorpa på ytan av flytgödsel eller det används flytande täckning.
Definition av ströbädd: utströningsmellanrum är längre än en månad, urinen uppsugs i strö.
Anteckna under rubriken Betande antalet betesdagar och antalet dagar då djuren är på bete dygnet runt.
Kryssa rutan Rastgård om djuren kan gå ut på tåla/hage utanför betessäsongen. Kryssa rutan Kall lösdriftsstall om djuren hålls i ett oisolerat kallt djurstall.

Djurslag/grupp	Gödselsystemet av djurgrupp					Betande av djur			
	Flytgödsel			Strögödsel (urin avskild)	Ströbädd	antal betesdagar	av vilka dygnet runt		
	djur. st	Tak [X]	Täckning [X]	djur. st	djur. st	betesdagar	betesdagar	Rastgård [X]	Kall lösdriftsstall [X]
Nötkreatur:									
Dikor									
Mjölkkor									
Tjurar, över 2 år									
Tjurar, 1–2 år									
Kvigor, över 2 år, till slakt									
Kvigor, över 2 år, rekrytering									
Kvigor, 1–2 år									
Kalvar, under 1 år									
Svin:									
Galtar									
Suggor, över 8 mån.									
Övriga svin, över 2 mån.									
Slaktsvin, över 2 mån.									
Grisar, under 2 mån.									
Fjäderfä:									
Värphöns									
Kycklingar									
Broiler									
Kalkoner									
Övriga fjäderfän									
Getter och får:									
Hongetter									
Övriga getter									
Tackor									
Övriga får									
Hästar:									
Finska hästar									
Varmblodshästar									
FÖL under 1 år									

13

Emissions and sinks of forests

- Forest growth sequestrates large amounts of carbon from atmosphere
- Cutting down the trees results in major loss of carbon stock
- We asked if the FADN farmers are willing to give permission to use their forest plan information
  - Only few interested farms turned up
  - Enough for prototyping, but not for reliable calculations

14 21.10.2016 © Natural Resources Institute Finland

Summary

- Farms produce a significant amount of greenhouse gases
- Farm-level GHG calculations will be available in EconomyDoctor
- Links between economic performance and GHG emissions
- Manure management is an important source of emissions
- New data collection form
- Forests also important
- Data acquisition requires resources
- Better calculation accuracy in future

Luke
NATURAL RESOURCES
INSTITUTE FINLAND

8.2 User Friendly FBS data delivery

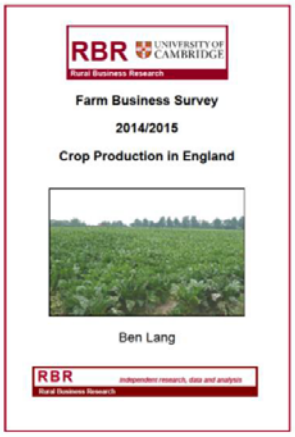
Ben Lang

RBR Enterprise Reports

Eight reports in combinations of print format and web version at ruralbusinessresearch.co.uk

These cover arable, horticulture and several livestock farm types.

One is a specialist organic report.



Selected Regional Results

The results that we are presenting today can be found at:

www.farmbusinesssurvey.co.uk

Report concepts

We have designed the reports with the following concepts in mind. The repots should:

- Be useful to many users; farmers to policy professionals
- Be consistent with published Defra data
- Be responsive to user feedback
- Take account of users' varying numeracy
- Offer a range of data presentation methods (e.g. graphs and words) as appropriate

RBR Rural Business Research

www.farmbusinesssurvey.co.uk

Four reports to meet the requirements of a wide range of users:

- Simple indexing vs relevant data
- A large dataset vs 'drill down' capability
- Confidentiality of data vs maximum access
- Changing policy demands vs consistency
- Accuracy vs timeliness of data

RBR Rural Business Research

Region Reports

Since 2004 /2005:
- farm profitability,
- balance sheets
- time series performance

FBI calculation splits: of:
- agriculture
- agri environment
- single payment
- diversification

RBR Rural Business Research

Website Tools: Farm Benchmarking

www.farmbusinesssurvey.co.uk/benchmarking

→Enterprise gross margins

→Farm Profitability

→Performance ratios

→Balance Sheets

→EU benchmarking

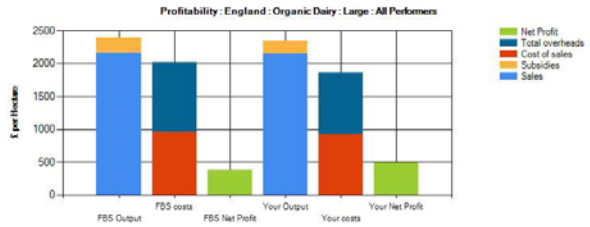
1) Sector Specific
2) Average and Top Quartile Data
3) Includes some Organic

RBR
Rural Business Research

FBS farm business benchmarking

Farm and gross margin comparisons by:

- organic and conventional
- farm size
- tenure
- farm performance



RBR
Rural Business Research

Projection Calculator

Projection calculator uses accurate Farm Business Data and the latest futures prices to indicate future gross margin and farm performance using transparent methodology.

It is popular with farmers wishing to plan farm activities.

The dynamic aspect of the report is especially useful in the context of volatile commodity prices.

RBR
Rural Business Research

FBS Databuilder

FBS data builder is a specialist interactive system for professionals and researchers. It allows direct interrogation of Farm Business Survey (FBS) data to construct user defined tables.

"FBS databuilder can carry out analysis in an afternoon that might once have been the subject of a PhD thesis"

Martin Seabrook,

Retired Professor, University of Nottingham

RBR
Rural Business Research

FBS Data Builder

Some dimensions of FBS data builder:

- Largest standard table has 880 cells
- 157,000 tables using standard dimensions
- Nearly 7 million tables using size groups

RBR
Rural Business Research

FBS Databuilder

FBS databuilder generates custom tables to your design without compromising confidential farm data.

We have fitted a new engine to FBS databuilder, and it calculates each cell in 0.82 seconds.

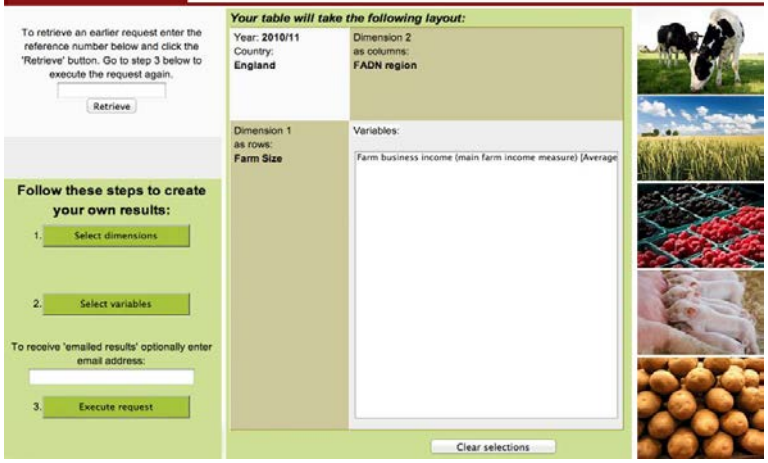
It has since:

- calculated 8,300 tables
- with 21m data items

It can produce over 10m different tables.

RBR
Rural Business Research

Requesting data



RBR Rural Business Research

Data table

Rural Business Research: Cambridge
The Farm Business Survey is conducted on behalf of, and financed by, the Department for Environment, Food and Rural Affairs and the data collected in it are Crown Copyright
22-Jan-2012_11:44:42
RBU, Department of Land Economy, Cambridge CB3 9EP

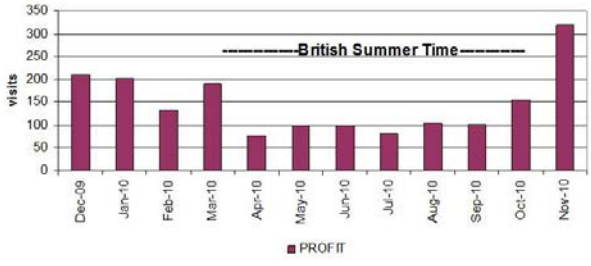
FBS data builder. v49[2.3.b]: Table 5412
England: 2010/11

Farm Type	See footnotes	Cell Variable Statistic	FADN region: ENGLAND	North	East	West
		Income from	Average per farm			
ALL FARM TYPES			18,935	11,754	27,921	12,814
Cropping			41,017	28,121	46,828	33,068
— Cereals			36,811	24,006	43,761	23,389
— General cropping			58,880	40,343	66,058	50,986
— Horticulture			27,508	18,109	25,487	35,969
— — Specialist fruit			7,274	D	-1,793	27,869
— — Specialist glass			38,639	35,990	46,144	17,011
— — Specialist hardy nursery stock			D	D	D	D
— — Other horticulture			24,394	F	41,494	F
Grazing Livestock			4,046	5,229	-2,400	7,422
— Dairy			30,566	34,827	9,832	36,584
— Grazing livestock (lowland)			-6,324	-5,126	-5,901	-7,183
— Grazing livestock (LFA)			-8,358	-8,609	-10,496	-6,788
— — Grazing livestock (DA)			-8,142	-11,686	F	-1,435
— — Specialist sheep (SDA)			D	D	D	D
— — Other grazing livestock (SDA)			-9,949	-8,102	F	-15,653
Other types & mixed			15,777	14,226	24,206	6,576
— Pigs			32,840	45,666	37,326	9,272
— Poultry			51,266	12,667	85,825	39,770
— Mixed			4,398	8,574	7,117	-3,409

Footnotes:
D Data suppressed in accordance with FBS Disclosure protection rules
F Too few observations to give reliable estimate. Try using confidence intervals instead
(1) Footnote on output, etc
(2) Excludes BLSA. Farm business income is equivalent to the financial accounting measure Net Profit.

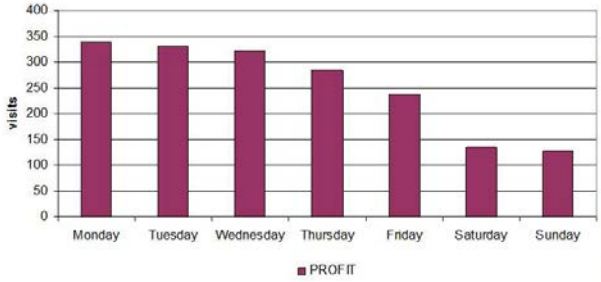
RBR Rural Business Research

Our users: seasonal use



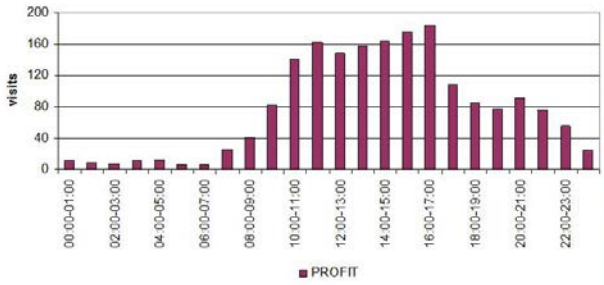
RBR Rural Business Research

Our users: use over the week



RBR
Rural Business Research

Our users: use through the day



RBR
Rural Business Research

FBS data at www.farmbusinesssurvey.co.uk

Databuilder, Regional and Benchmarking reports are available at:
www.farmbusinesssurvey.co.uk

The reports were devised and developed by Richard Dexter, Ben Lang, Rachel Lawrence, Charles Mbakwe, Roger Price and Mark Reader

Thank you for your attention

Ben Lang
bgal2@cam.ac.uk

8.3 FADN IT infrastructure

Derek Verweij and Eugene Westerhof

WAGENINGEN
UNIVERSITY & RESEARCH

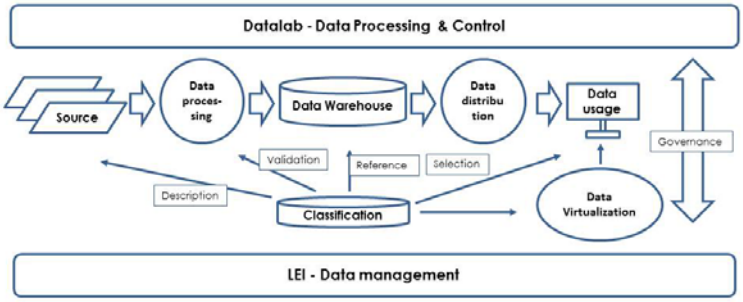
Datamanagement

With applications in
FLINT (partly)
and FADN (current and future)

Pacioli, Sept. 28
Pristina, Kosovo

Derek Verweij & Eugene Westerhof

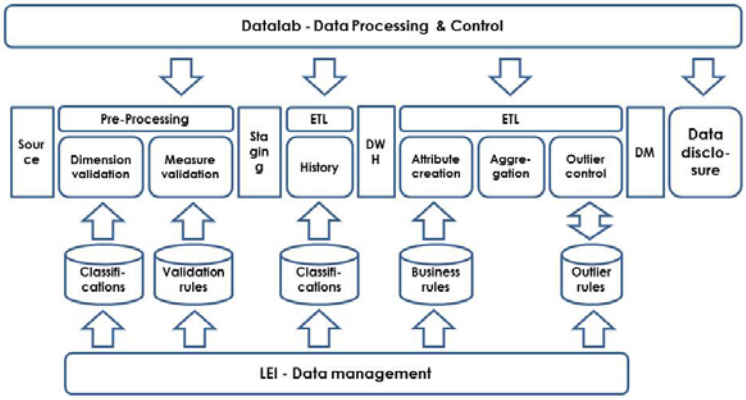
Overview



Project Scope

Datawarehousing

- Congegrate data from multiple sources into a single database so a single query engine can be used to present data.
- Integrate data from multiple source systems, enabling a central consistent view (classification)
- Maintain data history, even if the source transaction systems do not (performance, reproducability)
- Improve data quality, by providing consistent codes and descriptions, flagging (or even fixing) bad data and reducing manual processing



Project Architecture

Data Dimensions: Classifications

Subject:
Other Gainful Activity

Variable:
Production

Unit:
Quintals

Type:
Processing of cow's milk

103

Year:
2015

Country:
Hungary

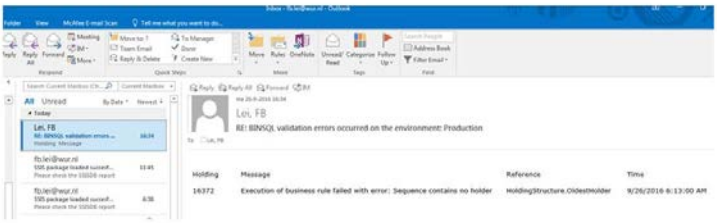
Holding:
768.7.75195

L_PR_261_MD_Q

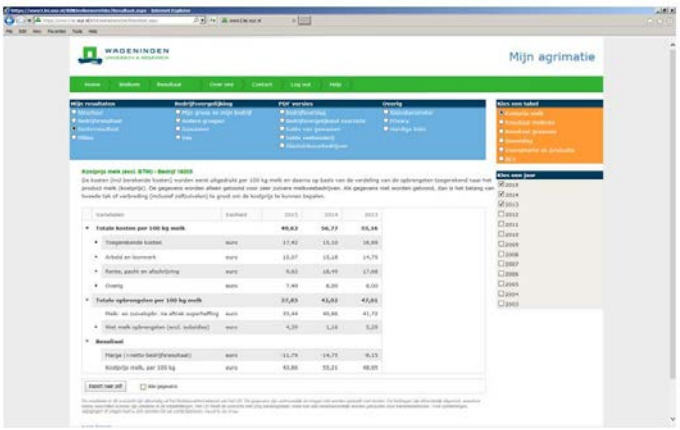
Current state of affairs

- First implementation of technical solution delivered
- Three pilots in three different domains:
  - Foodprofiler. Smart phone app ('gamified') to collect data on consumption patterns (daily)
  - KCB; dutch export data on agricultural products
  - BIN (Dutch FADN+ data on farm level). Data released for research updated daily
- Rule Component used for FLINT

Automatic validatoin feedback



Farmer feedback website



Validation Rules

RICA

If L_CV_261:321_MD_V > 0

then

L_OV_261:321_MD_V > 0

or

L_PR_261:321_MD_Q > 0

FLINT

if (Type == {Processing of cow's milk}
|
{Processing of buffalo's milk}
|
{Processing of sheep's milk}
|
{Processing of goat's milk})
&
ClosingValuation > 0

then Production > 0
|
OpeningValuation > 0

FLINT

- 170 variables and 60 dimenions in 40 'subjects' (tables) (51000 variables in RICA1)
- All (~200) FLINT coherence tests implemented
- 435 RICA test automatically generated from rule configuration XML provided by the Commission
- 63 tests not generated because of missing information and different processing of lookups (= dimensions).
- Runs all tests for 100 farms is less than half a minute (RICA1 test server takes 2.5 hours)
- Rule engine Software is free for use and we welcome an open source community effort

Future developments

- Wageningen Economic Research needs to find new funding: government funding will decrease, PPS will have to pick up as will contract research
- What is our market proposition?
  - Research, plus combination of various data
- So: Agro Economic Platform in the making
- Data Warehouse will accomodate multiple datasources, including third party sources

Things to be considered

- Classification is key!
- Usability: researchers will have to easily 'construct' their information, minimal dependency on Datalab department
- Open data: is a challenge in terms of marketing (what is our market proposition?)
- Virtual data – just in time (cost, actuality)
- Big data: being developed on university level

Thank you!

- Questions

9 Paper session VII: Economic Analysis:

9.1 Implications of a Brexit for British Agriculture

Hans Vrolijk

Background

- Referendum June 23 to leave or stay in EU
- Follows a promise made by Prime Minister Cameron in 2013 that if the Conservative party would be re-elected in May 2015
- Leaving the EU is likely to have significant implications for the agricultural sector in the UK.
- (1) conditions governing international trade in agricultural products and (2) public support payments for farmers are critical elements
- Research project commissioned by National Farmers Union (NFU)

WAGENINGEN
UNIVERSITY & RESEARCH

Implications of EU exit for British Agriculture

Hans Vrolijk, Wageningen Economic Research

Pacioli 24, September 25-28, Pristina, Kosovo

WAGENINGEN
UNIVERSITY & RESEARCH

Objective

Quantification of effects of:

- Possible trade and agricultural support scenarios on the
- UK agricultural production, trade, farm gate prices and farmers' income levels

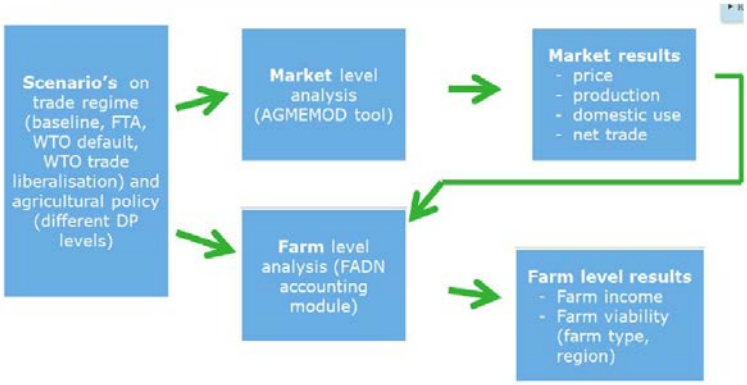
in case of the UK leaving the EU.

Scenarios (two dimensions):

- (1) a UK-EU Free Trade Arrangement (FTA); (2) a WTO default position; (3) a UK Trade Liberalisation (TL) scenario.
- (1) a continuation of all direct payments; (2) a 50% reduction of direct payments; (3) no direct payments

WAGENINGEN UNIVERSITY & RESEARCH

Approach



WAGENINGEN UNIVERSITY & RESEARCH

Results of trade scenarios

- Under the FTA and WTO scenarios, UK domestic prices increase, mainly driven by trade facilitation costs.
- Under the WTO scenario, increases are intensified because certain commodities no longer benefit from the EU's TRQ import concessions
- The agricultural product prices are projected to increase
  - FTA scenario range of 2.3 to 5.5%,
  - WTO scenario range of 7.2 to 11.5%.
- A UK TL scenario implies a lowering of the UK's external import tariffs by 50%.
  - significant impact on UK meat and dairy prices as current import rates are higher for these products.

WAGENINGEN UNIVERSITY & RESEARCH

Farm level approach

Based on UK data (2012/2013)

FARM level simulations to estimate impacts of:

- Price changes of outputs as estimated by AGMEMOD
  - mapping between AGMEMOD and FADN product groups
- Price changes of selected inputs (e.g. feed) on farm results as estimated by AGMEMOD
- Change in direct payments to farmers

On farm incomes and farm viability

WAGENINGEN UNIVERSITY & RESEARCH

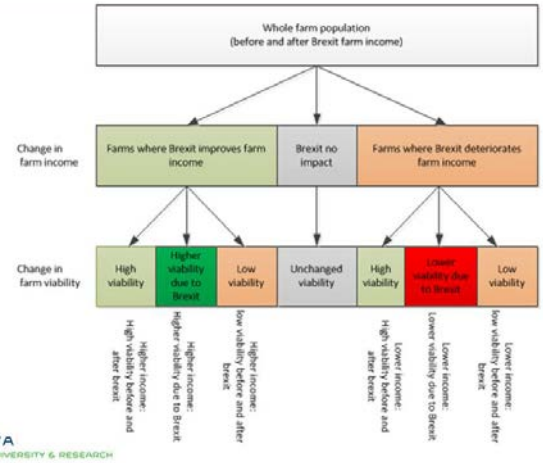
Farm level approach

- Three types of results analysed
  - **Average farm incomes** of groups of farms with and without Brexit
  - Change in **farm income at farm level**: % of farms with a negative impact on farm income due to Brexit
  - Change in **farm viability**: % of farms with an improved / deteriorated viability due to Brexit

- Farm viability defined as the extent to which opportunity costs of own labour and assets can be covered by farm income

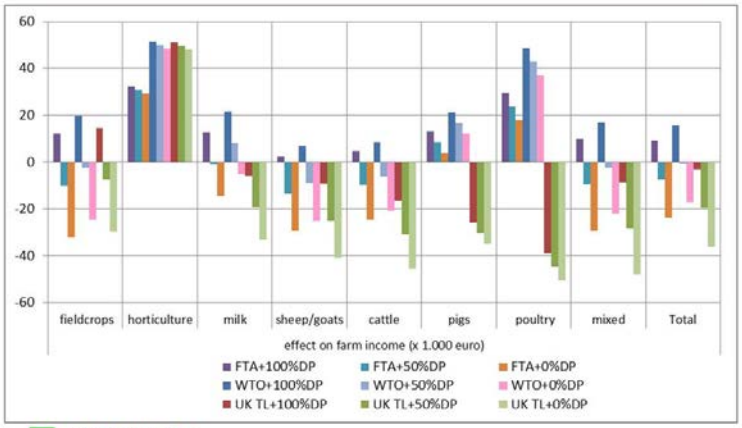
WAGENINGEN UNIVERSITY & RESEARCH

Farm level approach



WA UNIVERSITY & RESEARCH

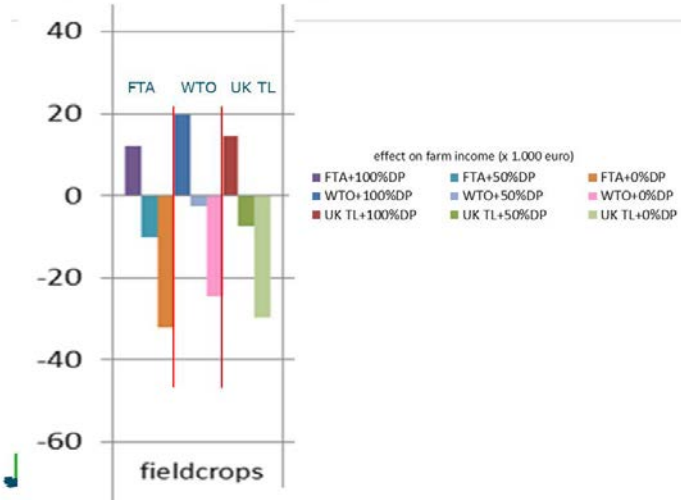
Impact on average farm incomes (types)



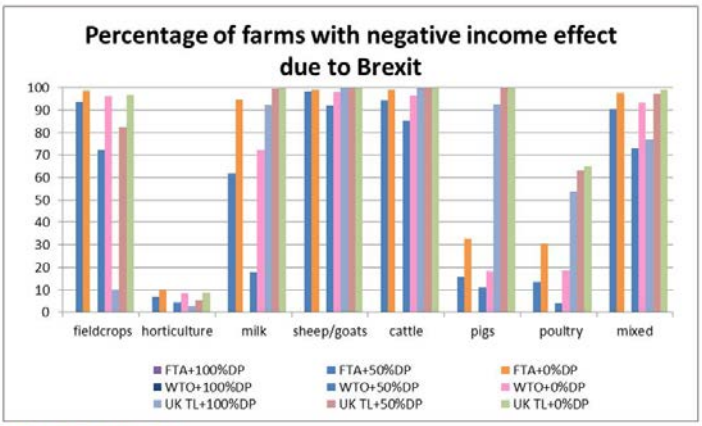
WAGENINGEN UNIVERSITY & RESEARCH

Data source: EU-FADN – DG AGRI; calculations LEI

Impact on field crop farms



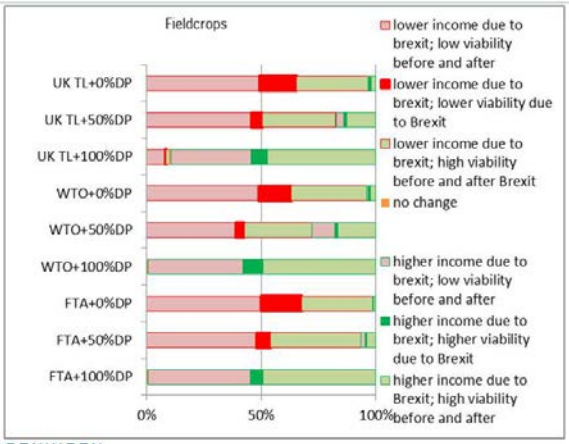
Negative farm level income effect



WAGENINGEN UNIVERSITY & RESEARCH

Data source: EU-FADN – DG AGRI; calculations LEI

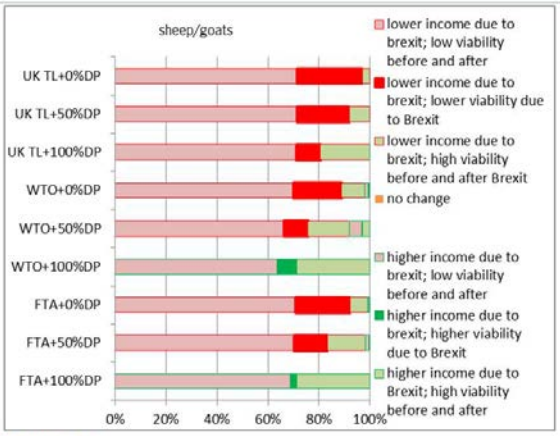
Impact of Brexit on farm viability



WAGENINGEN UNIVERSITY & RESEARCH

Data source: EU-FADN – DG AGRI; calculations LEI

Impact of brexit on farm viability



WAGENINGEN UNIVERSITY & RESEARCH

Data source: EU-FADN – DG AGRI; calculations LEI

Conclusions

- In FTA and WTO scenarios farm-gate prices increase, supporting farm incomes (but reducing consumption)
- More liberalised trade: farm-gate prices fall, benefiting consumers through lower prices but hitting farm incomes in many sectors.
- For most sectors the biggest driver of UK farm income changes is the level of public support payments available.
- The positive price impacts on farm incomes seen in both the FTA and WTO default scenario are offset by the loss of direct support payments.
- A reduction of direct payments would further increase the negative impact seen in UK Trade Liberalisation scenario.

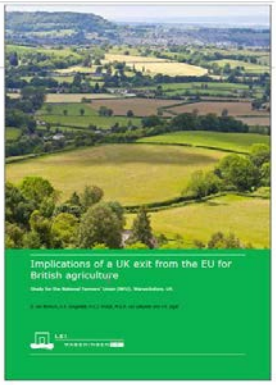
WAGENINGEN UNIVERSITY & RESEARCH

Impact

- Brexit supporters insist support to UK farmers would continue in the event of Britain voting to leave the EU. However, farmers have raised concerns about whether this financial support would be forthcoming, as the government has previously argued against direct payments through the CAP (the guardian, April 18)
- Resolution passed by the NFU council: "On the balance of existing evidence available to us at present, the interests of farmers are best served by our continuing membership of the European Union."

WAGENINGEN UNIVERSITY & RESEARCH

Further information



- Van Berkum, S., R. Jongeneel, H. Vrolijk, M. Van Leeuwen and J. Jager (2016). ***Implications of a UK exit from the EU for British agriculture***. LEI Report 2016-046b (study for the National Farmers' Union (NFU), Warwickshire, UK), LEI-Wageningen UR,The Hague.
- Jongeneel, R., S. van Berkum, S. and H. Vrolijk (2016), **Brexit: Breaking Away – Would it Pay?** EuroChoices, 15: 26–33.

WAGENINGEN UNIVERSITY & RESEARCH

9.2 Quality analysis of the FADN results for Slovenia

Maja Kozar

Agricultural Institute of Slovenia

Quality analysis of the FADN results for Slovenia – first stage results

Maja Kožar (maja.kozar@kis.si)
Agricultural Institute of Slovenia

24th PACIOLI workshop
Pristina, September 25th-28th 2016

Outline of presentation

- Motivation for research
- Data quality assessment: theory
- FADN data quality management: EU, Slovenia
- Approach used
- Selected components of data quality – first stage results
- Conclusions
- Key mid-term recommendations
- Limitations and recommendations for further research

Kmetijski inštitut Slovenije 2

Motivation

- **FADN data: data gold mine and invaluable data input for EU** (50 years of FADN conference, June 2015), wide range anc volume of different uses throughout EU (EC and EU member states)
- **But not in Slovenia** – (hints of) insufficient quality by several quality components (previous research), modest use
- **Slovenian FADN: total quality management not systematically developed yet;** comprehensive quality analysis of FADN for Slovenia not performed yet
- **But growing awareness about data richness and potentials of FADN for Slovenia:** incentive for a national project

FNVA per AWU and remuneration of family labour per FWU, by Member State in 2013 (average in EUR)

Source: EU Farm Economics Overview based on 2013 FADN data; 2016: Figure 1.3, pg. 12)

Kmetijski inštitut Slovenije

Motivation – Cont.

- **‚Development of Holistic Model of Agricultural Holdings and Related Databases for Decision Making in Slovenian Agriculture'**; 100% state financed, 3-year project; partners: Agricultural Institute of Slovenia, University of Ljubljana, Agricultural Advisory Service (public)
- **Key aim - from the perspective of FADN data quality:** systematic, in-depth quality analysis of FADN data for Slovenia, recommendations to improve data quality & usability
- **2-stage project - from the perspective of FADN data quality:**
  - *First stage:* quality analysis of Slovenian FADN from the organizational (operational) perspective
  - *Second stage:* more in-depth analysis of basic FADN data (cross-checking with other databases, model)
- **Results presented today** – first stage results (collected up to December 2015)

Kmetijski inštitut Slovenije 4

Data quality assessment: theory

- **Quality of data: ‚fitness for use'** (Statistics Canada's Quality ..., 2002)
- Not only *accuracy* (one component); but a **mixture of several different components/dimensions**
- **Selection, range, hierarchy of components** – user defined

EUROSTAT (European Statistics Code of Practice, 2011) quality at 3 levels:
- institutional environment (system)
- statistical processes
- statistical output

- **Assessment and monitoring of data quality:** part of total quality management (TQM); rigorous procedures in commercial companies and statistical offices; quality of EU statistics – legislative obligations

Kmetijski inštitut Slovenije 5

FADN data quality management (EU)

- **No new idea;** proposals for a more comprehensive (total) quality management of FADN data following example of statistical offices in 90s (first PACIOLI workshops);
- **FADN not official statistics,** but strongly connected, also some MS already have similar starting point/approach (recent efforts in Sweden, Denmark; FADN within statistics offices)
- **But to our knowledge not at the EU level;** main reasons: different systems of data collecting, processing, quality assessment, time consuming procedures
- **Growing awareness about multidimensional nature of quality of FADN data/systems** (recently: Bradley and Hill, 2015; Eur. Court of Auditors, 2016)
- **At EU level very detailed and harmonized activities regarding:**
  - *accuracy and reliability* (data quality checks – raw data, aggregate data, sample)
  - *timeliness and punctuality* (determined by legislation)
  - *accessibility and clarity* (more quick infos, periodic publications)
- **Problem: ‚aggregate' approach** (‚aggregate' categories, ‚important' countries, regions, sectors, maintenance of averages/order of magnitude between years...)

Kmetijski inštitut Slovenije 6

FADN data quality management (Slovenian FADN network)

- **At national level no official plan of quality management of FADN data**
- **Top priority: timeliness to fulfill EC obligations;** regarding the data controls: the same system as EC – adopting the ‚aggregate' approach can be a problem!
- **With current staff at the ministry (LAO)** : more proactivity regarding the improvement of data quality and quality assessment by other components, coordinated efforts within the network, better communication:
  - *Accuracy and reliability* (interinstitutional co-operation regarding data quality checks and data validations)
  - *Commitment to quality*: national FADN commission meeting 1x/year
  - *Adequacy of resources*: stability of resources – multiannual contract with accounting office
  - *Timeliness and punctuality*, *accessibility and clarity*: feedback to farms somewhat upgraded and delivered faster
  - *Cost effectiveness*, *non excessive burden on respondents*: Agriculture act (law) now enables interoperability of FADN database with some admin. databases

Kmetijski inštitut Slovenije 7

Approach used

- **Analysis by quality components adapting EU guidelines for preparation of statistical quality reports** (*European Statistics Code of Practice*, 2011; ESS Handbook for quality reports, 2015; Quality Assurance Framework of the European Statistical System, 2015); 3 levels: institutional environment, data and processes
- **First stage of project: Selected components - most problematic for Slovenian FADN or the ones for which assessment was possible within the project capacities:** commitment to quality, adequacy of resources, relevance, timeliness and punctuality, accessibility and clarity, non-excessive burden on respondents and cost effectiveness
- **Second stage of project:** accuracy and reliability, sound methodology and appropriate statistical procedures; update of others if needed
- **Analysis by selected components:** principle (description of component adapted to FADN SLO), indicators, current state of FADN in Slovenia, recommendations
- **Data used:** literature, interviews/talks, SR FADN 2007-13, best practice (other MS)

Kmetijski inštitut Slovenije 8

Interviews

- **Semi-structured interviews;** questionnaire; some questions closed (Likert scale); 2015
- **Interviewees:** farms, advisers, FADN coordinators (focus group), 2 accounting offices
- **Farms:** mixture of ‚pure' FADN sample farms and ‚RDP' farms; from two regions
- **Advisers:** one region
- ***Small sample, not representative – generalizations of findings not recommended!***
- **Nevertheless, very valuable insights**
- **Results** presented as frequencies

Interviewees	Number
Agricultural holdings:	**11**
- Included in FADN sample (not necessarily all years)	7
- Excluded from analysis	*1*
Agricultural holdings analyzed	**10**
Other interviewees (advisers, FADN coordinators, accounting offices):	**13**
Excluded from analysis	*1*
Other interviewees analyzed	**12**
Interviewees - total:	24
Interviewees analyzed - total	**22**

Commitment to quality

‚Slovenian FADN network is committed to quality of data and processes. Strengths and weaknesses are systematically and regularly identified to continuously improve the quality of FADN data for Slovenia.'
(Adapted 4th principle of European Statistics Code of Practice, 2011)

Selected indicators:

- Quality policy is defined and mace available to the public. ✗
- Procedures established to plan and monitor quality of the data (output) production process. ✓
- Data quality is regularly monitored, assessed with regard to possible trade-offs and reported. ✓
- Key results (outputs) regularly and thoroughly reviewed. ✓

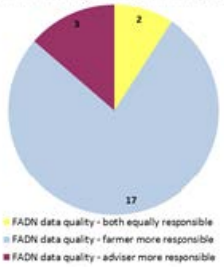
Current state:

No (total) data qual. management regarding FADN
- **Insufficient commitment of key stakeholders** in network (conflicting purposes of FADN in practice, path dependency, avoiding responsibility, uncritical use of results)
- **Almost entirely about fulfilling EU commitments**; some improvements recently

Key recommendation:

- **National consensus about data quality management** (defining key principles to follow - declaration; main stakeholders; divide responsibility)

Opinions about who is more responsible for quality of FADN data: FADN farms or farm advisers (n=22)



Kmetijski inštitut Slovenije

Adequacy of resources

‚The human, financial and IT resources, available to the Slovenian FADN network, are sufficient in volume and quality.'
(Adapted 3rd principle of European Statistics Code of Practice, 2011)

Selected indicators:

- Resources, adequate in magnitude and in quality, are available to meet the key data needs. ✓
- Scope, detail and costs of producing the data are commensurate with data needs. ✗
- Procedures are established to assess the need for collecting new data or discontinue collecting the existing data. ✗

Current state:

- **Scope of resources (esp. HR) not so problematic** (2013: 32 hrs/FADN farm return; avg. 2012-2014: 329 EUR//FADN farm return; source: Bradley in Hill, 2015)
- **Problem of scatteredness of (HR) resources**, esp. extension service (200 advisers in FADN; most max. 15% time engaged in FADN related activities); negative consequences!
- **Improvements:** more proactivity, co-operation

Key recommendation:

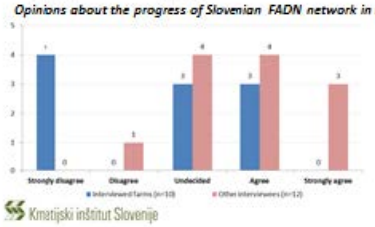
- **Reorganization: increase specialization and HR stability** (tasks reassignment, reorganization of institutions)

Kmetijski inštitut Slovenije 11

Adequacy of resources: survey results

Opinions of the focus group about motivation of farm advisers for FADN related activities (n=7)

Opinions about the progress of Slovenian FADN network in recent years



Kmetijski inštitut Slovenije 12

Relevance

‚FADN data for Slovenia meet the needs of key users in the country.'
(Adapted 11th principle of European Statistics Code of Practice, 2011)

Selected indicators:
- Processes are establishec to consult key users, e.g., about their priority or new data needs. ✗
- Priority data needs are being met and reflected in the work programme. ✓
- User satisfaction is regularly and systematically monitored. ✗

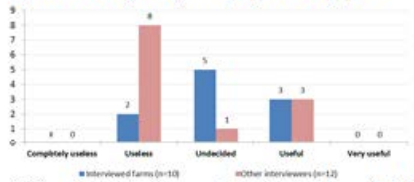
Current state:
- Main purposes of FADN declared on paper, but in practice unsystematically and too modestly implemented; **conflicting purposes, path dependency** – influences relevance and the range of use of the FADN results
- Interview results: **weak understanding of FADN database content, usability and potentials**

Key recommendation:
- **To explicitly define key users and their main data needs;** adapt the activities and organization of Slovenian FADN system to them (esp. sampling, one system for ‚pure' FADN sample farms and ‚RDP' farms)

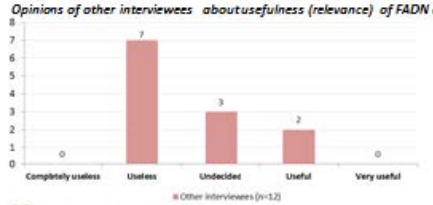
Kmetijski inštitut Slovenije 13

Relevance: survey results

Opinions about usefulness (relevance) of FADN data for farms



Opinions of other interviewees about usefulness (relevance) of FADN data for (farm) advisers



Kmetijski inštitut Slovenije 14

Timeliness and punctuality

‚FADN data for Slovenia are released timely and punctually.'
(Adapted 13th principle of European Statistics Code of Practice, 2011)

Selected indicators:
- European and other international release standards are taken into account. ✗
- Time for the dissemination of data is made public; divergence is publicized in advance & explained. ✗
- User requirements are taken into account as much as possible (publication periodicity). ✗
- Preliminary results can be released when considered useful. ✗

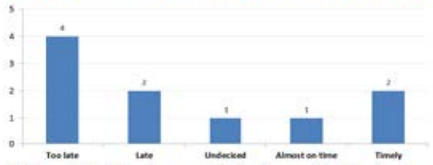
Current state:
- **No time schedule for dissemination**; but legislative deadlines respected
- **Purctuality can't be determined** (no time schedule, scarce periodic publications)
- **Timeliness: data too late for decision-making** (12-24 months after end of accounting year)
- Improvement: **FADN feedback results to farms quicker**

Key recommendation:
- **Further automatization;** ‚cigital by default', database pooling & exchange, speeding up or abolishing administrative procedures

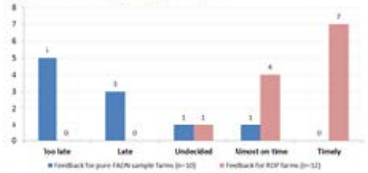
Kmetijski inštitut Slovenije 15

Timeliness and punctuality: survey results

Opinions of interviewed farms about timeliness of the FADN feedback results (n=10)



*Opinions of other interviewees about timeliness of FADN feedback results for farms (differentiated by type of farms)**



* Feedback for pure FADN sample farms (n=10); 2 persons do not give ratings for the type of farms

Kmetijski inštitut Slovenije 16

Accessibility and clarity

‚FADN data for Slovenia are presented in a clear and understandable way and easily accessible to key users in the country.'
(Adapted 15th principle of European Statistics Code of Practice, 2011)

Selected indicators:

- (Meta)data presented in form that enables appropriate interpretation and comparisons ✗
- Modern ICT used in dissemination, hard copy (paper) only if necessary ✗
- Possibility of custom-designed analyses of FADN data ✗
- Access to microdata allowed (privacy respected) ✓
- Users are informed about methodology, uses, quality of FADN data ✓

Current state:

- Accessibility and clarity traditionally the **most problematic quality components**
- FADN results, information: **too scarce, weak public presence, not very interesting** outlay…

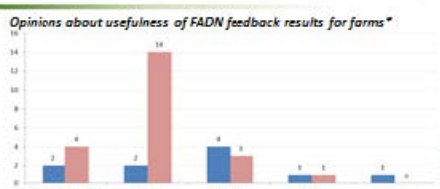
Key recommendation:

- **Accessibility: ‚digital by default'** for respondents and users of FADN data, simplify access to FADN data (privacy respected!)
- **Clarity: ‚simplification and personalization'** (easy, quick, efficient, personalized)

Kmetijski inštitut Slovenije 17

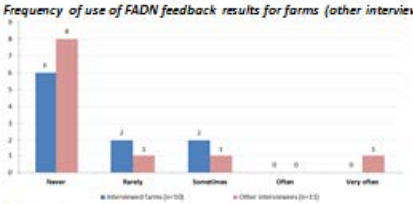
Accessibility and clarity: survey results

*Opinions about usefulness of FADN feedback results for farms**



* Other interviewees (n=22): 10 respondents from this group gave response ratings for pure FADN sample farms only, for RDP farms and 2 respondents gave ratings only for RDP farms

*Frequency of use of FADN feedback results for farms (other interviewees: frequency of use at their work)***



** Other interviewees (n=22): one person from this group did not respond to this question.

Kmetijski inštitut Slovenije 18

Non-excessive burden on respondents

‚The reporting burden of Slovenian FADN agricultural holdings is not excessive and is proportionate to the needs of the key users in the country.'
(Adapted 9th principle of European Statistics Code of Practice, 2011)

Selected indicators:

- Use of administrative and other data; electronic means ✓
- Data sharing along all parts of FADN network ✓
- Specific measures, enabling linking of data sources in order to reduce reporting burden ✓

Current state:

- **Improvement in last years:** option for electronic/online data entry
- **Enabling better interoperability** and data exchange of FADN with other databases: still limited; data exchange still happens only at the last stage
- **Data sharing** happens, but **weak**

Key recommendations:

- **‚Once only'**: same information can be collected only once from the respondents, but to be used many times
- **‚Digital by default'** for respondents

Kmetijski inštitut Slovenije 19

Cost effectiveness

‚Resources in the Slovenian FADN are used effectively.'
(Adapted 10th principle of European Statistics Code of Practice, 2011)

Selected indicators:

- Processes of data collection, processing and dissemination are optimized with the help of information and communications technology. ✓
- Proactive efforts are made to improve the usability of the data ✓

Current state:

- **Slovenian FADN relatively cost effective** (previous studies), but **too little benefits** from the data for both, respondents and key data users
- **Improvements in last years** (both indicators): **software** ‚FADN evidenca', proactive and frequently coordinated activities of ministry and advisory service (e.g. regarding the increasing the usability/use of FADN data)

Key recommendation:

- **‚Digital by default'** for data entry and dissemination of results
- **Review necessity of paying fee to farms** (‚pure' FADN sample farms) to participate in FADN

Kmetijski inštitut Slovenije 20

Conclusions

- **Main challenges of Slovenian FADN system:**
  - Path dependent scope and scatteredness of the resources, especially human
  - Key users and their data needs not explicitly defined
  - Accessibility and clarity too weak for (key) users
  - FADN results too late for decision making

  Some improvement with current staff at ministry: co operation in the network, planning and bigger proactivity at other quality components (not only timeliness and punctuality)
- **Based on first stage results it is not possible to argue anymore, that quality management of FADN data for Slovenia is limited only to fulfilling EC obligations**
- ***National consensus of key stakeholders - catalyst for significant improvement of quality of FADN data for Slovenia!***

Kmetijski inštitut Slovenije 21

Key mid-term recommendations – first stage of study

- **Forming national consensus** about key users, their key data needs and uses
- **Increase specialization of staff** engaged in FADN; **reorganization** of tasks and institutions
- **‚Digital by default':** electronic and online ways to enter & control, process and disseminate the data, further automatization
- Strengthen and improve quality of **dissemination of FADN results** and **FADN related education** (esp. for advisers); ‚simplification and personalization' (feedback for farmers: easy, quick, efficient, personalized)
- **‚Once only':** increase level of database interoperability and data exchange, shorten/eliminate the administrative procedures
- ***More efficient use of the existing resources and infrastructure in the Slovenian FADN network!***

Limitations and recommendations for further research

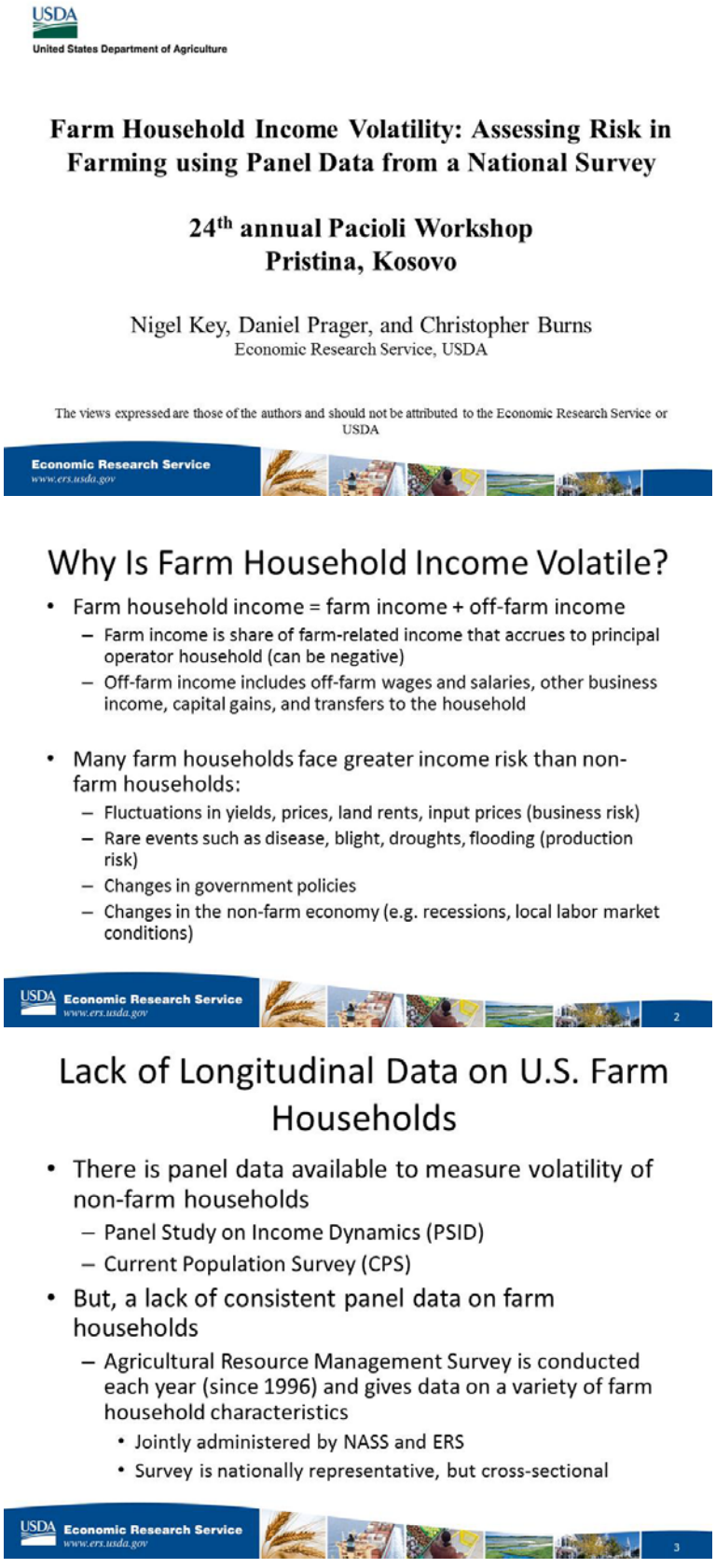
- **Key limitation of interviews:** small, unrepresentative sample – problem of generalizing findings
- **Questionnaire:** to be upgraded
- **Nevertheless, results say a lot:** interviewees from all parts of Slovenian FADN network, especially valuable was the insight into thinking of FADN coordinators
- **Second stage of the project – plan to analyze following quality components:**
  - *accessibility and clarity* (economic counseling to farms)
  - *accuracy and reliability*, *sound methodology and appropriate statistical procedures* (cross-checking of FADN data with other databases, mocel) and
  - *relevance* (support to policy making, identify data needs of advisers and farms)

Thank you for your attention!

maja.kozar@kis.si

9.3 US farm household income volatility

Daniel Prager



USDA
United States Department of Agriculture

Farm Household Income Volatility: Assessing Risk in Farming using Panel Data from a National Survey

24th annual Pacioli Workshop
Pristina, Kosovo

Nigel Key, Daniel Prager, and Christopher Burns
Economic Research Service, USDA

The views expressed are those of the authors and should not be attributed to the Economic Research Service or USDA

Economic Research Service
www.ers.usda.gov

Why Is Farm Household Income Volatile?

- Farm household income = farm income + off-farm income
  - Farm income is share of farm-related income that accrues to principal operator household (can be negative)
  - Off-farm income includes off-farm wages and salaries, other business income, capital gains, and transfers to the household
- Many farm households face greater income risk than non-farm households:
  - Fluctuations in yields, prices, land rents, input prices (business risk)
  - Rare events such as disease, blight, droughts, flooding (production risk)
  - Changes in government policies
  - Changes in the non-farm economy (e.g. recessions, local labor market conditions)

USDA Economic Research Service
www.ers.usda.gov
2

Lack of Longitudinal Data on U.S. Farm Households

- There is panel data available to measure volatility of non-farm households
  - Panel Study on Income Dynamics (PSID)
  - Current Population Survey (CPS)
- But, a lack of consistent panel data on farm households
  - Agricultural Resource Management Survey is conducted each year (since 1996) and gives data on a variety of farm household characteristics
    - Jointly administered by NASS and ERS
    - Survey is nationally representative, but cross-sectional

USDA Economic Research Service
www.ers.usda.gov
3

Sampling ARMS respondents

- ARMS administered in three phases
  - Phase I: initial screen for eligible farms
  - Phase II: field-level (production practices, resource and input usage)
  - Phase III: farm-level (farm finances, operator/household demographics and finances)
- ARMS has a stratified random sampling design
  - Selection probabilities vary by region and commodity type
  - Larger farms are oversampled in each year
    - More likely to be sampled again over time
  - Population estimates generated with sampling weights

Linking farms through time in ARMS

- NASS identifies farms based on the principal operator
  - Person who makes the managerial decisions on farm
- Each principal operator is given an ID, which does not change over time
  - (POID) Person-operation identification
- For this study, we match on POID and link farm operators (and their operations) over time
  - Unbalanced panel with 27,515 year-pairs
    - No sampling weights used in analysis
  - Because larger farms appear more often in panel, our data is representative of U.S. commercial farms (i.e. Total sales > $350,000)

POIDs that are observed at least twice

	Year 2														
Year 1	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
1997	-	17	29												379
1998	272	97	151	183											703
1999	178	228	224	282	21										1,113
2000		91	379	339	282	34									1,431
2001			92	34	224	262	213								1,131
2002				241	511	438	384	265							1,839
2003					114	975	654	544	57						2,794
2004						211	117	559	62	557					3,054
2005							378	153	82	66	748				3,605
2006								174	1,146	83	646	668			3,464
2007									187	935	611	543	448		2,724
2008										136	192	719	651	46	3,058
2009											167	1,229	66	-	2,056
2010												164	-	-	164
	450	433	875	1,079	1,152	1,920	1,746	1,695	1,534	1,777	2,364	3,323	1,165	46	27,515

How to Measure Income Volatility?

- Measuring farm household income volatility is difficult because of negative income values.

One measure of income volatility:

- Absolute Coefficient of Variation (ACV)
  - lower limit of 0, unbounded above

$$ACV_{it} = \left| \frac{\sqrt{(\sum y_{it} - y_{i.})^2}}{\bar{y}_{i.}} \right|$$

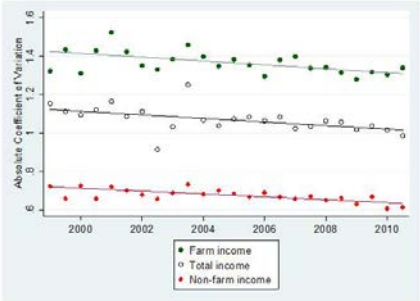
Where $\bar{y}_{i.} = 0.5 * (y_{it} + y_{it-1})$

Crop Farms Have Higher Household Income Volatility

Farm income	All farms	Livestock	Crop
Median	$48,057	$35,598	$71,223
Median absolute change between years	$86,462	$63,765	$123,903
Share negative in at least one year	0.46	0.49	0.44
Share negative in both years	0.14	0.15	0.11
Mean ACV	1.35	1.37	1.35
Off-farm income			
Median	$33,037	$31,261	$34,647
Median absolute change between years	$16,793	$15,149	$18,341
Mean ACV	0.67	0.67	0.67
Total household income			
Median	$98,893	$83,742	$125,176
Median absolute change between years	$100,925	$77,470	$138,021
Share negative in at least one year	0.26	0.25	0.28
Share negative in both years	0.04	0.03	0.04
Mean ACV	1.06	1.03	1.10

Source: 1996-2014 ARMS panel

Farm household income, farm income, and off-farm income volatility have declined



Regression Analysis

What factors are associated with farm household income volatility?

- Estimation Equation:

$$y_{it} = \alpha + \boldsymbol{X_1'\beta} + \boldsymbol{X_2}'\boldsymbol{\gamma} + Year_t + State_i + \epsilon_{it}$$

- $\boldsymbol{X_1}$ – *farm, operator, and household characteristics*
- $\boldsymbol{X_2}$ – *unbalanced panel data controls*
  - *E.g.*, the number of times a farm appears in the dataset and the distance between observations

Regression results (selected variables)

	Dependent variable: Ln(ACV)		
	Total Household Income	Farm Income	Off-farm Income
Mid-year	-0.016***	-0.009**	-0.016***
Year span	0.025***	0.033***	0.053***
Farm Type: Cattle and livestock	-0.105***	-0.056*	-0.074***
Assets $750K-1.5M	0.215***	0.068**	0.082***
Assets $1.5M-3.0M	0.352***	0.118***	0.184***
Assets $3.0M+	0.466***	0.110***	0.322***
Operator Education: High school	-0.122***	-0.079**	-0.216***
Operator Education: Some college	-0.126***	-0.053	-0.265***
Operator Education: College or more	-0.217***	-0.114***	-0.317***
Primary occupation: farmer	0.498***	-0.039	0.459***
Operator Age: 65+	-0.040*	0.100***	-0.200***
Operator Married: Both years	-0.269***	-0.055	-0.388***
Unemployment Rate	0.010**	0.002	0.002

Note: State-clustered standard errors (*** p<0.01, ** p<0.05, * p<0.1)

Findings

- Farm households have volatile income
  - Fluctuations in farm income is primary driver of volatility
  - Off-farm income less volatile
- Regression results show a secular decrease in household, farm, and off-farm income volatility
  - Larger farms (assets) and crop farms have more volatile income
  - More educated operators and older operators have lower income volatility (household, farm and off-farm)
  - Married operators have lower household and off-farm income volatility
  - Local labor market conditions affect ability to smooth household income volatility

Thank you!

Questions?

My contact info:
christopher.burns@ers.usda.gov
+01 202 694 5329

Wageningen Economic Research
P.O. Box 29703
2502 LS The Hague
The Netherlands
T +31 (0)70 335 83 30
E communications.ssg@wur.nl
www.wur.eu/economic-research

Wageningen Economic Research
REPORT
2017-009

To explore the potential of nature to improve the quality of life

Wageningen Economic Research
P.O. Box 29703
2502 LS Den Haag
The Netherlands
E communications.ssg@wur.nl
www.wur.eu/economic-research

REPORT 2017-009
ISBN 978-94-6343-093-7

The mission of Wageningen University and Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 5,000 employees and 10,000 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.