Farm level productivity calculation and service in EconomyDoctor

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Farm level productivity calculation and service in EconomyDoctor

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Method and data of productivity calculation

- Divisia index method has been used

- Data source: Finnish FADN data 2000-2013
- 89 outputs and 92 inputs (all the cost items included)
- Price indices of Statistics Finland
- Productivity indices has been calculated based on:
  - Average farm (production types, regional results etc.)
  - Farm level data and farm level productivity indices which has then been weighted to average level

Farm level calculation

- Farms with zero revenue (output) has been removed

- Negative revenue items has been changed into cost items

- Revenue and cost items are divided by the total sum of revenues and costs in order to get **revenues shares and costs shares** (if revenue or cost item is missing, then share is set to zero)

- Revenue items and cost items are divided by the price indices in order to have **outputs and inputs** and then logarithm is taken (if revenue item or cost item is negative or missing then log(1), which is zero)

- With all the firms input and output indices has been scaled to "one" in 2001 or in the first year they join FADN

- Weighting by the fadn-weights and by the market share (with farm level calculation)

- Weighting by the fadn-weights (with average level calculation)

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Productivity service in EconomyDoctor

- Productivity calculation will be launched as a new service in the EconomyDoctor website (www.luke.fi/economydoctor)
- SAS -statistical program is used to calculate productivy indices and to produce reports
- Averages results can be observed by using different classification factors and their combinations
  – regions (different regional breakdowns)
  – production types
  – size classes
- Classifiers used is based on the requests of the user
- Weighting factors are calculated based on the production type, size class and regional breikdown selection

EconomyDoctor Productivity –service. User Interface.
www.luke.fi/economydoctor

| 1998-2013 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 | 2005 | 2004 | 2003 | 2002 |

Own Criteria

Select up to six classifiers and additional classifiers and press Generate button
Multiple classifiers can be selected by holding down CTRL key on keyboard while selecting

Year	2. Classifier	
2014	Subsidy Region	Cereal Farms
2013	Less Favoured Areas	Other Crop Farms
2012	FADN Region	Horticulture indoor
2011	Region (Nuts2)	Horticulture outdoor
2010	Rural Areas	Dairy Farms
2009	County	Cattle Farms
2008	ELY-centre	Sheep goats and other grazing livestock
2007	Province	Pig farms
2006	ProAgria Centre	Poultry farms
2005	Subregion	Mixed production
2004	Municipality	
2003	Production type (SO)	
2002	Production line (SO)	
2001	Economic size (SO)	
2000		

Select additional classifier   Select all   Generate report

Service Production: LUKE, Natural Resources Institute Finland | www.luke.fi/en/

Productivity indices on dairy farms (average level)

Productivity	Dairy Farms												
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Farms represented	17 900	16 900	16 200	15 300	14 400	13 400	12 100	11 200	10 700	10 100	9 480	8 940	8 450
Productivity	1	0,906	0,915	0,942	0,917	0,945	1,025	1,029	1,023	1,027	1,074	1,067	1,045
Output	1	1,066	1,123	1,189	1,207	1,313	1,488	1,589	1,625	1,691	1,753	1,931	1,903
Input	1	1,177	1,228	1,263	1,317	1,389	1,451	1,544	1,588	1,647	1,632	1,809	1,822

Productivity indices on dairy farms (based on farm level calculations)

Productivity	Dairy Farms												
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Productivity	1	0,949	0,974	0,977	0,929	0,949	1,013	0,995	0,986	0,987	1,005	0,956	0,927
Output	1	1,057	1,109	1,163	1,155	1,231	1,368	1,471	1,494	1,532	1,61	1,679	1,811
Input	1	1,143	1,169	1,206	1,263	1,34	1,404	1,529	1,585	1,62	1,673	1,845	2,071

Productivity in dairy farms (productivity indices, based on average level calculation)
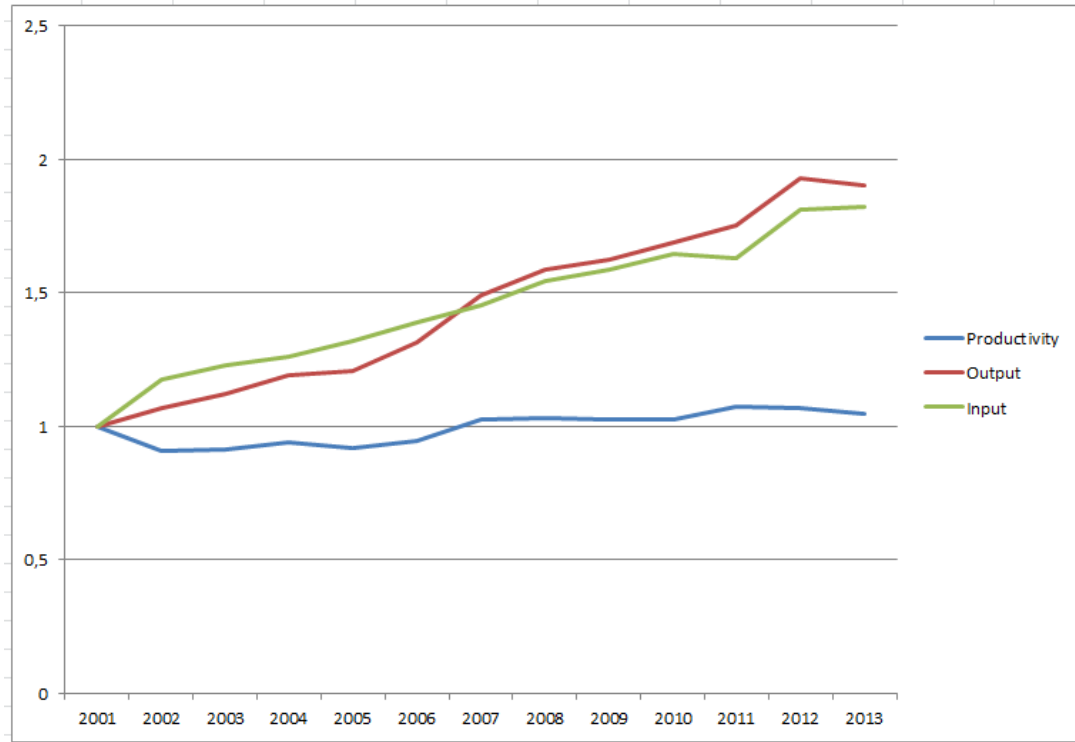
Productivity in dairy farms (productivity indices based on farm level calculation)
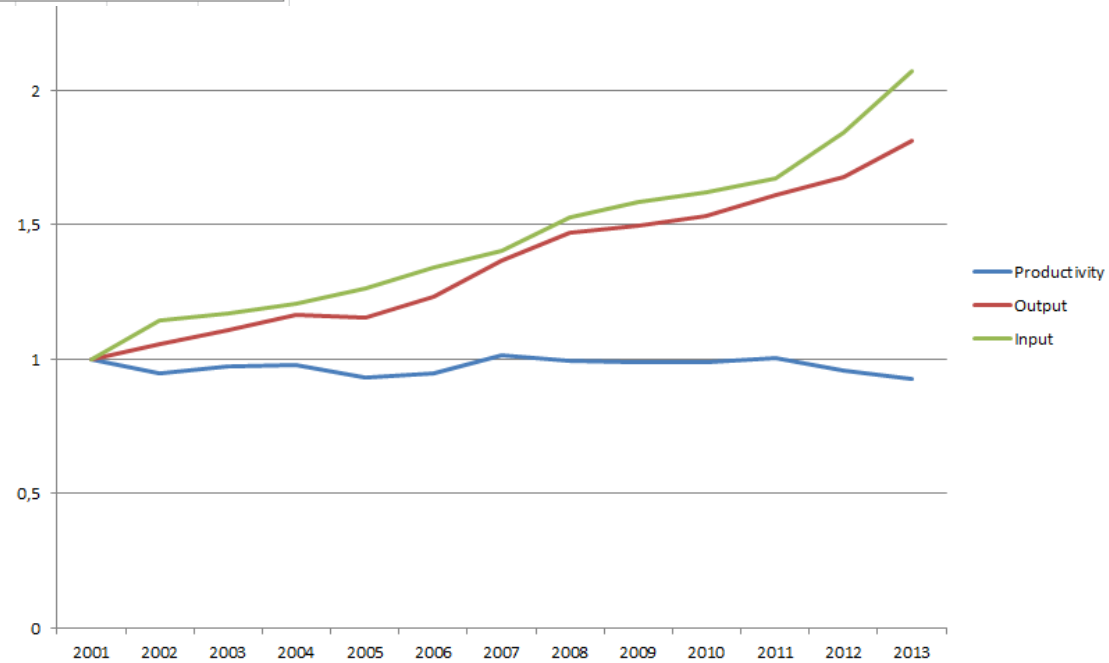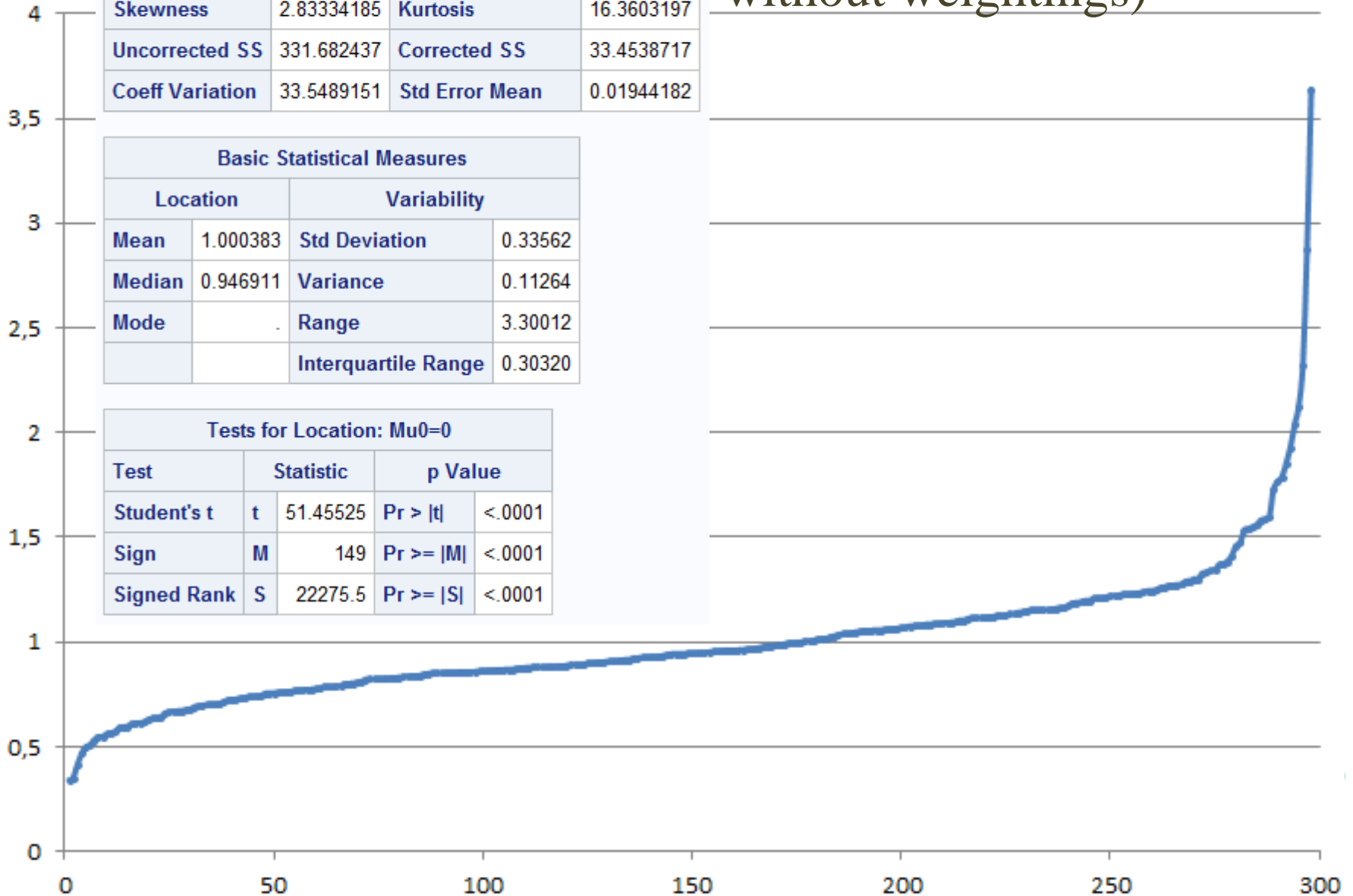
Productivity Indices in Dairy Farms in 2013 (300 farms, without weightings)

Moments			
N	298	Sum Weights	298
Mean	1.00038343	Sum Observations	298.114261
Std Deviation	0.33561779	Variance	0.1126393
Skewness	2.83334185	Kurtosis	16.3603197
Uncorrected SS	331.682437	Corrected SS	33.4538717
Coeff Variation	33.5489151	Std Error Mean	0.01944182

Basic Statistical Measures			
Location		Variability	
Mean	1.000383	Std Deviation	0.33562
Median	0.946911	Variance	0.11264
Mode	.	Range	3.30012
		Interquartile Range	0.30320

Tests for Location: Mu0=0				
Test		Statistic	p Value	
Student's t	t	51.45525	Pr > |t|	<.0001
Sign	M	149	Pr >= |M|	<.0001
Signed Rank	S	22275.5	Pr >= |S|	<.0001

Productivity Indices in dairy farms by farm size

Productivity		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Dairy Farms	25.000_50.000	1	0,876	0,921	0,946	0,962	0,948	1,06	1,169	0,907	0,959	0,936	0,902	0,914
	50.000_100.000	1	0,949	0,984	0,989	0,918	0,946	1,022	0,966	1,01	1,04	1,006	1,01	0,968
	100.000_250.000	1	0,963	0,97	0,976	0,927	0,941	1,013	1,022	0,972	0,959	1,011	0,971	0,973
	250.000_500.000					0,948	0,978	0,994	0,939	0,997	1,017	1,009	0,947	0,909
	500.000_750.000										0,935	0,98	0,93	1,017
	All the Farms	1	0,946	0,971	0,978	0,929	0,949	1,011	0,994	0,985	0,987	1,005	0,955	0,957

- New farms has been scaled to "one" in the first year they have joined FADN (but the size class of single farms might have changed uring the years).
- Panel data could be used as well

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Development in future

- Longer time period (1994 – 2014)
- Price Indices are going to be changed to regional or farm level prices
- With farm level weighting the market share has been used (sum of revenues). Sum of costs could be used as well
- Panel data can be used as well (weighting factors?)
- Interpretation of productivity based on productivity indices?
  - Monitoring the first and last year figures will not be used
  - Trend of productivity indices or regression line is better solution
  - Multiplication of the productivity indices could be on solution
- Comparing the influence of structural changes to productivy
- The productivity indices based on average data and farm level data are not totally same. Comparability?

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Thank you for your attention

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