Estimation of economic results based on Czech FADN

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follow up

23rd Pacioli workshop

28th September 2015
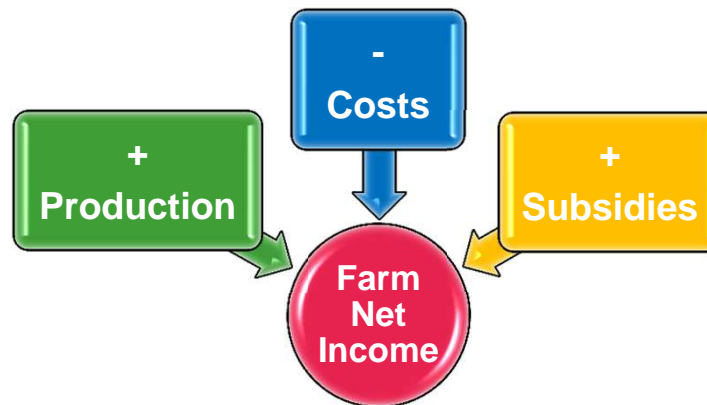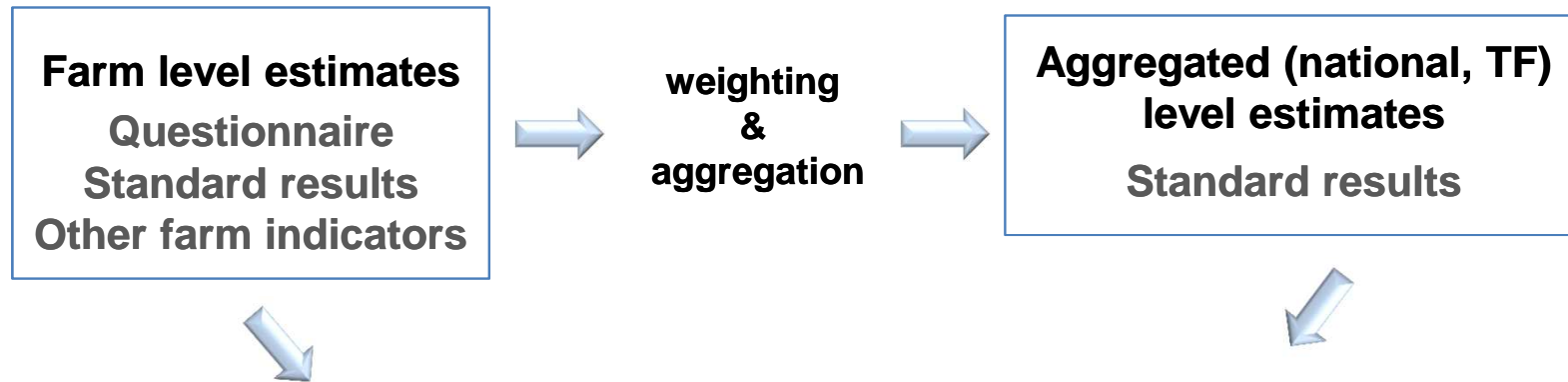
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What do we estimate...

... FADN CZ questionnaire

I. stage

- estimation **10 months** before FADN final results are ready
- December of current accounting year
- input information is known

Done

II. stage

- estimation **13 months** before FADN final results are ready
- September of current accounting year
- input information partly known, partly estimated

Done

III. stage

- forecast **22 months** before FADN final results are ready
- December of preceding year
- scenarios of following year results, no information known

Done

IV. stage = II. stage method

- at the time of harvest of current year
- offering first estimated results to farmers
- on-line access into database, statistics, financial analysis

Ongoing

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How do we estimate

DATA & FORECAST

- Assumptions

- Time series analysis

- Qualified estimation

- Prices, costs, subsidies

PROJECTION

- Indices formation and integration into model

- Farms selection

- Calculation over database

OUTPUTS

- Aggregated weighted data

- Individual data

RESULTS

- Analysis by class

- Financial analysis for farmers

- Farm results comparison

Data

FADN CZ database - around 1400 farms since 2001

Czech Statistical Office
- sowing area & number of animals
- yields & quantity of production
- prices of products and inputs

Ministry of Agriculture - national aid

State Agricultural Intervention Fund - subsidies

Data estimate / forecast

Prices - **crops** - **livestock** - **products**	Institute of Agricultural Economics and Information (IAEI) Department Markets of Agricultural Commodities • Time data row analysis (monthly prices) • Linear regression,
Costs - **direct costs** - **farming overheads** - **external factors**	FADN CZ department (IAEI) • Time data row analysis (yearly) • 2001 - 2013 (2014) panel data of identical farms • Linear regression, ARIMA (autoregressive integrated moving average)
Quantity of production	Czech Statistical Office • Estimation of harvest
Subsidies	FADN CZ department (IAEI) • Estimation based on information available • Method of qualified estimate

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Bottlenecks

- Monthly price volatility affects average year commodity price

- Short time row of FADN data (costs forecast)

  3 basic models selected:

  1) time series smoothing (Fourier transform), first differentiation, ARIMA model (1,0,0) with Melard´s method to accurate estimate
  2) exponential Holt's linear alignment
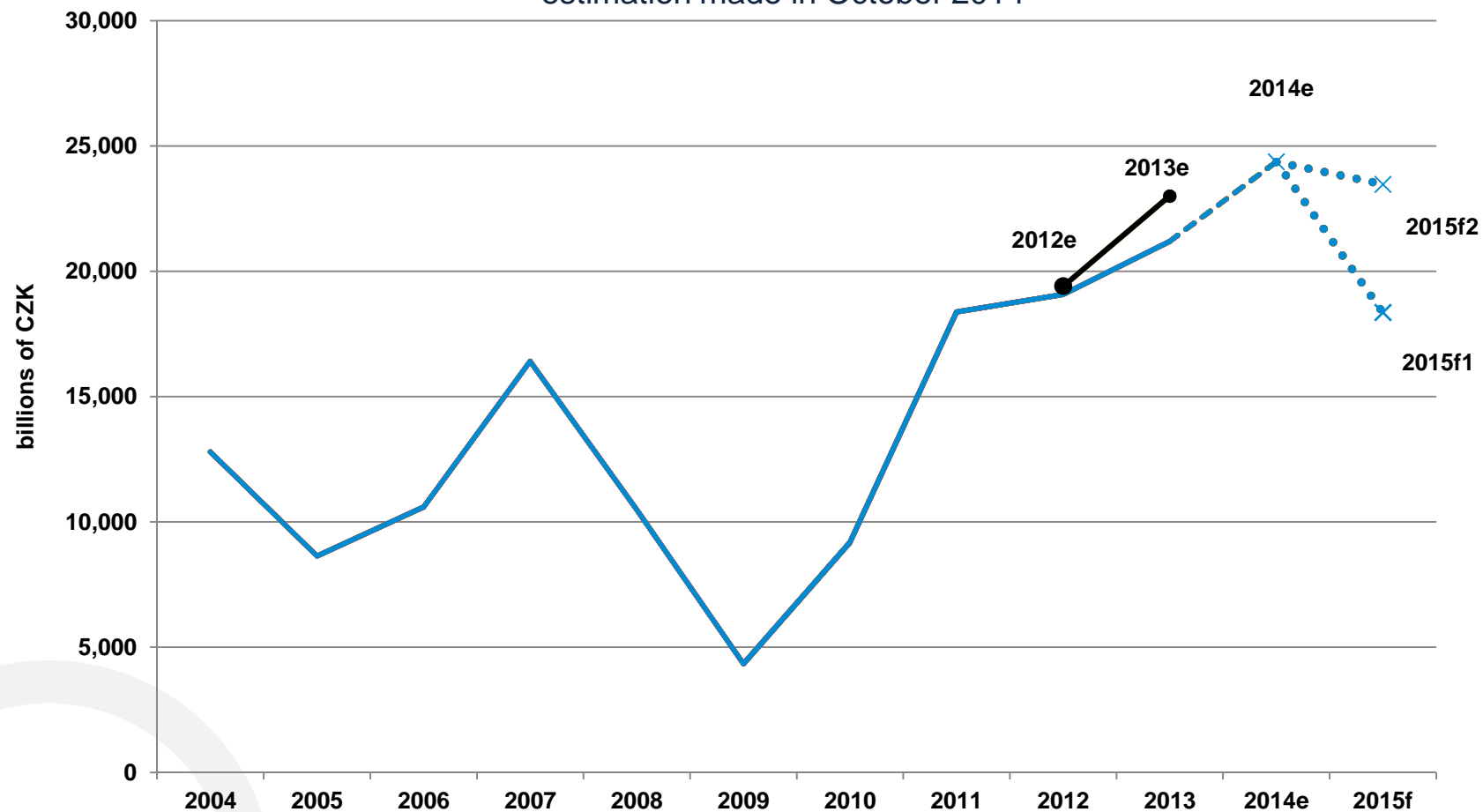 3) ARIMA model (1,1,0) with Melard´s method to accurate estimate

- Agriculture politics
  - Approved budget changes during the year based on current situation
  - Subsidy rates not know by the end of September
  - Year-on-year change in support assignment

  (problems to allocate support on farm)

- Impacts of global situation (gas price, migration, wars, climate change etc.)

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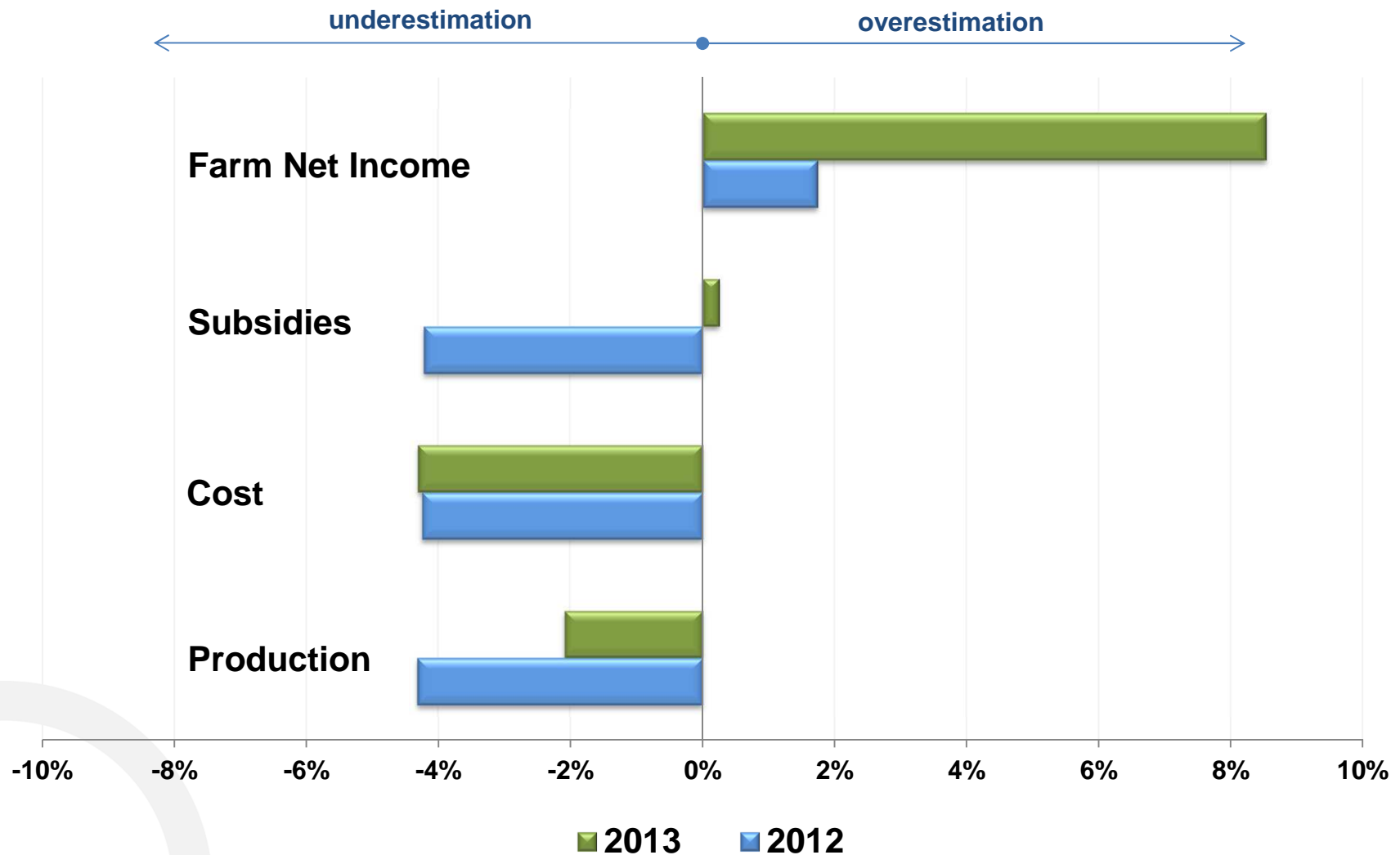
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Final outcome

Farm Net Income
estimation made in October 2014

Testing: % difference estimated vs. final results

Testing: 2012 & 2013 results comparison

Descriptive statistics

Variable	Year	N	Average	Median	Lower quartile	Upper quartile	St. deviation
Production estimate	2013	1167	19 202 732	3 424 050	1 240 052	20 093 988	40 022 618
Production final		1167	18 698 521	3 343 126	1 179 000	17 636 750	38 782 724
Costs estimate		1167	21 012 693	3 357 983	1 208 063	21 767 496	41 815 890
Costs final		1167	21 306 724	3 274 000	1 214 000	21 403 000	42 730 744
Production estimate	2012	1160	17 860 871	3 250 326	1 244 870	18 155 311	36 075 372
Production final		1160	18 827 959	3 574 340	1 296 200	20 557 500	38 291 871
Costs estimate		1160	19 642 753	3 489 062	1 188 157	22 048 648	37 280 318
Costs final		1160	20 592 556	3 716 000	1 262 000	22 136 121	40 408 874

Use of outputs

Aggregated and weighted results are targeted at **research and agro politics support**

Individual results are offered to **farmer via on-line database access**

- accessible to the farmer participating in FADN after registration

- provides basic information on farm return

- offers calculated results of advanced indicators

- enables comparison of results with average of selected group of farmers

- compiles financial evaluation of the farm management

- enables time series comparison of selected indicators

- provides estimated results of the current year (last year of harvest)

New options under development

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Conclusions

Multi-year forecast based on FADN database is feasible, but it is significantly limited by scenarios definition.

Simulation if requested.

Income estimation **at the end of harvest** is perfectly timed.

Thanks to reasonable results, it will be added among our annual outputs.

Individual access to database with option to evaluate own results + up-to-date estimate seems to be a rather strong tool offered to farmers.

Our next steps are to promote it and teach farmers to use it.

Farmers feedback is important.

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THANK YOU FOR YOUR ATTENTION

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