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Microsimulation Model Estimating Czech Farm Income from Farm Accountancy Data Network Database

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Anotace

Důchod ze zemědělské činnosti patří mezi nejdůležitější indikátory ekonomické situace zemědělských podniků a celého zemědělství. Předkládaná práce se zaměřila na zjištění optimální metody odhadu zemědělského důchodu v ČR, která se opírá o mikro-ekonomickou databázi reprezentovanou Zemědělskou účetní datovou sítí (FADN). Využití databáze FADN je odůvodněné zejména reprezentativností výsledků extrapolovaných na celou Českou republiku a možností provádění analýz na mikroekonomické úrovni. Hlavním podnětem pro zpracování studie bylo vypracování odhadu zemědělského důchodu, který je založen na metodice FADN, o tři čtvrtě roku dříve před zjištěním finálních oficiálních výsledků šetření FADN. Vlastní navržená metodika odhadu důchodu a postupy pro simulační výpočty byly úspěšně testovány s využitím databáze FADN pro dva předcházející účetní roky. Součástí tohoto článku je popis vlastního metodického přístupu k odhadu zemědělského důchodu a ověření jeho vhodnosti.

Klíčová slova

Odhad zemědělského důchodu, Zemědělská účetní datová síť FADN, aproximace produkční a nákladové složky důchodu, mikrosimulační model.

Abstract

Agricultural income is one of the most important measures of economic status of agricultural farms and the whole agricultural sector. This work is focused on finding the optimal method of estimating national agricultural income from micro-economic database managed by the Farm Accountancy Data Network (FADN). Use of FADN data base is relevant due to the representativeness of the results for the whole country and the opportunity to carry out micro-level analysis. The main motivation for this study was a first forecast of national agricultural income from FADN data undertaken 9 months before the final official FADN results were published. Our own method of estimating the income estimation and the simulation procedure were established and successfully tested on the whole database on data from two preceding years. Present paper also provides information on used method of agricultural income prediction and on tests of its suitability.

Key words

Farm income estimation, FADN, production and cost approximation, microsimulation model.

Introduction

This paper provides an overview of a new approach to micro-level farm income estimation and its components based on the Farm accountancy data network (FADN) database, using the case of the Czech Republic. The outcome of the designed microsimulation model is an estimation of economic results in agriculture about 9 months before the FADN survey for the particular accounting year is finalized. The results serve to present a complete picture of the agricultural sector, to inform the formulation of national agricultural policies, to assess the impacts of policy decisions, to design new policies and programs or to help to identify emerging trends in farming.

This kind of estimation is presented for the first time. The aim of the authors is to provide an introduction into their own methodology and its verification and to present results of the designed model.

The Council Regulation (EC) No 1217/2009 states that "the purpose of the data network shall be to collect the accountancy data needed for, in particular: (a) an annual determination of incomes on agricultural holdings coming

within the field of the survey defined in Article 5; and (b) a business analysis of agricultural holdings."

Only farms whose size (based on number of animals and utilised area) exceeds a minimal economic threshold are collected by the FADN survey. Region, economic size and type of farming are the three dimensions for which the data shall be representative. It enables to cover the most relevant part of the agricultural activity of each EU Member State. All EU Member States must follow the same rules of bookkeeping for the FADN purpose which enables to create unique fully harmonised micro-economic database (European Commission, 2013)

Farm Accountancy Data Network was set up in the Czech Republic by the decision of the Ministry of Agriculture in 2003 and the responsible body to operate the network is Liaison Agency FADN CZ is the Institute of Agricultural Economics and Information (IAEI), nevertheless the concept of the data network in the Czech Republic was launched already in 1995. Data based on EU FADN method has been collected since 2004 which allows for creating10-year panel data by the end of 2014.

FADN CZ database, submitted to the European Commission, consists of about 1422 farms in 2011 and 1369 farms in 2012 (Hanibal et al. 2012, 2013). The reported results are processed from the full dataset submitted to the European Commission.

There are numerous means used to describe development in agriculture. One of them is the set of indicators called Standard Results which define structural and economic conditions on the farms. The variables of Standard Results were established by the European Commission and a precise definition is provided in document RI/CC 882. One of the key Standard Results measures evaluating economic results of the farms via agricultural income is Farm Net Value Added (FNVA) and Farm Net Income (FNI).

Farm net value added is equal to total production plus balance current subsidies and taxes minus total intermediate consumption and minus costs of depreciation. FNVA is remunerating work, land and capital (paid or own fixed factors) allowing comparison of the farms no matter whether the production factors are coming of family or non-family sources (European Commission, 2013). FNVA is the indicator enabling to compare economic results of family farms using mainly own labour and land to the legal entities such as agricultural holdings who don't own but rent the majority of utilized land and use paid labour (as is typical in the Czech Republic). FNVA is considered as the key economic indicator allowing to measure level of income and production efficiency of farmers not only in national conditions but also at the EU level (Hanibal et al., 2013).

Farm net income is equal to FNVA plus balance subsidies and taxes on investment minus total external factors (wages, rent and interest paid). FNI is in the context of the present study considered as a final indicator which in its aggregated form represents national agricultural income. FNI stands for the final economic indicator measuring profit or loss coming from agricultural activities of farms. It includes also unpaid work remuneration of family unpaid farmers (Hanibal et al., 2013).

Farm income is justly taken into consideration for discussions on policy forming and evaluating at it is an essential indicator providing evidence on the viability of the agricultural sector.

Many other significant indicators are likewise estimated as separate components of the final indicators. These include value of production, costs, and subsidies defined by the indicators calculated according to EU FADN methodology.

"The Community typology needs to be so arranged that homogeneous groups of holdings can be assembled in a greater or lesser degree of aggregation and that comparisons of the situation of holdings can be made" as stated by Commission Regulation (EC) No 1242/2008 (2008). The significant benefit of FADN database is the possibility to carry out analysis on the micro level, to analyse specific fields of interests (LFA, type of farming etc.) and to apply microsimulation methods.

Agriculture has its own specifics, which needs to be taken into consideration not only for modelling (Allen, 1994) but for all types of analysing. Quantity and quality of the production is determined mainly by local circumstances and natural conditions. Prices more depend on the global situation and government decisions. Agriculture is subject of protectionism (Moon, 2011) which is determining both the quantity and prices of production, but has also impact on farm income and management.

Using the microsimulation model in this study we can answer the question how the economic result of the national agriculture will evolve taking into consideration basic assumptions in the analogous sense as indicate Li, O'Donoghue (2013).

Ballas, Clarke, Wiemers (2005) declared that it

was proved that it is worth to use microsimulation models to evaluate the impact of policy changes at the micro-level and they underlined the power of the models to create large-scale data sets of micro units characteristics.

Among other appreciated advantages of microsimulation models is an opportunity to link data with many other source databases, advantageous data storing in form of a list, and the possibility to update models or to project data (Ballas, Clarke, Wiemers, 2005, 2006).

Analogous work to ours was also conducted for Canada. The Canadian Agricultural Dynamic Microsimulation Model (CADMS) is created and operated by Agriculture and Agri-Food Canada. CADMS delivers forecasts regarding farm-level revenues, expenses and program payments for individual agricultural companies. The results of CADMS moreover allow providing farm income outlook in more disaggregated form (e. g. type of farming) which is appreciated value added of the model. (Galbraith, Bakhshi, Kung, Kjaer, 2011).

Macroeconomic outcome of national agricultural and entrepreneurial income is provided by the Czech Statistical Office through the Economic Accounts of Agriculture. Other macroeconomic sources of information and forecasts of agricultural income in Europe are published by Outlook of OECD-FAO (2013) and Prospects of the European Commission (2013).

Materials and methods

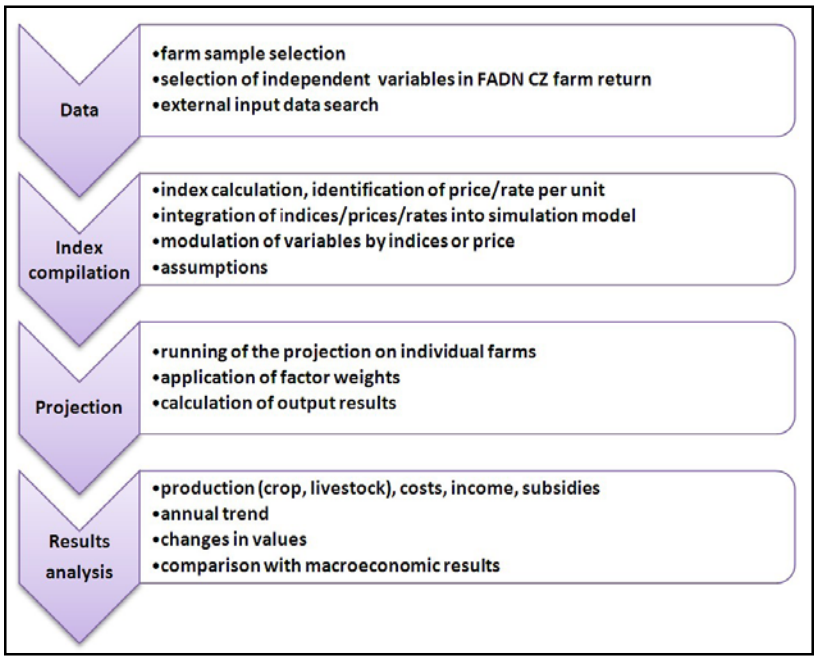
Using the FADN database it is possible to analyse particular features of farming the researcher is interested in, or aggregated weighted data representing whole country. In this study both of these benefits of the FADN database were applied. Firstly the set of independent indicators on the farm level was adjusted by the computed year-on-year indices and secondly the results of the estimated farm sample were weighted and aggregated to give an overview of economic conditions in Czech agriculture.

The investigation also includes an examination of potential sources of input information on production, costs and subsidies components.

Year-on-year unchanged production structure was assumed and depreciation level was taken into account for this estimation.

The software FADN CZ Projection was used for modelling. This application is an essential tool for estimating economic results on the individual level of the FADN CZ database.

Process of the estimation itself can be separated into 4 stages (Figure 1).



Source: own processing

Figure 1: Procedure of the estimation process.

At the beginning, variables to be changed are to be identified. The next step is to define the changes and indices composition. Thereafter a recalculation of the simulated dataset is completed and standard results are calculated. At the end, estimated data are weighted and aggregated to the national level.

National database of FADN survey is used as data source for the presented work. Czech FADN farm return differs from the EU FADN format in the greater detail of information obtained. Detailed records of FADN CZ database allow the combination of input information from various appropriate sources, leading to more accurate results of the estimation. For instance, FADN CZ collects information on livestock daily weight gain or more categories of crops, so important crops such as spring and winter wheat, or spring and winter barley, are differentiated.

The basic items of the individual FADN farm returns are to be recalculated by the year-on-year change measure. Every single index is used to estimate new item of the farm return for each farm in the selection of the representative sample. The items of the farm returns which are not considered to be changed remain at the same level as in the source year. The most up-to-date accounting year dataset in FADN database is used for the one-year projection.

Identification of the variables from FADN database intended to be changed was based on the knowledge of the income components and significance of individual indicators. To confirm variables selection and to avoid omission of significant variables, a statistical method (Meloun, 2004, 2006) was used to measure the dependence of individual variables on the whole subdivisions (production, costs, and subsidies). The statistical program SPSS 16.0 was used for an analysis of correlation. On the empirical and statistical basis, 354 items were selected for adjustment (of which 264 for changes in the crop production, 70 for changes in the livestock production, 20 variables for agricultural products and 26 items for the costs). The extent of the selected variables can be updated for the actually estimated year such as the set of subsidies which are to be updated yearly.

The estimation of **the crop balance sheet** variables is achieved by using the compound indices for the selected individual items.

Opening valuation:

$$IOv = \frac{\sum_{i=1}^{n} KZ_{N-1,i}}{\sum_{i=1}^{n} PZ_{N-1,i}} \cdot \frac{\overline{CZ}_{N-1}}{\overline{CZ}_{N-2}}, \quad (1)$$

where CZ is an average price of agricultural producers in September of year N-1 and N-2, KZ is the closing valuation of the inventory (in tons), and PZ is the opening valuation of the inventories (in tons) in FADN database in year N-1.

Value of farm use of seeds:

$$IFUs = \frac{\sum_{i=1}^{n} O_{N,i}}{\sum_{i=1}^{n} O_{N-1,i}} \cdot \frac{\bar{C}_N}{\bar{C}_{N-1}}, \quad (2)$$

where O is sowing area and C is an average year price of agricultural producers in the estimated year N and previous year N-1.

Value of farm use of feed:

$$IFUf = \frac{\bar{C}_N}{\bar{C}_{N-1}}, \quad (3)$$

where C is an average year price of agricultural producers in the estimated year N and previous year N-1.

Sales in market price:

$$ISA = \frac{\sum_{i=1}^{n} P_{N,i}}{\sum_{i=1}^{n} P_{N-1,i}} \cdot \frac{\bar{C}_N}{\bar{C}_{N-1}}, \quad (4)$$

where P is the quantity of the harvested crop production and C is the average year price of agricultural producers in the estimated year N and previous year N-1.

Transmission to own processing:

$$IOP = \frac{\bar{C}_N}{\bar{C}_{N-1}}, \quad (5)$$

where C is an average year price of agricultural producers in the estimated year N and previous year N-1.

Own consumption:

$$IOC = \frac{\bar{C}_N}{\bar{C}_{N-1}}, \quad (6)$$

where C is the average year price of agricultural producers in the estimated year N and previous year N-1.

Closing valuation:

$$ICV = \frac{\bar{C}_N}{\bar{C}_{N-1}}, \quad (7)$$

where C is the average year price of agricultural producers in the estimated year N and previous year N-1.

Edited value indicators for a change in **livestock production** are as follows: opening valuation, purchase of animals, sale of animals at market price, transmission to own processing, own consumption, closing valuation.

In the frame of livestock estimation the following composite index is used:

$$I = \frac{\bar{C}_N}{\bar{C}_{N-1}} \cdot \frac{\sum_{i=1}^{n} PO_{N,i}}{\sum_{i=1}^{n} PO_{N-1,i}}, \quad (8)$$

where C is the average price of agricultural producers and PO is number of animas on 1st April in the estimated year N and previous year N-1.

Among **processed products** from livestock production are cow milk and milk products, eggs and honey. For those, change in market price was used as a basic value indicator and then, depending on individual case, also change in opening valuation of stocks, intermediate consumption - feed (in thousands CZK), own consumption and the closing valuation.

$$\textit{Index milk} \quad Iml = \frac{\sum_{i=1}^{n} HN_{N,i}}{\sum_{i=1}^{n} HN_{N-1,i}}, \quad (9)$$

where HN is the value of purchased milk in year N and N-1.

$$\textit{Index honey} \quad Imd = \frac{\overline{CS}_N}{\overline{CS}_{N-1}} \cdot \frac{\sum_{i=1}^{n} P_{N,i}}{\sum_{i=1}^{n} P_{N-1,i}}, \quad (10)$$

where CS means consumers price and P is quantity of production in year N and N-1.

$$\textit{Index eggs} \; Iv = \frac{\bar{C}_N}{\bar{C}_{N-1}} \cdot \frac{\sum_{i=1}^{n} P_{N,i}}{\sum_{i=1}^{n} P_{N-1,i}}, \quad (11)$$

where C is average producer´s price and P is quantity of production in year N and N-1.

On the cost side are adjusted direct costs (as purchased and own seeds and seedlings, fertilizers, crop protection products, purchased and own feedings, medicines and veterinary equipment) and farming overheads (as machinery and building current costs, fuel and lubricants, electricity, other energy, contract work, breeding and veterinary services, personal expenses, insurance.

List of presented items can be expanded or reduced for different versions of the estimate, depending on availability of information on year-on-year development of costs.

$$\textit{Personal expenses index} \; Ion = \frac{\bar{M}_N}{\bar{M}_{N-1}} \cdot \frac{\overline{PO}_N}{\overline{PO}_{N-1}}, \quad (12)$$

where M is average wage in agriculture and PO refers to average number of employees in agriculture for year N and N-1.

Other cost items are adjusted based on the available input information from the report ‚Input agricultural price indices' issued by the Czech Statistical Office.

The last part of the income composition is the area of subsidies. One-year estimate of income crucially relies on identification of rates for individual subsidies and on information about the total allocated and disbursed grants in the estimated year. Since the calculation is made at the end of the estimated year, majority of this information is usually known.

The subsidies rates are applied to the quantity of the units registered in FADN farm return in year N-1. The index is applied for the calculation of the year-on-year change of the subsidies where the units are not monitored. Whenever only total subsidy amounts are known, the total amount is added into the calculation subsequently. In such cases the detailed classification analyses are conditioned by the additional estimation of the subsidies distribution. The procedure for determining the estimated subsidies shall be annually reviewed and adapted to the current situation of the year.

Identified external sources were used as input information for composing the compound indices. The main information source is the Czech Statistical Office which provides particularly on-line public datasets ‚Input agricultural price indices (corresponding period of previous year = 100)', ‚Average quarterly prices of selected products and services sold to agriculture', ‚The average monthly prices of agricultural products', ‚Livestock as of April 1st', ‚Estimated harvest of selected agricultural crops', ‚Information on estimate of yield and production of agricultural crops in the Czech Republic as of 15 September', ‚Harvest of agricultural crops' and ‚Trend in sowing areas: 31 May'. The commodity portal of the Czech Ministry of Agriculture was used to gather information on eggs and milk production.

Results and discussion

Estimation of 2013 results and verification of the model by 2011 and 2012 results testing is provided based on above methodology.

Estimation of agricultural income in 2013

The first estimate of the outcome of agricultural income in 2013, based on microeconomic data was processed according to the methodology described

above. At the time of the calculation, agricultural producer prices for the period from January to November 2013 and annual changes in major cost items for the first three quarters of 2013 were known from external sources. Estimation of subsidies was prepared on the basis of announced and anticipated rates by the Ministry of Agriculture for year 2013.

The farmers achieve good economic results as the estimate indicates year-on-year increase of the Farm net income, considered as a final economic indicator, by 4.2 %. The estimated value of 19.77 billion CZK for 2013 is the best result of farm income during the last 10 years (Figure 2).

The other key indicator Farm net value added increased by 2.4%.

Total production shows also an increasing trend, which leads to growth of 3.7 % to 130.57 billion CZK. The most important factor in this increase is crop production, whose value increased by 4.7 % mainly due to an increase in the value production of potatoes and oil crops (rape). Livestock production improved by 3.2 %, the increase was particularly found in milk production, pork and poultry meat production. Results of beef production are the same as in the previous year and egg production occurs noticeable declining in 2013.

Total expenses grow by 3 % to 143.48 billion CZK, primarily due to a significant increase in the price of feed and seeds.

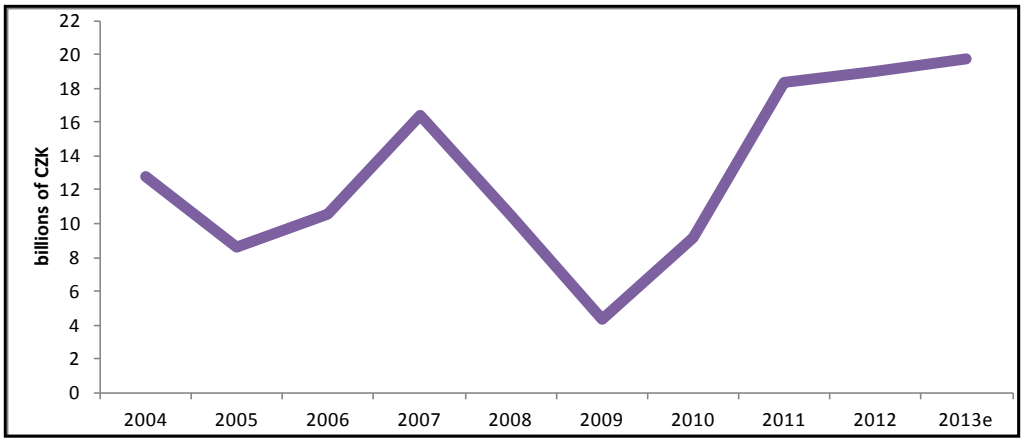
Subsidies, as was expected, increased modestly by 0.7 % to 31 billion CZK.

Estimates of economic results presented in a more detailed breakdown are displayed in Table 1.

Main indicators	2012	2013e	% Change
Total output	125.86	130.57	3.7
Crop production	69.83	73.13	4.7
- cereals	33.31	33.77	1.4
- oil-seed crops	13.66	14.64	7.2
- vegetables	3.89	4.09	5.3
- fruit	1.15	1.3	12.5
Livestock production	44.5	45.92	3.2
- milk and milk products	21.48	22.68	5.6
- beef	8.35	8.25	-1.3
- pigmeat	7.54	7.92	5.1
- poultrymeat	4.58	4.89	6.8
- eggs	1.81	1.44	-20.6
Total costs	139.35	143.48	3
Intermediate consumption	93.62	97.39	4
Specific costs	52.94	56.21	6.2
- seed and plants	6.4	6.74	5.4
- fertilisers	8.66	8.81	1.7
- crop protection	7.31	7.47	2.3
- feed	24.24	26.8	10.6
Farming overheads	40.69	41.18	1.2
External factors	31.91	32.27	1.2
Subsidies (ex. on investments)	30.81	31.03	0.7
Gross farm income	62.29	63.46	1.9
Farm net value added	48.47	49.64	2.4
Farm net income	18.97	19.77	4.2

Note: 2013e – estimated results
Source: FADN CZ, own processing

Table 1: Breakdown of the estimated economic results for 2013 compared to 2012 final FADN results in billions of CZK.



Source: FADN CZ, own processing

Figure 2: Farm net income development since 2004, based on FADN CZ in billions of CZK.

Estimation accuracy – aggregated results

The whole suggested methodology was verified by empirical testing it (Armstrong, 2006) on two previous years where the estimated results could be compared to the actual final FADN results. Verification was carried out in the form of processing farm economic results estimate for 2011 based on FADN 2010 data and 2012 estimates based on FADN 2011 data. For the purpose of good quality verification of the system, two different periods of input information were used for the calculation. Input information available up to April 2013 was used for estimating 2012 results and the estimate of 2011 was based on external data available in January 2012.

The estimated values were compared with the actual results of the official FADN survey for this period.

The estimated Farm net income was 20.04 billion CZK in 2011, which is close to the official result of 19.13 billion CZK with just 4.7% difference. Estimation of overall production was almost 100% in line with actual results, see Table 2.

Farm net income was estimated at the level of 17.82 billion CZK in 2012. The final result of the FADN CZ survey calculates it at 18.97 billion CZK. The difference between the estimated and the official result is 6.1%. The difference was mainly due to higher estimated costs, though it can also be partly explained by a change in the weighting method. For the official results the most recent Farm structure survey 2010 was used, while the estimation results have been processed before this upgrade using weights based on Farm structure survey 2007.

Among other indicators involved in the income composition we can mention Farm net value added with a deviation of only 1.2%, the total production (4.8%), operating subsidies (5.0%) and the total cost (6.95%).

The common partial explanation of the variance between actual and projected results is the use of weighting factors for estimated result from the previous year because the weights of the actual year were not known at the time of simulation.

Estimation accuracy - cumulative distribution

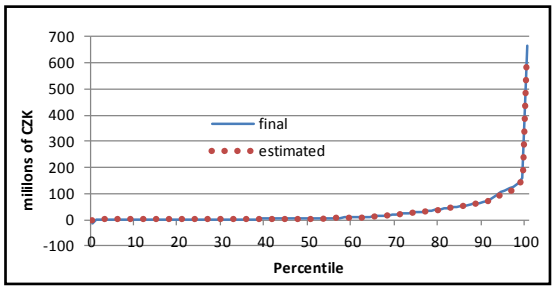
Accuracy of estimation is also confirmed by the comparison of the cumulative distribution (Galbraith, Bakhshi, Kung, Kjaer, 2011) of the chosen indicators with the final FADN results for both tested years in the Czech Republic. The following set of graphs gives evidence of equivalent distribution of estimated indicators and it confirms good performance of the model and method used.

Graphs 3-6, showing comparison of the distribution of 1266 farms in 2012 based on four variables (Total output, Total costs, Farm net value added, Farm net income), prove the proper distribution of the estimated curves for all variables.

Accounting year	2011	2011e	%	2012	2012e	%
Source	FADN final	Estimate FADN	Change	FADN final	Estimate FADN	Change
Date of processing	October 2012	January 2012		November 2013	April 2013	
Farm net income	**19.13**	**20.04**	**4.74**	**18.97**	**17.82**	**-6.08**
Gross farm income	62.44	62.7	0.42	62.29	61.81	-0.78
Farm net value added	48.52	49.94	2.92	48.47	47.88	-1.2
Total output	129.53	129.45	-0.06	125.82	131.84	4.78
Subsidies (ex. on investments)	30.91	29.14	-5.73	30.81	32.35	5.02
Total costs	143.93	137.99	-4.13	139.31	149	6.95
Specific costs	54.78	55.92	2.08	52.9	57.86	9.38
Farming overheads	42.42	39.1	-7.83	40.68	43.72	7.47
External factors	32.81	30.21	-7.93	31.91	33.49	4.97

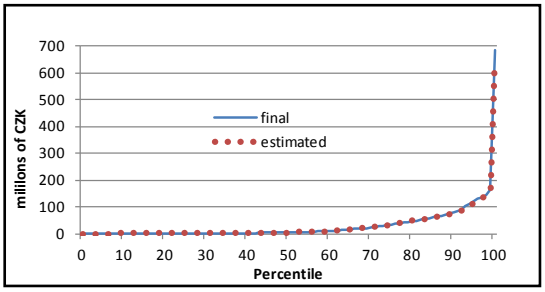
Note: 2011e, 2012e – estimated results
Source: FADN CZ, own processing

Table 2: Comparison of estimated results for 2011 and 2012 to final FADN results (billions of CZK)



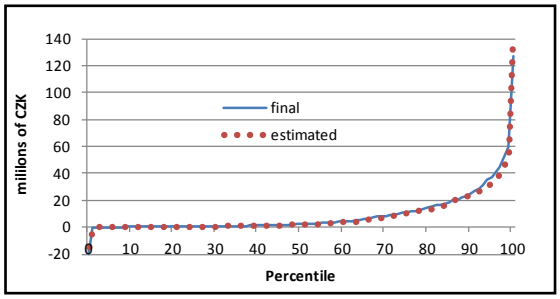
Source: FADN CZ, own processing

Figure 3: Final versus estimated Total output, FADN CZ 2012.



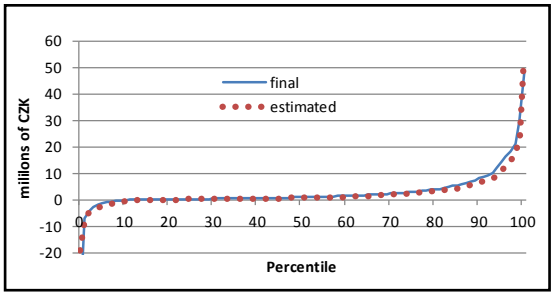
Source: FADN CZ, own processing

Figure 4: Final versus estimated Total costs, FADN CZ 2012.



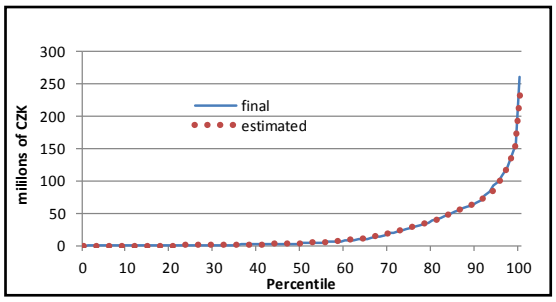
Source: FADN CZ, own processing

Figure 5: Final versus estimated Farm net value added, FADN CZ 2012.



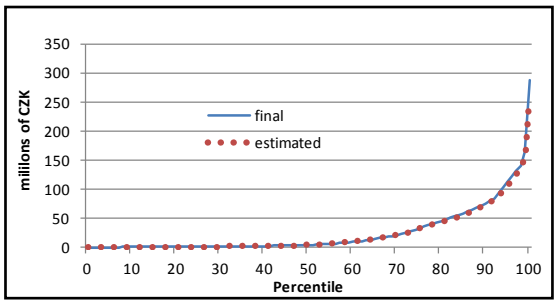
Source: FADN CZ, own processing

Figure 6: Final versus estimated Farm net income, FADN CZ 2012.



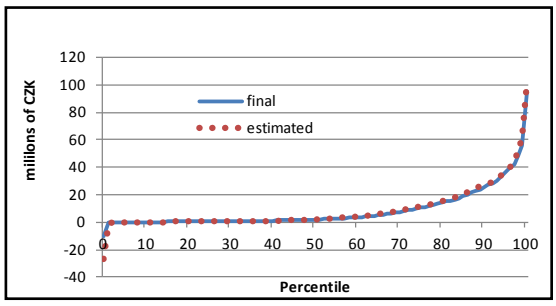
Source: FADN CZ, own processing

Figure 7: Final versus estimated Total output, FADN CZ 2011.



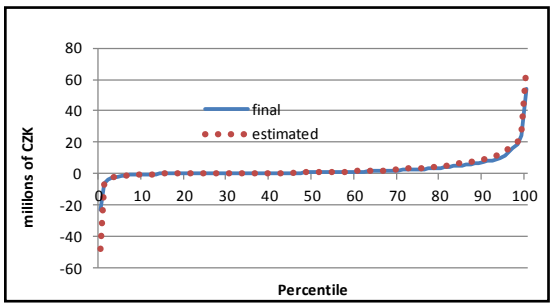
Source: FADN CZ, own processing

Figure 8: Final versus estimated Total costs, FADN CZ 2011.



Source: FADN CZ, own processing

Figure 9: Final versus estimated Farm net value added, FADN CZ 2011.



Source: FADN CZ, own processing

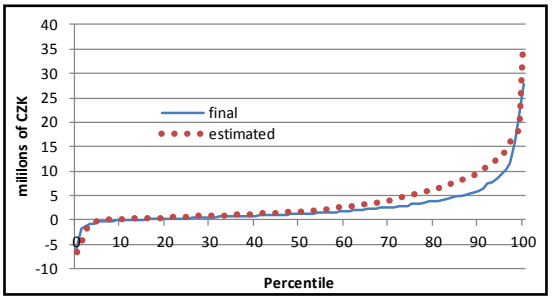
Figure 10: Final versus estimated Farm net income, FADN CZ 2011.

The following graphs 7-10 demonstrate overall cumulative comparison of distribution for the chosen indicators of 1323 farms in 2011. Even in this testing period we can notice very

tight shapes between both estimated and actual curves indicating proper method was used for the projection.

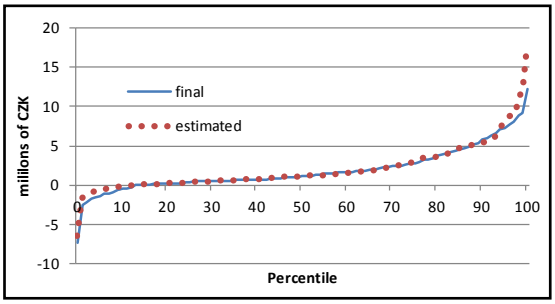
The amounts of production and costs were slightly underestimated for very large agricultural holdings as it can also be noticed in results for 2012. On the other hand Farm net income was overestimated for farms with very poor economic results. This under and over estimation can be explained by changes in farm structure, year-on-year improvement of management of farms or large volatility of prices during the estimated year.

The graphs 11-14 provide an overview of the distribution of Farm net income for the selected types of farming (386 specialists' field crops farms, 136 specialists' dairying farms, 152 grazing livestock – rearing and fattening farms and 421 mixed farms) for actual and projected results for the accounting year 2011. Farm net income for mixed farms and grazing livestock farms was projected with very good results what is confirmed by almost identical shapes of compared curves. The overestimation resulted for dairy farms with large FNI. Apparently the FNI rises less sharply for estimated results of field crops farms. The reasons of the differences are equivalent to those mentioned above.



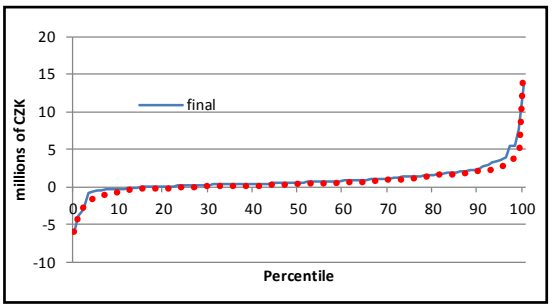
Source: FADN CZ, own processing

Figure 11: Final versus estimated FNI, Specialists' field crops farms, FADN CZ 2011.



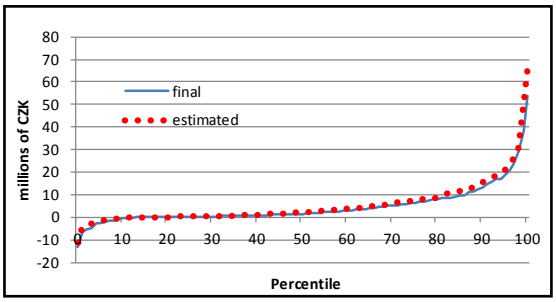
Source: FADN CZ, own processing

Figure 12: Final versus estimated FNI, Specialists' dairying farms, FADN CZ 2011.



Source: FADN CZ, own processing

Figure 13: Final versus estimated FNI, Grazing livestock – rearing and fattening farms, FADN CZ 2011.



Source: FADN CZ, own processing

Figure 14: Final versus estimated FNI, Mixed farms, FADN CZ 2011.

Conclusion

All results produced under the described method are presented in the form of estimates, which carry some risk of distortion or deviation from actual state. Accurate estimate is subject to many external factors that cannot be completely controlled. These are mainly due to extreme weather, high volatility of producer prices or year-on-year structural changes on farms. Also annual change of weighting factors might have some impact on the extrapolated results. First estimate, made in December of the estimated year, may be distorted by missing input information for the fourth quarter of the year, which naturally cannot be available at the time of calculation.

Using the modest techniques of index adjustments of microeconomic data for one-year income estimate does not cause significant impact on the distortion of the results.

Natural factors and the short-term decisions resulting from agricultural policy of the Czech Republic and the EU have an impact on both the production and economic results, which cannot always be predicted impeccably. Nevertheless, taking into account confirmation of the model by comparison of the estimated and final results,

the indicated risk of the distortion can be considered as acceptable.

Taking into account the evidence presented in this paper it can be concluded that the designed model and the methods used for the one year projection of the farm economic results based on FADN database work accordingly and the results can be considered as a usable contribution for the further analyses.

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