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## **Living conditions of Czech farmers according to EU statistics on income**

Ladislav Stejskal, Jana Stávková

### **Abstract**

The article deals with the assessment of income situation of the Czech households with the head person working or self-employed in the farm sector. Actual analyses result from initial consideration of the rise and dynamics of income disparities in our country. Primary data source are obtained from the European Union survey project - Statistics on Income and Living Conditions (EU-SILC). Our reference period, in view of data availability at the time of the article processing, is represented by the 2007 year. The core studied variable is represented by the volume of the income calculated for each household. The information obtained by study of this variable was complemented by other variables enabling the logical validity check and analysis of the socioeconomic environment of households under examination.

Main findings and conclusions are derived from the analysis of the decile and quintile classification of the relevant equivalized income data. The prime goal of the study was to quantify the share of the Czech agriculture related households living on the monthly income less than 60 % of the nationwide median value of the income variable under consideration. The households identified with such income position are referred as “households-at-risk-of-income poverty“. Results are calculated per physical household member, which authors found more illustrative and easy to understand. Household size equalization procedures according to the EU and OECD methodology will follow. This will enable the international comparison of the achieved results with those for other countries.

### **Keywords**

EU-SILC, farm households, income per person, income disparities, income situation, income poverty

## Introduction

Expected and also dreaded phenomenon by Czech population - marked deepening of income and property differentiation appeared as the transition to the market economy started. The reason was this process encompassed leaving of mechanisms of control and avoidance of formation of income disparities, whether by private enterprise deregulation, entry of foreign companies or legislative changes.

The criteria for definition and analysis of differences and inequalities can be of various demographic and sociological aspects, as presented, for instance, by Stávková et al (2008). In the article authors focus on the agricultural sector, accordingly they proceed from the society segmentation according to primary source of household incomes.

While the post-communist EU countries, in comparison with the other EU member countries, show generally flatness of in their income distribution functions, their property differentiations (understood in broad sense) grow over time and are more and more evident even without a deeper investigation. Interpretation of past development and its impact is at the same time very important and also politically sensitive matter.

Income and property inequality are admittedly, on one hand, natural characteristics of the healthy functioning society. However, if the degree of the inequality reaches a certain “extreme limit“, it becomes an essential obstacle to internal development and international competitiveness. The examples, according to Kohout (2005), could be found in African and Latin American countries, characterized by very high income disparities<sup>1</sup>.

Gradual break-up of income leveling in our country impacts very intensely especially the households, head members of which work, whether as employees or self-employed persons, in agricultural sector. For instance, the report of the Agricultural Association of the Czech Republic (Zemědělský svaz České republiky) states that “in connection with climatic changes and extreme price fluctuations, incomes of farmers are deep below other sectors<sup>2</sup>“. In connection

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<sup>1</sup> Income inequality expressed by a standard difference of income quantiles amounts in most of these countries to more than 25 percent, whereas average values, typical of developed European countries, Japan or USA, range about 15 percent.

<sup>2</sup> Published on 25 March 2010, available at [http://www.zscr.cz/aktuality/1/vystoupeni-predsedy-zs-cr-miroslava-jirovskeho-na-a1517101/?discussion\\_add\\_new\\_post=1](http://www.zscr.cz/aktuality/1/vystoupeni-predsedy-zs-cr-miroslava-jirovskeho-na-a1517101/?discussion_add_new_post=1); cited 11th April 2010

with the wording and proposed changes in first two pillars of the EU Joint Agricultural Policy for the 2013 year, the Czech agriculture is directly defined as “the sector at risk of income poverty“.

Connection of the analysis of income disparities with segmentation according the sector classification, in which the incomes are generated and with focus on the agrarian sector is the main research topic of this publication. In addition to validation of aforesaid claims, it will be used primarily as a way-out of other research works, which perhaps will contribute to improvement of the existing situation in future.

### **Material and methods**

The Czech Statistical Office (Český statistický úřad) is entrusted by law to monitor the income indicators. For these purposes the Statistics of Family Accounts carrying information on living standard of households according the particular population groups are processed. This enquiry is an extremely valuable source of information but presently it's not sufficient. The reason is higher requirements of the European Statistical System for the data quality (especially with respect to timeliness, accuracy and availability),.

The actual tool, implementing a new methodology of reference data acquisition for income analysis at the EU level, is the project initiated by the Directive of the European Parliament and Council (EC) No. 1177/2003 of 16 June 2003 on statistics of the European Community in area of incomes and living conditions (European Union - Statistics on Income and Living Conditions, abbreviated EU-SILC). In 2003-2005, EU-SILC was gradually initiated in all EU member countries and became the data source for the analysis of income distribution and social integration at the EU level.

The project is based on the Regulation of the European Parliament and Council No. 50/2002/EC implementing the action program of the Association for support of cooperation of member countries in their fight against the social exclusion. Concretely, in action 1.2 area 1, concerning “the analysis of social exclusion“, according to which the conditions for financing of measures related to collection and publication of comparable statistics and especially improvement in the

quality of survey and analysis of poverty and social exclusion are necessary<sup>3</sup>.

Primary source of data on income distribution in our country will be the data from national module of the EU-SILC project for the last available period, which presently means the 2007 year<sup>4</sup>.

The statistical survey EU-SILC was carried out in all Czech regions. The surveyed unit was a household and consequently all persons living at the time of survey under the same household structure. Sampling plan was based on the two-stage random selection independently for each region so that the total number of selected households would be proportional to size of particular regions. At the first level, the so-called survey districts were selected randomly, from which ten households were subsequently selected. Total number of households selected for the survey included almost ten thousand units<sup>5</sup>.

The core studied variable is the volume of the average income per person. The further variables enabling the logical validation and analysis of the given socioeconomic environment of units under examination were subsequently added.

The key studied characteristics and their symbols are the following:

- A Household identification
  - A1 Household type
  - A2 Data on members
  - A3 Social characteristics
- B Disposable income
- C Number of physical members
- D Recounted number of members

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<sup>3</sup> Note. Initial standard that defines basic concepts and with which the elaboration of all particular statistics of the Community complies, is the Council Regulation (EC) No. 322/97 on statistics of the Community.

<sup>4</sup> Next to the EU-SILC three other data sources are used **for statistics on Agricultural Household Incomes in EU Countries: Farm accounts surveys** that in some countries collect data on household income, which is in addition to the requirements of the FADN/RICA system that is only concerned with the agricultural holding. **Household budget surveys**, though again the numbers of agricultural cases where farming is the main source of income are too small in these general surveys, the quality of the data on self-employment may not be high, and data relate to the household unit (which is the dwelling rather than the single budget unit) and generally not to individuals within it. **Taxation records and income statistics registers based on them.** Though potentially covering all households, or samples of them, these are only developed as a data source for income studies (as opposed to taxation issues) in a few Member States. In others there may be legal barriers to their use as a basis for statistics.

<sup>5</sup> Methodology of data collection is described in details by Kabát (2007).

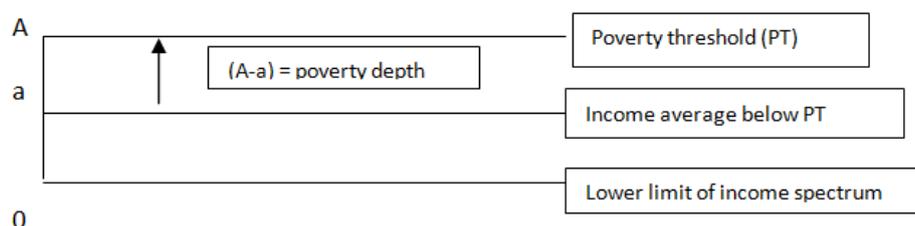
## E Average income per one member

The A identification represents the number, through which the simple arrangement and check of primary data from different user positions can be performed. The A1, A2 and A3 indicators enable a deeper and more detailed analysis of the collected data set. Data concerning the disposable income of households are reported under the EU-SILC project for the entire previous year, which is represented by the B indicator. For purposes of further analysis, the disposable income per one month was recalculated too. The C indicator expresses the count of all members of the household. The D recounted number of household members is acquired with the EU and the OECD methodology.

The average monthly income per one household member is subsequently acquired according to the formula  $E = B / C / 12$ . Value of the variable of average monthly income is used to determine the number of the so-called “households-at-risk-of-income-poverty” – in accordance with the Eurostat methodology, the threshold of income at risk or poverty risk is the 60 % of income median.

Last but not least, the so-called poverty depth, accordingly the income deficit of the at-risk-of-poverty for individual households was calculated. Structure diagram is presented in the Figure No. 1, the poverty depth indicator is the (A-a) value. The value represents the theoretical amount of the additional income needed to get the household above the poverty line.

Figure No. 1: Structure diagram of poverty depth indicator



Source: Kabát, 2007

The quintile classification of the set of respondents was used to specify income differentiation. For this purpose we used the ratio of the disposable income of the top 20 % of households against the income value calculated for the bottom 20 % of households. The general overview of the

income situation within the entire set of studied households and its inequality parameter is calculated by Gini coefficient, which is the numerical characteristics of the income diversification, used frequently for these studies. The Gini coefficient is calculated according to the following formula:

$$G = \left| 1 - \sum_{k=0}^{k=n-1} (X_{k+1} - X_k)(Y_{k+1} + Y_k) \right|$$

where  $X_k$  and  $Y_k$  represent accumulated quantities for the population and income variable. The Gini values can lie in the interval from 0 to 1 when the 0 value represents the ideal, uniform distribution of incomes, on the contrary the 1 value is an extreme example of the zero diversification, accordingly of the acquisition of all incomes by only one subject.

## Results and discussion

The Czech national module of EU-SILC of the 2007 year contains 9 675 surveyed households. Geographical structure of the set of respondents results from the stratification methodology of collecting and processing the EU SILC data. Regional allocation of the surveyed households is presented in Table No. 1.

Table No. 1: Regional structure of respondents of EU-SILC 2007

Region	Absolute rate	Relative rate
South Bohemian Region (Jihočeský kraj)	612	6.3 %
South Moravian Region (Jihomoravský kraj)	948	9.8 %
Carlsbad Region (Karlovarský kraj)	328	3.4 %
Hradec Králové Region (Královéhradecký kraj)	513	5.3 %
Liberec Region (Liberecký kraj)	391	4.0 %
Moravian-Silesian Region (Moravskoslezský kraj)	1 399	14.5 %
Olomouc Region (Olomoucký kraj)	666	6.9 %
Pardubice Region (Pardubický kraj)	513	5.3 %
Pilsner Region (Plzeňský kraj)	562	5.8 %
Prague (Praha)	864	8.9 %
Central Bohemian Region (Středočeský kraj)	1 006	10.4 %
Ústí Region (Ústecký kraj)	787	8.1 %
Vysočina Region (Vysočina)	510	5.3 %
Zlín Region (Zlínský kraj)	576	6.0 %
Total	9 675	100.0 %

Source: EU-SILC, modified

Each head person of the household was assigned to one of nine social groups. Social structure of the set is recorded in Table No. 2.

Table No. 2: Distribution of social groups in EU-SILC 2007

Social group of the leading personality of the household	Absolute rate	Relative rate
1 - lower employee	2 385	24.7 %
2 - self-employed	802	8.3 %
3 - higher employee	2 279	23.6 %
6 - pensioner in household with EA* members	418	4.3 %
7 - pensioner in household without EA members	3 423	35.4 %
8 - unemployed	258	2.7 %
9 - others	110	1.1 %
Total	9 675	100.0 %

\* economically active

Source: EU-SILC, modified

Group of pensioner households without economically active members is the most numerous. Data segmentation according to criterion of economic activity or inactivity of the head member results in reduction of the number of social groups by joining the groups 1 – lower employee, 2 – self-employed person, 3 – higher employee and 4 – pensioner in the household with economically active members. This aggregated group is entitled by authors as “working“. Modified share of social groups is then shown in Chart No. 1.

Chart No. 1: Distribution of social groups with aggregation of economically active households



Source: EU-SILC, own calculation

The group of surveyed units marked as “working“ is numerically the highest – it makes up 60.9 % of total number of surveyed households. Given that the paper deals further with income situation of households, it is interesting to mention that disposable income of this aggregated group represents only 56.1 % of total disposable incomes found in survey. This is an argument supporting our hypothesis on significance of social transfers and income redistribution in society<sup>6</sup>.

### **Farmers households**

Main focus of the research was concentrated on analysis of disposable income and living conditions of households of Czech farmers. From aforesaid summary data, 289 surveyed households were classified as farm households, because their head person was employed or carried business in the agrarian sector. Particular values of variables monitoring these characteristics in the EU-SILC are:

#### ***variable ZAM\_P (employment of a head person of the household)***

with the possible alternative values of the answer:

- Skilled workers in agriculture, forestry, fishery and game management
- Workers acquiring their livelihood in agriculture and fishery (self-suppliers)
- Unskilled workers in agriculture, forestry, fishery and in related fields

#### ***variable ODV\_P (branch of activity of a head person)***

with the only possible value:

- Agriculture, hunting and related activities

Share of farm households in the total number amounted to 2.99 %, which corresponds generally

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<sup>6</sup> For instance, in 2007 the total so-called tax quota, accordingly the proportion of total tax yield and customs revenue to GDP, amounted to 36.3 % in our country. See report of the Ministry of Finance of the Czech Republic, published on 26 July 2007, available at <http://www.sfinance.cz/zpravy/finance/121559-cr-v-danovem-srovnani-s-okolnimi-zememi/>; cited 18th April 2010.

to data of the Czech Statistical Office (Český statistický úřad) on share of labour forces in agriculture in total number of active labour forces<sup>7</sup>.

Average value of income of the “farm“ household in 2007, recounted per physical member, amounted to CZK 9 740 per month. Average value for the entire surveyed population reached CZK 10 184 per month. This indicates that the average per person income of the Czech farm households is lower by 4.37 % than average monthly income in Czech society.

As a measure to estimate the share and number of economically threatened households in the society we have applied, in accordance with the OECD and Eurostat methodology, the median value of the relevant income variable. Median of disposable income, calculated per physical member of the household, is equal to CZK 8 967 per month. Median value of income of farm households is CZK 9 013 per month. In this regard, the situation is then balanced (respectively the income median is by 0.51 % above the value for the entire set of respondents). This sentence should be reformulated accordingly with the both yellow marked fragments.

Our analysis of median values is applied to identify the proportion of the at-risk-at-poverty households associated with the disposable income under the 60 % of this median value.

In the survey, 829 of all households were identified, incomes of which per one physical member didn't reach the threshold value. There were 35 farm households, which represents 8,6 % of the at-risk-of-income poverty living under the poverty line.

As for the farm households each eighth of them (12.1%) suffered has been jeopardized by the income poverty.

From the partial viewpoint this finding would confirm the initial thesis, originally expressed by representatives of the Agricultural Association of the Czech Republic (Zemědělský svaz ČR), on classification the Czech agriculture as “the sector at-risk-of-income poverty“.

Nonetheless, value of the poverty intensity indicator isn't as high at farm households as in the summary set of all households – the monthly additional income CZK 780 per member would be sufficient for farm households on average to get all of them above the income poverty threshold. However, to achieve a general elimination of income poverty at respondents of the survey, each

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<sup>7</sup> See Farm Structure Survey 2007 results, available at <http://www.czso.cz/csu/2008edicniplan.nsf/engpubl/2126-08-2007>; cited 15th April 2010

member of risk-at-poverty households would have receive on average additional CZK 960 per month. Authors are inclined to explain this by fact that although the agriculture is economically weak sector, it provides anyway a possibility of financial security significantly above the frame of the social system of the government.

### **Income diversification**

Analysis of income quintiles resulted in following findings:

Set of the surveyed households was ordered according to their disposable incomes, recounted per physical member and consequently it was split into quintiles. Particular measures of income inequality were subsequently expressed by means of the Gini coefficients.

Having in mind the above data we see that 68 of the total number of 289 farm households were included in the first, the lowest income quintile and 51 in the fifth quintile, the highest one. Although it may be pointed out that the lowest income group contained more farmer households by 33.3 % than the highest one, this statement cannot be regarded as a statistically valid due to the low number of subjects. Verification of this statement would require a further research.

Mean value of the disposable income of all households in the first quintile reached CZK 5 604 and CZK 15 547 per month in the fifth quintile. Disposable incomes of the lowest group amounted then to 29.7 % of incomes of the highest group. By selection only farm households in both boundary quintiles the value of proportion 39.4 % was acquired, boundary incomes were then much “closer“ – limits of the income differentiation were narrower than for the entire set (however, when expressing conclusions it is necessary to take into account a relatively low number of subjects in the analyzed sample again).

The Gini coefficient, calculated on base of the obtained data, reached values 0.25 for both datasets. It means the income distribution among farm households had the same uniformity as the set of all households. The Gini coefficient of the surveyed segment showed relatively even

diversification of incomes among all quintiles, which indicates a higher stability (of what?) in the long-term horizon. However, only one of indicators was concerned of course and authors are aware that such conclusion cannot be expressed without taking into account more facts and relevant data.

## **Conclusion**

Authors don't offer any exactly defined hypotheses or conclusions on income situation of farm households. The presented outcomes should be understood as an input for subsequent research. Purpose of this paper is to measure the basic parameters of the living conditions of Czech farm households as well as to show the available methodological tools linked to the EU-SILC project.

Procedures used in further work will include among others the international comparisons of the same income variables and their parameters. For this purpose indicators are constructed via equivalized size of households<sup>8</sup> according the OECD and Eurostat methodology.

Furthermore, the quintiles and deciles income analysis are worked out and other standpoints of the main data set structure and calculations of indicators of income inequality measure for further segments are used.

Conclusions will be connected with parallel research of consumption expenditures of households, partial results of which were presented by Stávková et al. (2008). They will be subsequently used not only for other derived research<sup>9</sup> and discussions within the academic community but also to support the decision-making of political institutions and the social policy formation and guidance. Last but not least for objective presentations to general public.

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<sup>8</sup> Values are based on the so-called equivalized disposable income, defined as the total disposable income of the household divided by its equivalent size. The equivalent size is determined on the basis of the modified OECD scale (giving the weight 1.0 to the first adult, 0.5 to other persons in age of 14 years or more, living in the household and 0.3 to each child younger than 14 years).

<sup>9</sup> For instance the research of influence of dynamism of income differentiations on international marketing applications, as Nagyová et al. deal with them (2007) and the „consequences on financial situation and the production structure and other regional differences“, as the Cianian et. al (2001) speaks about them, are considered to be analyzed.

*Development of business sphere relationships in connection with changes in life style, purchase behaviour of population and changes in corporate environment in the integration and globalization processes.*

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