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2011

Online at https://mpra.ub.uni-muenchen.de/36464/
MPRA Paper No. 36464, posted 06 Feb 2012 12:32 UTC

INCOME DIFFERENTIATION OF HOUSEHOLDS IN VARIOUS REGIONS OF THE CZECH REPUBLIC

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Abstract

The paper deals with income differentiation of households in different regions of the Czech Republic. Actual analysis are based on previous considerations about the origins and dynamics of income disparities in the Czech republic, about the method used to definethe group of respondents, the characteristics of a file with an emphasis on the income variable, the share of social transfers in disposable income, indicators of inequality and poverty assessment of vulnerable households. The primary data sourceare the survey results European Union – Statistics onIncome and Living Conditions in 2005 and 2008. This investigation has become obligatory for the Czech Republic after joining the European Union since 2005. The investigation provides long-term comparative data on income and social situation of households. According to common methodology applied within other EU countries results are compare even between EU member states. To achieve the objectives there will be used following methods: descriptive statistics on the characteristics of income (disposable income of households, the share of social transfers in household disposable income, net cash income of households, average income, revenue deficits). For monitoring the level of income inequality and deepness of poverty will be used Gini coefficient and Lorenz curve. Mentioned characteristics will be compared within the regions of the Czech Republic and the trend will be formulated for the period 2005 - 2008.Household income is one of the decisive factors determining the style of family life, their priorities, to meet their needs, and eisure-time activities. Differences between regions determine preferences and identify opportunities.

Key words: poverty, poverty line, at-risk-of poverty, income situation of households, income situation of population

Introduction and Literature review

Czech economy has experienced a period of significant economic growth and a period of economic crisis in recent years. Review of this development and searching for causes is and mainly in the future it will be the content of a number of theoretical and practical studies [Roženská, 2009]. Economic growth and development of society is closely related to the income situation of the population. A number of economic theories for a long time have been trying to explain the relationship between economic growth, the volume of gross domestic product per capita is the most often used indicator, and real living standards in different countries and regions.

This paper focuses on the analysis and presentation of income situation of population. As the basic source there are used data by Eurostat and the EU-SILC. EU-SILC survey has been taking place in the Czech Republic since 2005, it is performed under a single methodological procedure, for all the countries of the European Union. The key variable, obtained by this survey, is the disposable income per one household member. On the basis of this information (disposable income per household member) it is possible, with use of identical methodical procedures, to monitor the income situation of household by selected members according to their membership of a social group, age, place of residence. The collapse of the income situation intensively affects the household, whose leading members are employees or self-employed persons under the affiliation of the national economy.

Stejskal and Stávková deal with agricultural sector in their contribution of income situation of Czech farmers [Stejskal, Stávková, 2010]. Effects on rural areas as a whole region and its development examined Střeleček [Střeleček, 2000.] Furthermore, to observe differences in income situation of households in individual regions, and finally it is possible to monitor the share of social transfers in total income of household. The results obtained and derived inference may have high value in the implementation of social policies of national governments, as well as support for individual regions. [Vecerek, 2001]

The aim of this paper is to analyze core indicators generated by the SILC project reflecting income situation of household and mainly of the households whose living standard is below poverty threshold. The second objective is focused on finding differences of indicators of living standard in individual regions. The third objective of this paper is to identify and to assess the share of social transfers of households in their income situation.

Methodology

EU-SILC project (European Union - Statistics on Income and Living Conditions) is a statistical research on income and living conditions of households, which is performed in the Czech Republic every year since 2005. The survey is conducted by the Czech Statistical Office, its implementation has become mandatory for the

Czech Republic after its accession to the European Union.

The survey takes place in all regions of the Czech Republic. The survey unit is flat and people who are resident of the apartment. The selective plan is a two-level random selection and the number of flats was selected proportional to the size of the region. The counting districts, from which flats are chosen in the second level, are chosen randomly. The basic variable is height of income of particular household, completed by additional variables to control the accuracy and to analyze the socio-economic environment of the surveyed units. The selective sample includes 4351 housing units in 2005 and 11,924 housing units in 2008. Key characteristics are following:

A – Identification of households

A1 – type of households

A2 – data on household members

A3 – social characteristics

B – disposable income

C – number of physical members of household

D – adjusted number of household members

E – average income per household member

Disposable household income is used in accordance with Eurostat methodology, for the purposes of international comparison and for calculating the poverty indicators. Disposable income equivalent is an indicator which respects the separation of the total disposable income, according to a uniform size of the household, ie. For the first adult member we count coefficient of 1, for the second and other members of the household with a coefficient of 0.5, for children under 14 years of age with a coefficient of 0.3.

Disposable income physical is an indicator respects, compared with an equivalent disposable income, the actual number of household members, following this it deduce total distribution of disposable income, for each household member we count the coefficient 1.

The analysis of income deciles is a way of determining the income situation of households and it is based on comparing the income characteristics of the upper and bottom deciles. The most often surveyed in practice is the ratio between highest and lowest deciles before and after social transfers.

The poverty threshold is based on knowledge of the theoretical distribution of income variable, specifically the log-normal distribution, which allows us to estimate the proportion of low-income vulnerable population as a median value of 0.6. In general the share of income vulnerable households (PPOD) might be expressed as:

$$PDOD = \int_0^{0,6Med} \frac{1}{\sigma\sqrt{2\pi}} \exp\left\{\frac{\ln x - \mu}{\sigma}\right\}^{\wedge} 2xdx$$

,where the essential indicator used to determine income inequality of monitored file is Gini coefficient. Mathematically for the expression of its value there is used relationship, where xi is the cumulative value of the population variable and di is income variable:

$$\text{Gini} = 0,5 - \int_0^1 F(x,d)dx$$

The structure of social transfers in the Czech Republic is made by four following items:

State social support

Retirement insurance

Benefits in material need

Sickness insurance benefit system

Health insurance

Relief of unemployment

Other social income

State social support is made by benefits paid with respect to income of household, for example child allowance, social allowance and housing allowance and then by benefits paid regardless of household income, parental allowance, foster care benefits, birth and death grants. Retirement insurance is divided into old-age pension, disability pension, widow's pension and orphan's annuity.

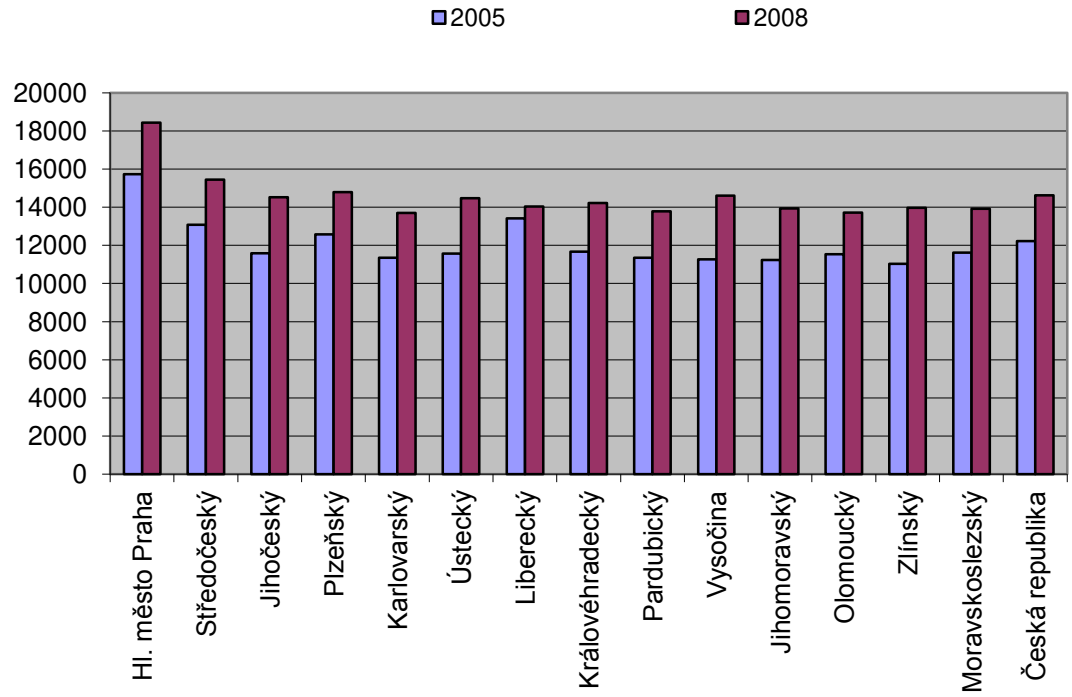
Results and discussion

Basic information about the income situation of households in the Czech Republic between 2005 and 2008 by region is shown in Table. 1.

Table 1: Income situation of households in the Czech Republic in CZK per household member

Region	2005								
	mean fyz.	mean ekv.	Relative expression %	Median	Relative expression %	poverty line	Number of at-risk-of-poverty households	Relative expression	Gini coefficient
Hl. město Praha	12314	15730	129	13756	131	8254	16	3,41	0,28
Středočeský	9776	13086	107	10504	100	6302	26	5,66	0,27
Jihočeský	8671	11582	95	10632	101	6379	10	4,02	0,19
Plzeňský	9568	12573	103	10877	104	6526	12	4,36	0,24
Karlovarský	8595	11358	93	10144	97	6086	9	7,63	0,20
Ústecký	8663	11564	95	10295	98	6177	40	11,05	0,24
Liberecký	10181	13416	110	10730	102	6438	11	6,32	0,31
Královéhradecký	8641	11675	95	10291	98	6175	16	6,99	0,23
Pardubický	8170	11356	93	10566	101	6340	14	6,76	0,19
Vysočina	7901	11260	92	10403	99	6242	10	4,29	0,20
Jihomoravský	8472	11236	92	10111	96	6067	28	6,59	0,22
Olomoucký	8380	11531	94	9978	95	5987	25	8,12	0,23
Zlínský	8055	11034	90	9914	94	5948	21	9,71	0,22
Moravskoslezský	8658	11627	95	10061	96	6037	58	9,63	0,25
Česká republika	**9152**	**12232**	**100**	**10500**	**100**	**6300**	**296**	**6,80**	**0,26**
Region	2008								
	mean fyz.	mean ekv.	Relative expression %	median	Relative expression %	poverty line	Number of at-risk-of-poverty households	Relative expression %	Gini coefficient
Hl. město Praha	14 177	18442	126	15417	120	9250	25	2,63	0,28
Středočeský	11 554	15445	106	12866	101	7720	64	5,46	0,26
Jihočeský	10 660	14515	99	13271	104	7963	28	3,73	0,21
Plzeňský	11 070	14785	101	13394	105	8036	28	4,42	0,20
Karlovarský	10 254	13699	94	12308	96	7385	29	7,69	0,21
Ústecký	10 993	14476	99	12522	98	7513	82	8,80	0,25
Liberecký	10 353	14031	96	12783	100	7670	22	4,73	0,21
Královéhradecký	10 363	14228	97	12646	99	7588	24	4,12	0,21
Pardubický	10 089	13779	94	12416	97	7450	24	4,07	0,20
Vysočina	10 512	14614	100	13062	102	7837	24	3,85	0,21
Jihomoravský	10 298	13931	95	12458	97	7475	75	6,52	0,22
Olomoucký	10 264	13715	94	12324	96	7394	62	8,26	0,22
Zlínský	10 148	13970	96	12481	98	7489	41	5,81	0,21
Moravskoslezský	10 498	13918	95	12611	99	7567	100	6,20	0,21
Česká republika	**10901**	**14627**	**100**	**12798**	**100**	**7679**	**628**	**5,56**	**0,23**

Source: SILC



Graph 1: Average income of household in particular regions

Graphical expressions of average income of household in 2005-2008 in particular regions of the Czech Republic are shown in Graph 1.

All comments and other derived characteristics are related to equivalised disposable income of household, which allows international comparison. The average income D - FYZ is stated to compare at first both of the characteristics. The values of D-FYZ, according to the method are always lower, because the total income is divided by a higher value - the number of household members, regardless of household structure. Resulting from the data shown in Table 1 the average income per person in 2005 was CZK 12 232, in 2008 CZK 14 627, there is an increase of 19.5%. Above the average value of income in the Czech Republic there were 4 regions in 2005: Capital city Praha, Stredocesky, Liberecky a Plzensky region, in 2008, there were also 4 regions with only one change - Liberecky region were replaced by Vysocina.

The median for the period increased by 21.9%, which means more favorable condition during the reporting period in the sense that the average value was achieved by a higher number of households. Then resulting from the table is that the lowest average income per household member was reached in regions Olomoucky and Zlinsky region in 2005, in 2008 Karlovarsky, Olomoucky and Pardubicky region. The median value confirms the lowest incomes in Olomoucky and Zlinsky region in 2005, in 2008 in Olomoucky region, and Karlovarsky region. With low average incomes and medians the poverty thresholds conform – Zlinsky region CZK 5 948 and Olomoucky region CZK 5 987 in 2005 and CZK 7 393 Olomoucky region and CZK 7385 Karlovarsky in 2008. (Table 1)

Calculations of the poverty indicators show that 6.8% of households live on the poverty threshold, which was in 2005 amounted to CZK 6 300 per month and in 2008 it was amounted to CZK 7 679 per month, listed in Table 2.

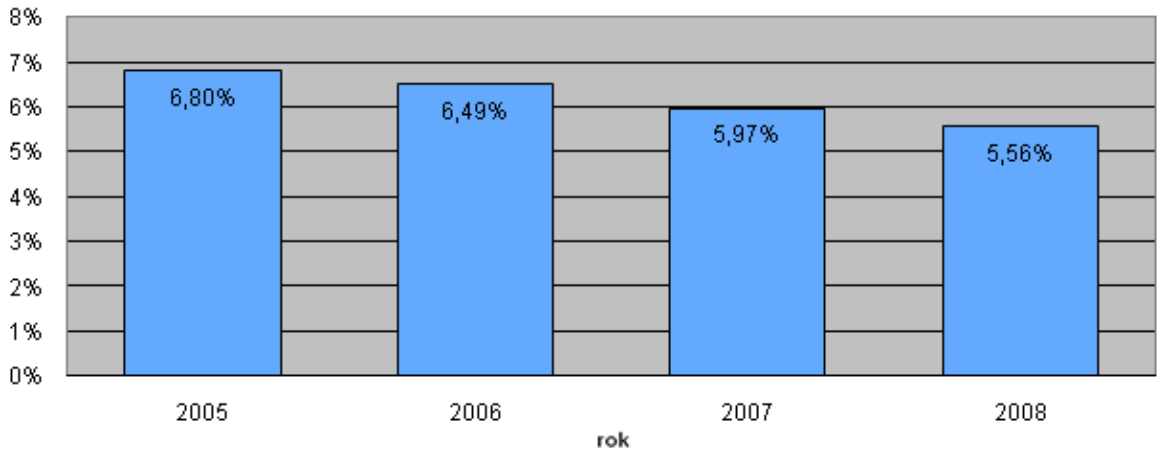
Table 2: At-risk-of-poverty threshold

CZ	Poverty threshold (monthly) CZK	Poverty threshold (annually) CZK	Vulnerable households Relative expression	Vulnerable households Absolute expression	Gini coefficient
2005	6 300	75 600	6,80 %	4351	0,26
2008	7 679	92 148	5,56 %	11299	0,23

Source: SILC

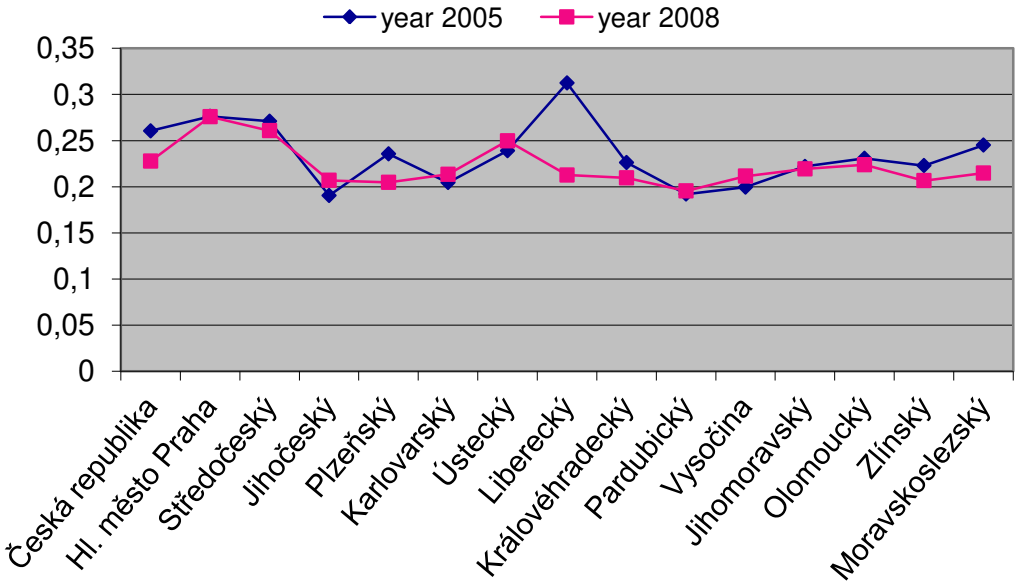
There is apparent decline in the number of households at risk of poverty which is evident from all of the indicators above. In 2005, the most vulnerable households are in region Ustecky region, Zlinsky region and Moravskoslezsky region. The lowest number of at risk of poverty households is in region Capital city Praha, in Jihocesky region and Vysocina. In 2008, the number of households at risk of poverty decreased by 1.24%. The most of at risk of poverty households remains the region Ustecky region, followed by Olomoucky region and Karlovarsky region, which in 2005 were not at the risk of poverty.

On the contrary in region Zlinsky and Moravskoslezsky region the rate of poverty significantly declined since 2005. This statement have to be taken into account with the increase of poverty threshold from CZK 6 300 to CZK 7679, which is 1.21 %. The lowest share of at risk of poverty households in both surveyed periods were in region Capital city Praha (only 3.41% and 2.63%), in 2005 also in Jihocesky (4.02%), in 2008 in Vysocina (3.73%). Development of number of at risk of poverty households for 4 surveyed years is shown in Graph 2. It is interesting to compare these calculated values with the opinion survey of citizens, their perception of poverty threshold. According to results of survey of STEM company the poverty threshold for 4 member household is on the level of total income of CZK 18 500 (which is CZK 4 500 per household member).



Graph 2: At-risk-of-poverty households

Gini coefficient is indicator of rate of income inequality. Its decline in both surveyed periods signifies decreasing rate of income differentiation. Values are shown in Table 1 and diagrammatized in Graph 2 for 2005 and 2008 in particular regions. There are evident significant differences between regions and their diverse development in 2005 and 2008.



Graph 3: Ginni coefficient in particular regions of the Czech Republic

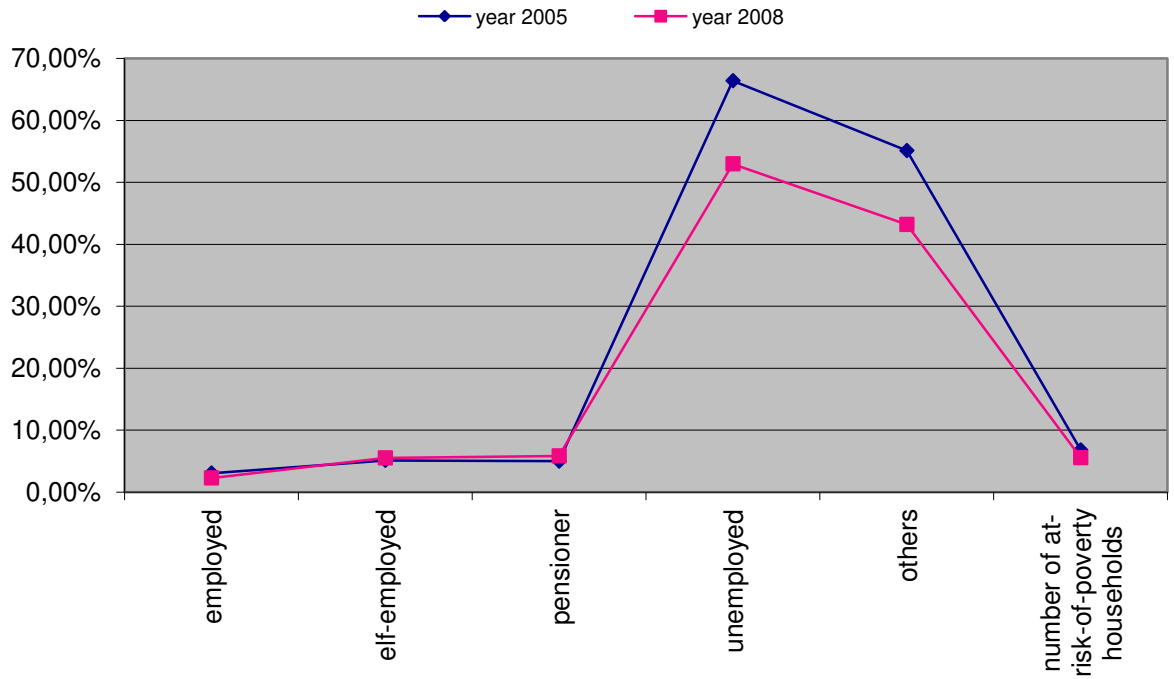
Project EU SILC allows analysis of at risk of poverty households according to different household structure type. This contribution at first took into account segmentation of households by social aspect. The results are shown in Table 3.

Table 3: Table with numbers of at-risk-of-poverty households according to social groups

Type of household	2005			2008		
	Number of at-risk-of-poverty households (abs.)	**Total number of surveyed households**	**Relative number (%)**	**Number of at-risk-of-poverty households (%)**	**Total number of surveyed households**	**Relative number (%)**
Employed	66	2148	3.07	124	5438	2.28
Self-employed	20	391	5.12	51	924	5.52
Pensioner	80	1603	4.99	266	4556	5.84
Unemployed	87	131	66.41	133	251	52.99
Others	43	78	55.13	54	125	43.20
Sum	**296**	4351	6.80	628	11294	5.56

Source: SILC

The values listed in the table confirmed the assumption that the most vulnerable households are from the unemployed category, the least vulnerable households are in category employed. Roughly same percentage of representation there is for group of self-employed and pensioners groups. For both groups during the reporting period, the number of households at risk of poverty increases. The most interesting finding is that the number of at-risk-poverty households in unemployed category decreases, significantly, around 12. From the findings it is possible to deduce that the social benefits of groups self-employed persons and pensioners (even if insignificantly) are sufficient reason for studying the redistribution of income through taxation and social transfers. Graphic presentation of the number of households at risk of poverty by social groups signifies Graph 4.



Graph 4: Number of at-risk-of-poverty households by social group

Number of vulnerable household according to number of household members and their risk of poverty is shown in Table 4.

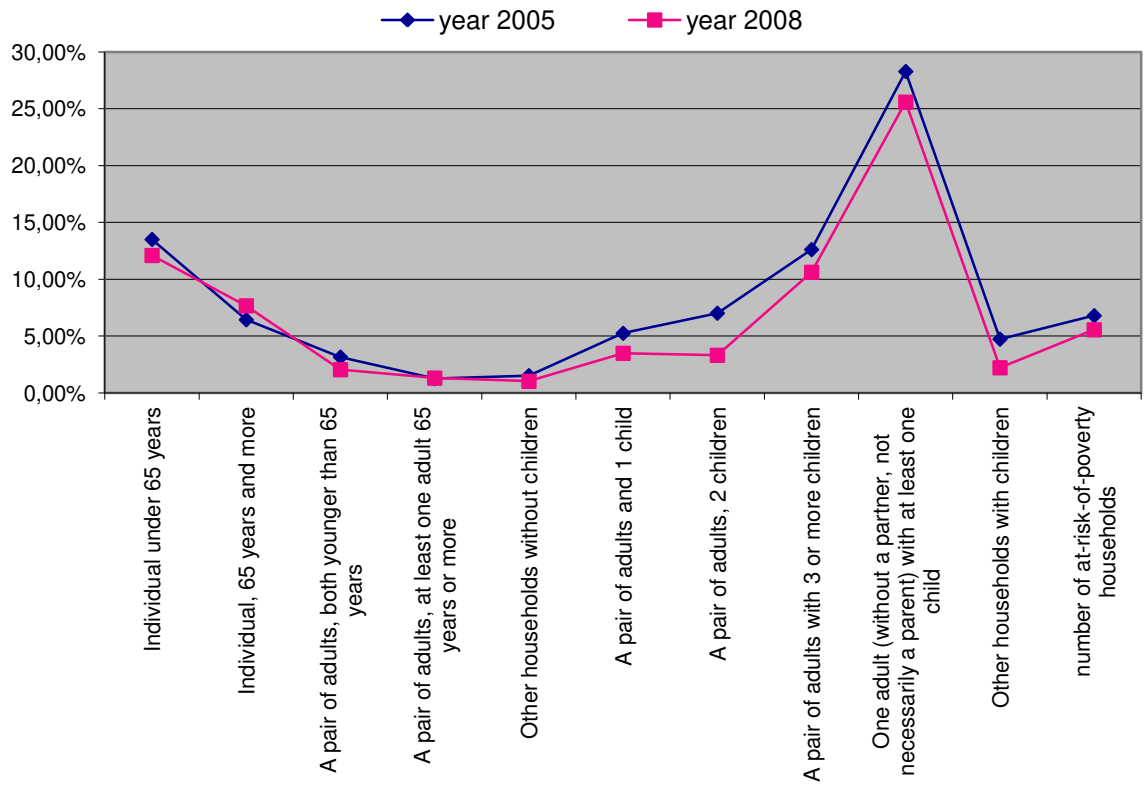
Table 4: Number of vulnerable households according to number of household members

	2005			2008		
Type of household	**Number of at-risk-of-poverty household (abs.)**	**Total number of households (surveyed)**	**Relative number (%)**	**Number of at-risk-of-poverty household (abs.)**	**Total number of households (surveyed)**	**Relative number (%)**
Individual under 65 years	82	607	13.51	176	1455	12.10
Individual, 65 years and more	40	621	6.44	132	1722	7.67
A pair of adults, both younger than 65 years	25	791	3.16	38	1851	2.05
A pair of adults, at least one adult 65 years or more	7	554	1.26	22	1681	1.31
Other households without children	6	391	1.53	10	973	1.03
A pair of adults and 1 child	19	362	5.25	33	946	3.49
A pair of adults, 2 children	37	527	7.02	44	1325	3.32
A pair of adults with 3 or more children	13	103	12.62	31	292	10.62
One adult (without a partner, not necessarily a parent) with at least one child	58	205	28.29	130	508	25.59
Other households with children	9	190	4.74	12	541	2.22
Sum	**296**	**4351**	**6.80**	**628**	**11294**	**5.56**

Source: SILC

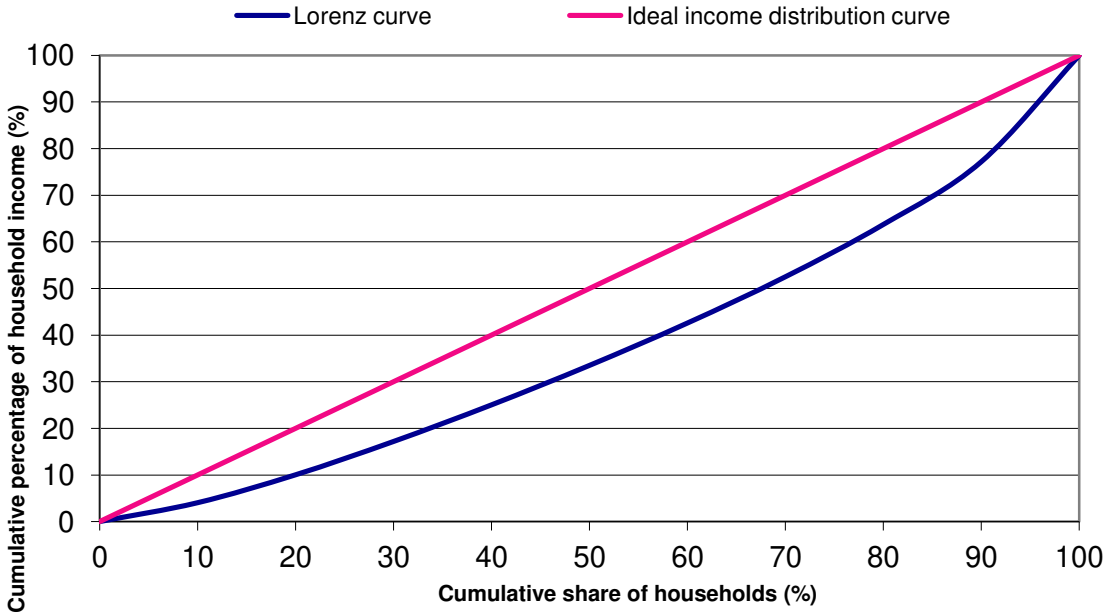
The table above shows that households in category one adult with at least one child, as well as category individual under 65 years and category two adults with three or more children are most often below the poverty threshold. Types of households at risk of poverty in the period 2005 and 2008 did not significantly change. For most categories of households the number of households at risk of poverty in 2008 compared to 2005 decreased, there is the largest decrease for complete families - a pair of adults with 2 children - more than 3.5%. The situation is clearly shown in Graph 5.

These results indicate the fact, that indicators influencing the income inequality are becoming more social and economic characters, it is possibly affected by the pressure of certain interest groups. Category pensioner is in field of redistribution in another position, because in accordance with some authors retirement pensions don't act as redistribution.



Graph 5: Households at risk of poverty according to the number of household members

The depth of poverty, which reflects how households living below the poverty threshold are far to overcome this border, is expressed by Lorenz curve in Graph 6.



Graph 6: Lorenz curve

An overview of social transfers, provided by social types of benefits in particular regions of the Czech Republic in 2005 and 2008 is provided in Table 5.

Table 5: Overview of provided social transfers in particular regions

2005							
Region	**State social support**	**Retirement insurance**	**Benefits in material need**	**Sickness insurance benefit system**	**Health insurance**	**Relief on unemployment**	**Other social income**
Hl. město Praha	7,53%	87,87%	0,00%	4,60%	-	0,00%	0,00%
Středočeský region	7,30%	88,00%	0,75%	2,57%	-	1,10%	0,23%
Jihočeský region	7,93%	84,71%	0,95%	3,90%	-	1,32%	1,13%
Plzeňský region	7,63%	87,52%	0,02%	3,07%	-	0,89%	0,81%
Karlovarský region	10,92%	78,10%	1,83%	6,13%	-	1,45%	1,42%
Ústecký region	11,65%	78,27%	2,61%	3,01%	-	3,08%	1,32%
Liberecký region	11,05%	78,54%	0,98%	5,07%	-	2,82%	1,38%
Královéhradecký region	9,72%	83,53%	1,37%	2,65%	-	1,76%	0,89%
Pardubický region	12,54%	75,33%	1,27%	6,04%	-	1,74%	3,01%
Vysočina	10,43%	77,57%	0,66%	6,37%	-	2,03%	2,84%
Jihomoravský region	9,63%	81,74%	0,74%	4,01%	-	1,90%	1,91%
Olomoucký region	12,99%	77,85%	2,53%	3,93%	-	1,63%	0,96%
Zlínský region	12,10%	72,48%	2,67%	8,61%	-	1,63%	2,46%
Moravskoslezský region	10,90%	78,51%	3,28%	3,33%	-	1,76%	2,19%
Česká republika	9,87%	81,45%	1,53%	4,02%	-	1,64%	1,43%
2008							
Region	**State social support**	**Retirement insurance**	**Benefits in material need**	**Sickness insurance benefit system**	**Health insurance**	**Relief on unemployment**	**Other social income**
Capital city Praha	7,26%	89,01%	0,11%	1,93%	-	0,59%	1,11%
Stredocesky region	8,96%	84,58%	0,10%	2,96%	-	0,75%	2,65%
Jihocesky region	12,72%	79,38%	0,07%	4,18%	-	0,88%	2,76%
Plzensky region	9,57%	83,82%	0,10%	3,52%	-	0,99%	2,00%
Karlovarsky region	14,23%	78,27%	0,70%	3,88%	-	0,49%	2,43%
Ustecky region	12,30%	80,39%	0,91%	2,60%	-	1,04%	2,75%
Liberecky region	9,07%	84,56%	0,46%	2,97%	-	1,02%	1,93%
Kralovehradecky region	11,61%	80,72%	0,51%	3,53%	-	1,10%	2,54%
Pardubicky region	12,52%	79,65%	0,11%	3,48%	-	1,21%	3,03%
Vysocina	11,61%	77,28%	0,18%	6,10%	-	1,45%	3,38%
Jihomoravsky region	9,49%	84,65%	0,11%	2,79%	-	1,10%	1,86%
Olomoucky region	10,35%	79,71%	0,30%	4,15%	-	1,13%	4,37%
Zlínsky region	10,72%	78,40%	0,42%	5,72%	-	0,98%	3,75%
Moravskoslezsky region	10,17%	82,31%	1,13%	3,13%	-	0,57%	2,69%
Ceska republika	10,46%	82,09%	0,41%	3,48%	-	0,92%	2,63%

Resulting from overview above between Czech regions there are sufficient disparity in provided allowances, as well as different trends in monitored years. The benefits representing the largest volume, pensions paid increased by 20% in Prague. There is decrease of the paid pensions in region Jihocesky, Plzensky. Other regions recorded growth in pension which is equivalent to the volume growth in the Czech Republic as a whole. Generally in almost all the regions the volume of paid sickness benefits decreased. To monitor the trend of the social income provided between 2005 and 2008, respectively their share of disposable household income is shown in Table 6

Table 6: Share of social income

Share of social income	**2005 (%)**	**2008 (%)**
1. State social support	9,86	10,46
2. Retirement insurance	81,45	81,1
3. Benefits in material need	1,43	0,41
4. Sickness insurance benefit system	4,02	3,48
5. Health insurance	0,77	-
6. Relief of unemployment	1,64	0,92
7. Other social income	1,43	2,63

Source: SILC

In 2005 the share of social transfers in net disposable income in was 31.51%. Social transfers were accepted by 79.98% of households. In 2008, the share of social transfers in net disposable income was 32.57%. Social transfers were accepted by 81.04% of households. It is evident that there is an increase in share of households receiving social benefits. This is mainly due to the increased number of people receiving old-age pension. Parental contribution grew, and conversely child allowances and sickness benefits declined. To formulate an opinion on the issue of the relationship between economic growth and living conditions of households it is necessary to state basic macroeconomic indicators in addition to analyzed characteristics of income variables. Table 7.

Table 7: Basic macroeconomic indicators

Indicator/year	**2005**	**2006**	**2007**	**2008**	**2009**
GDP v % (annual changes)	6,3	6,8	6,1	2,5	-4,1
Unemployment rate (%)	8,88	7,67	5,98	5,96	9,2

Source: CSU

The positive development of macroeconomic indicators has been interrupted due to financial and economic crisis in the world in 2008 respectively 2009. Social indicators and other indicators derived from the income situation of households respond to changes in macroeconomic indicators with a certain time lag. That is the reason for monitoring data of SILC research in 2009 and following years, not only to investigate the intensity of the impact on households, but also focus on timing of the impact.

Conclusion

In the centre of interest of many analytical studies about income situation of households are risk-of-poverty households, respectively households that are living in poverty. In the years 2005 to 2008 Czech Republic has positive trend in the number of at-risk-of-poverty households. The number of these households dropped from 6.8% in 2005 to 5.56% in 2008. In these years Czech Republic achieved the lowest percentage of households affected by poverty across the EU. From the project SILC in years 2005 - 2008 following information results, during positive economic development in the Czech Republic, the number of at-risk-of-poverty households declined (Ginni rate decrease reflects the decreasing level of income differentiation), the most vulnerable categories of households are categories one adult without a partner and with at least one child, than category individual under 65 and category of households with three or more children. During the monitored period there was a decline in the number of households at risk of poverty in the unemployed category. The share of social transfers in disposable income grows (about 1% for the period of 3 years). Income differentiation in individual regions didn't indicate significant fluctuations except region Capital city Praha.

The indicator of number at-risk-of poverty households corresponds to the economic development in society. Eg. Average household income does not indicate change in trend of GDP or these changes can be reflected in low level and with some delay. Therefore, it can be expected change of trend of indicator about number of at-risk-of poverty households. This indicator reflects the poverty risk of relative poverty. Machova said [Machova, 2009] as well as it is stated by some authors [Bařina, Valentova, Vrzal 2007] , the relative poverty means that people's needs are satisfied at a lower level than the average individual in society. There is still high interest of developed societies through social policies and instruments to address this situation, nevertheless this is the relative poverty. Number of households at risk of poverty ultimately leads to social exclusion and increasing negative social phenomena.

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