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IMPACT OF TAXES ON REDISTRIBUTION IN THE CZECH REPUBLIC

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Abstract

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The paper deals with the distributive effects of taxes during last years in the Czech Republic. Using EU-SILC data for selected types of households, the paper assesses changes in the distribution of gross incomes and effects of the changes in taxes on the distribution of incomes after taxes. The analysis is carried out on different types of households. The analysis is performed using Lorenz curves and Gini coefficients. The conclusions show that the tax system has changed the distribution of incomes insignificantly.

Czech Republic, redistribution, tax reforms

In all developed countries, government changed taxes and benefits every year. These changes have impacts on the redistribution of income or wealth (Kubátová, 2010; Široký, 2008). This problem o distributive impacts is not yet solved in the framework of harmonization of tax systems, although it is clear that the gradual harmonization in this area (Nerudová, 2011) will have an impact on redistribution.

For evidence-based discussion of a tax policy, is necessary to measure the impact of tax changes on the distribution of household income. These measurements can be done on the macro level, i.e. from the perspective of all households respectively individuals (question of a tax units) or at the micro level, i.e. for different household types. In this case it is possible to use a dual approach. First, a simplified modelling of the impacts of taxes on standardized household. In this case are modelled impacts of taxes on hypothetical tax unit. Second, it is an approach that uses actual data from the statistics of income and expenditure of households, such as statistics or family accounts or EU-SILC (EC, 2010).

The main objective of this paper is to analyse (with the data for 2005–2009) the impact of tax changes on distribution of incomes in the Czech Republic and see if one can find a link between the type of government and the impact of tax changes on an income distribution.

METHODS AND RESOURCES

The Czech research in this field was published mainly at the beginning of the last decade. Večerník (2002 and 2006) analysed redistribution of incomes through taxes and benefits in the Czech Republic from 1988 to 1996 and 2006, respectively. Sojka (2000) discusses also earnings distribution and its development during the 1990s. Schneider and Jelínek (2001 and 2005) analysed distributive impacts of the Czech security and tax system in the 2000s and quantified impacts of taxes and benefits on individual deciles of households. Sirovátka and Valentová (2002) examined attitudes of voters in the Czech Republic and abroad in terms of the legitimacy of a redistribution and pointed out that attitudes of the Czech public to the social justice and redistribution are not entirely unambiguous. Bílková (2012) analysed distribution if incomes and wages in the Czech Republic. Vítek (2012a) discuss changes in personal income taxation in developed countries and its connection with redistribution.

In developed countries, Bhattarai and Whalley (2009) deal with redistributive effects of transfer programmes in the United Kingdom, Moriguchi and Saez (2008) show the development of income concentration in Japan during 1886–2005, using for analytical purposes mainly tax statistics. Piketty and Saez (2007) discussed the progressivity of the U.S.

federal tax system and its evolution since 1960 and compared the USA with other countries.

Europe-wide standardised survey European Union – Statistics on Income and Living Conditions (EU-SILC) is since 2005 performed also in the Czech Republic (name: Living Conditions). Data from this survey allow comparing not only households in the Czech Republic, but thanks to the standardisation also across the EU. This option also applies to an inquiry of representative data on income distribution of individual types of households, their gross income, taxes and transfers provided to the households. Data in the corresponding EU-SILC statistics reflect the status of the previous year. The taxonomy of households covers in the EU-SILC different types of households. These are general, described as the three-digit code, where the first number indicates the number of economically active adults in the household, the second number represents the number of economically inactive adult family members and the third figure is the number of children. For example, household type 111 means, that first adult is economically active, second adult is economically inactive and household has one child. In case there are more than 2 children in the household, the third number takes the value of 9. In order to analyse the impact of taxes on the income distribution, we will cover the following types of households:

111 First adult economically active, second adult economically. inactive, 1 child
112 First adult economically active, second adult economically. inactive, 2 children
201 Two economically active adults, one child
202 Two economically active adults, 2 children.

The analysis shows households that are complete (e.g. with two adults) and who have one or two children.

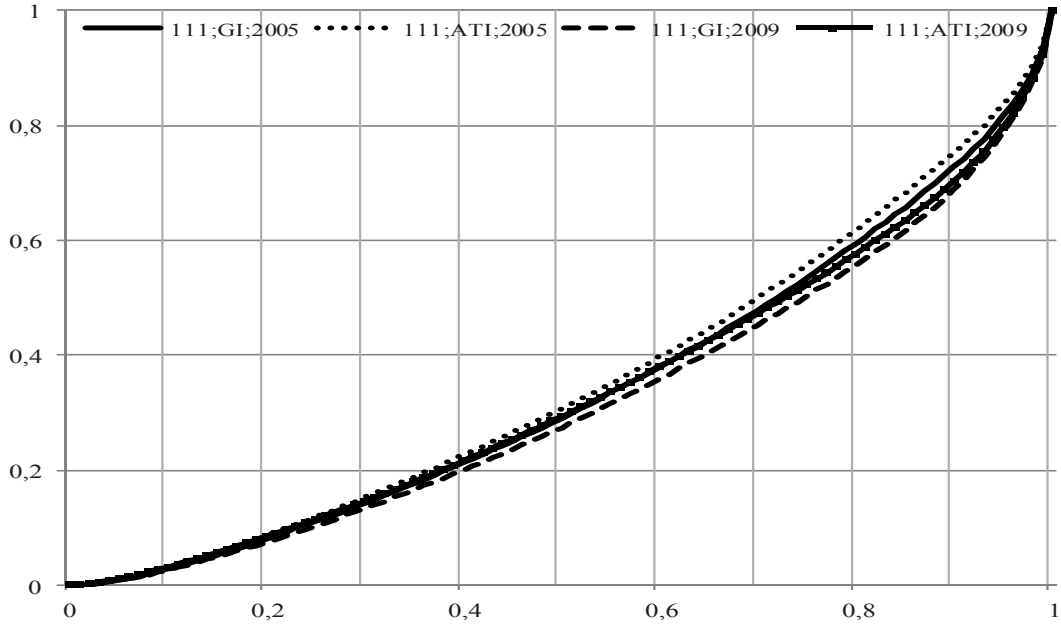
In order to analyse the impact of taxes on the income distribution, we will cover the following types of income: income P0, which represents earned income and income P1, which represents earned income minus insurance premia minus taxes plus tax credits. In this research we do not discuss impacts of benefits policy on income distribution.

Data are based on Europe-wide standardised EU-SILC data (EC, 2010) for the Czech Republic and using standard Lorenz curves and Gini coefficients (Hindls *et al.*, 2007) will be quantified impacts of these fiscal instruments.

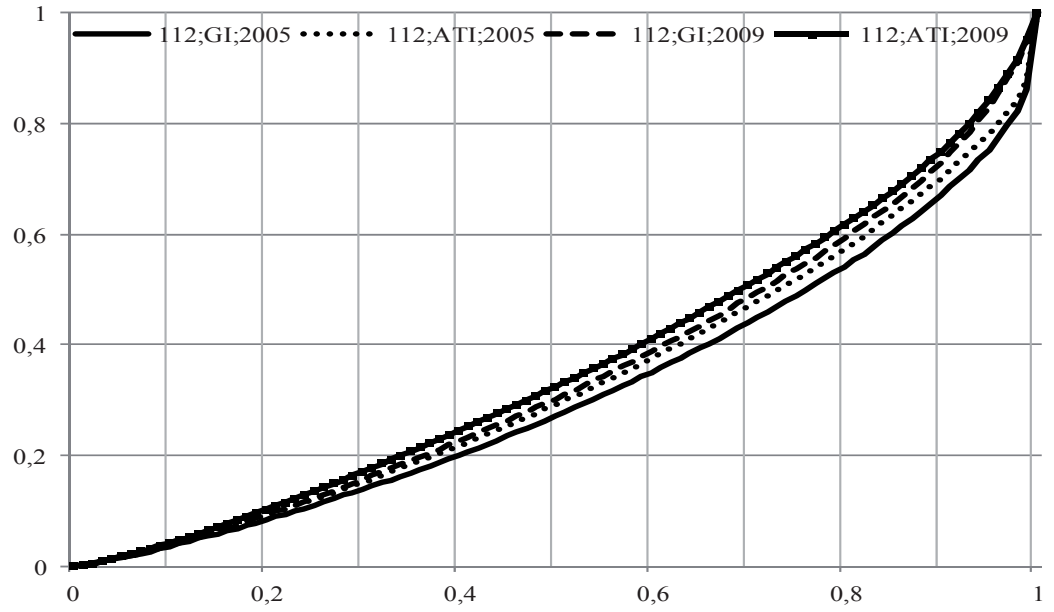
RESULTS AND DISCUSSION

Impact of taxes on Lorenz curves

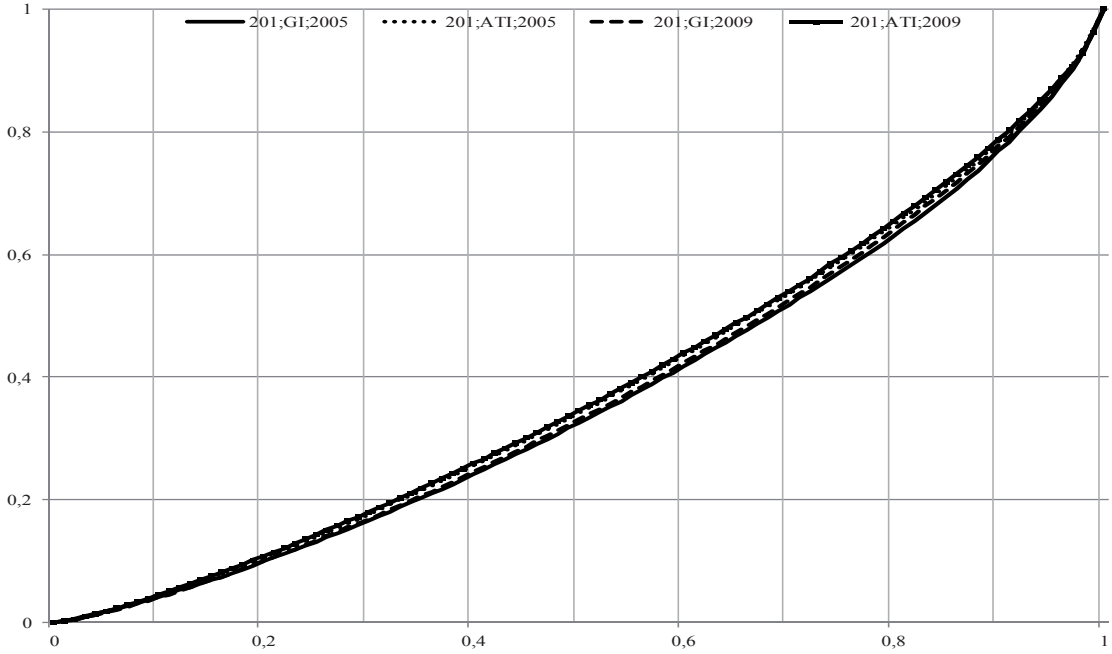
Frequently used tool for an analysis of the impacts of taxes and compulsory insurance premia on the distribution of income are Lorenz curves. The x-axis of Lorenz curves indicates households arranged from the poorest to the richest and the y-axis shows their cumulative share on the total income (wealth) of the file. Axes x and y are labelled in percentages or in hundredths up to one and Lorenz curves always start at zero and end at one. The line of equality (LC) shows that under completely equitable income distribution, each person / household would receive an equal share of income (wealth) and the value of the x-axis coordinate is in this case is always equal to the value of the y-axis coordinate (x is always equal to y). For the opposite extreme position to the flat distribution (Lorenz curve of total inequality) would



1: *Lorenz curves for households with first adult econ. active, second adult econ. inactive, 1 child (111): gross income (GI) and income after taxes (ATI)*
Source: own processing of EU-SILC data (2006–2010)



2: *Lorenz curves for households 112: GI and ATI*
Source: own processing of EU-SILC data (2006–2010)



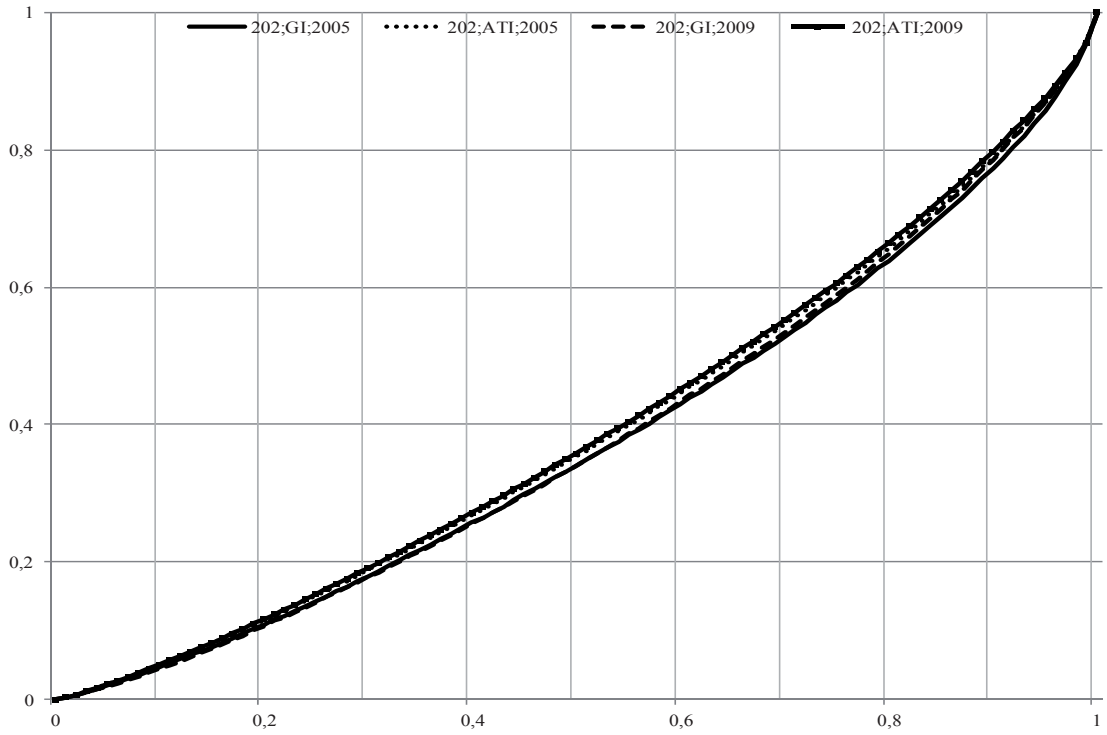
3: *Lorenz curves for households 201: GI and ATI*
Source: own processing of EU-SILC data (2006–2010)

apply that except for the last richest individual nobody acquires any income at all (for all x < 100% it holds that y = 0, for x = 100% is y = 100%). From Lorenz curves are derived Gini coefficients.

Following charts show impacts of changes in taxes and compulsory insurance premia on the gross income. Changes in Lorenz curves are shown for the years 2005 and 2009 and households 111, 112, 201 and 202.

From the results for years 2005–2009 it can be highlighted that:

- for household 111 income inequality has increased in *gross incomes* distributions; taxes and insurance premia have reduced inequality in all years the similarly,
- for household 112 income inequality has decreased in gross incomes distributions and taxes and insurance premia above that have reduced inequality in all years, but less for high income households in 2009,



4: *Lorenz curves for households 202: GI and ATI*
Source: own processing of EU-SILC data (2006–2010)

- for household 201 income distribution remains almost the same in gross incomes; taxes and insurance premia have reduced inequality in all years,
- for household 202 income distribution remains almost the same in gross incomes; taxes and insurance premia have reduced inequality in all years, but less for high income households.

Analysis shows that taxes and insurance premia had less significant role in redistribution for households 201 and 202 and main driver of net income changes has been changes in gross incomes. Tax reforms between years 2005–2009 also did not changed significantly impact of taxes on redistribution of incomes.

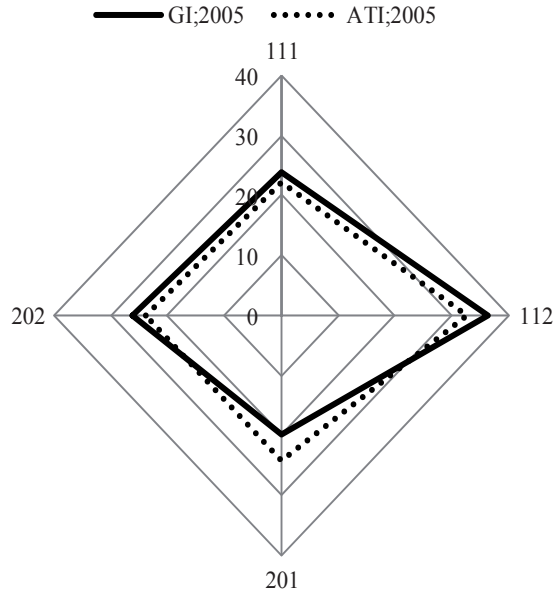
Results from previous research also on Lorenz curves show (Vítek and Pavel, 2012) that benefit systems have generally greater impacts on the total net income than systems of personal income taxation and insurance premia and their importance is greater in the first two to three quintiles. For high-income households (the last quintile or decile), they do not have a direct redistribution impact (but they have an indirect one).

b) Impact of taxes on Gini coefficients

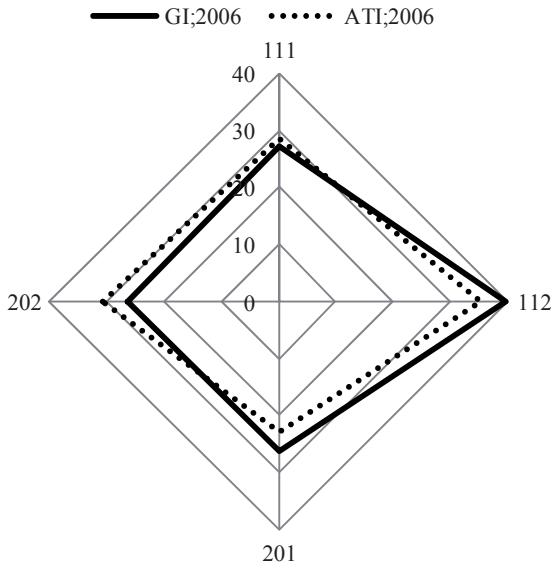
Other approach how to measure the impact of taxes on distribution of incomes is the Gini coefficient (GC) for the selected households. In this part, we will analyse the impact of taxes in the year 2006, when came into effect the so-called Sobotka tax reform, and the year 2008, when the tax system was reformed once again (reforms of the government of M. Topolánek). As in the previous section, we will take into account only the gross income before taxes and benefits (P0) and an effect of the income tax (including tax bonuses) and premia paid by an employee or a self-employed person (P1). Gini coefficient is the ratio between the actual surface of the Lorenz curve and the straight line of distribution, and the area under the actual Lorenz curve.

Decreasing Gini coefficient means that taxes reduced the inequality in distribution of the gross income and brought the Lorenz curve closer to the straight line distribution. In theory, taxes and insurance premia should rather reduce the Gini coefficient since they possess a built-in elements that support the redistribution. However, cancellation of progressive rates of personal income taxes since 2008 and the introduction of ceilings on insurance premia in the same year should reduce the progressivity. Benefit systems should also reduce the value of Gini coefficients, especially if benefits are provided mainly or exclusively to low-income groups.

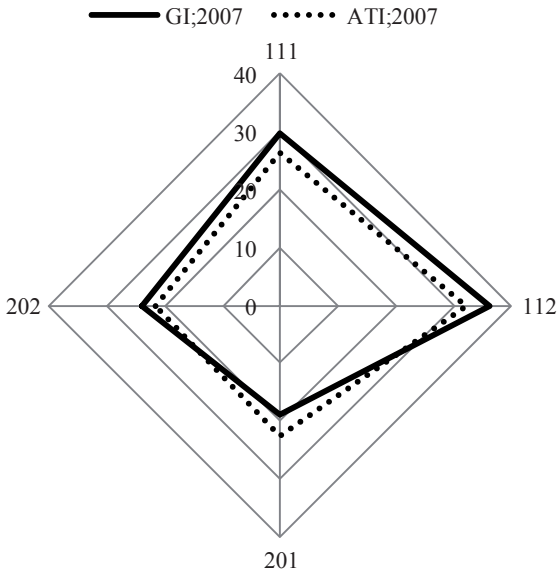
The impacts of the tax policy on (re)distribution of incomes demonstrate the following charts of Gini coefficients. Each chart contains for the given year all monitored households and for each of them are in each year plotted two points: for the gross income before taxes and benefits, the point P0 (plain line) and for the income after taxation, the point P1 (dotted line).



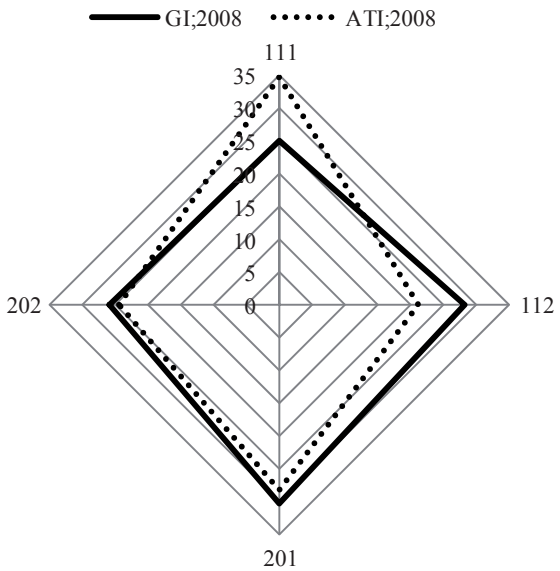
5: *Gini coefficients before and after taxes (GI, ATI): 2005*
Source: own calculation based on EU-SILC data (2006–2010)



6: *Gini coefficients before and after taxes (GI, ATI): 2006*
Source: own calculation based on EU-SILC data (2006–2010)



7: *Gini coefficients before and after taxes (GI, ATI): 2007*
Source: own calculation based on EU-SILC data (2006–2010)

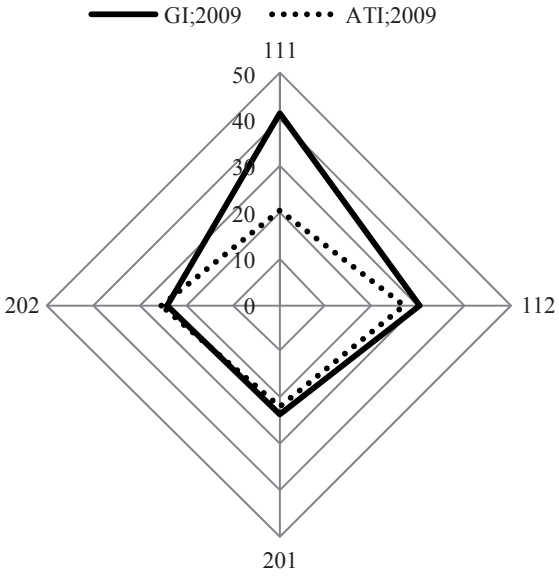


8: *Gini coefficients before and after taxes (GI, ATI): 2008*
Source: own calculation based on EU-SILC data (2006–2010)

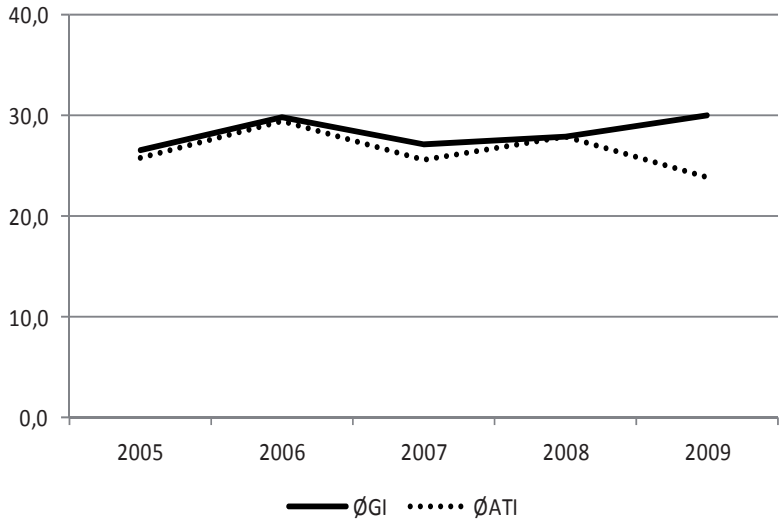
From the results for selected years (especially 2006 and 2008) it can be highlighted that:

- for all households any years 2005–2007 taxes did not change GC significantly, but taxes had different direction of influence,
- for households 111 a 112 an years 2008 and 2009 taxes significantly increased its influence, but for households 111 and year 2008 paradoxically taxes increased GC for ATI (in other cases decreased),
- taxes have decreased GC for ATI for all households in 2009.

Analyses and previous research (Vítek and Pavel, 2012; Vítek, 2012) show that the key redistribution factor is distribution of gross incomes among households. The tax (and also benefit) system corrects this distribution only slightly. It could be concluded that influence of the tax reform in 2005 has been insignificant and influence of the tax reform in 2008 has been much stronger, especially for households 111 a partly for households 112 (in year 2008).



9: *Gini coefficients before and after taxes (GI, ATI): 2009*
Source: own calculation based on EU-SILC data (2006–2010)



10: *Gini coefficients before and after taxes (GI, ATI)*
Source: own calculation based on EU-SILC data (2006–2010)

Following chart shows development of average GC for years 2005–2009 and selected households (111, 112, 201, 202). As one can see, main driver of the GC in years 2005–2008 had been change of gross income. However, the tax reform of the right government in 2008 influenced average GC for ATI substantially and has decreased it.

The last two charts present annual percentage changes of the GC: chart 11 contains data for gross incomes, chart 12 data for incomes after taxes and premia. The results show, that the tax reform in year 2005 rather increased inequality (GCs after tax have mostly increased) and the tax reform in year 2008 affected distribution of incomes in the same direction (with the exception of households 112).

RESULTS AND DISCUSSION

The analysis presented in this paper concentrated on the impact of the Czech tax and social insurance systems on distribution of incomes. Results for Lorenz curves show that taxes and insurance premia had less significant role in redistribution for households 201 and 202 and main driver of net income changes has been changes in gross incomes. Tax reforms between years 2005–2009 also did not changed significantly impact of taxes on redistribution of incomes.

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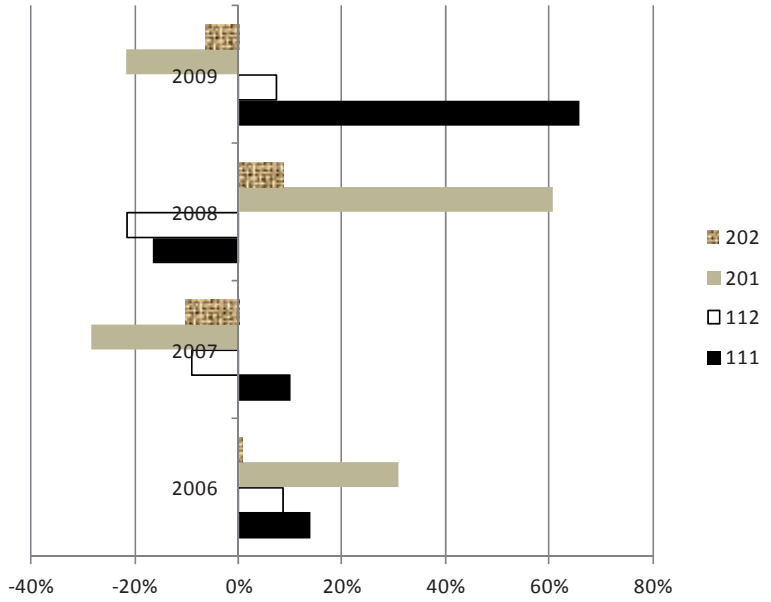
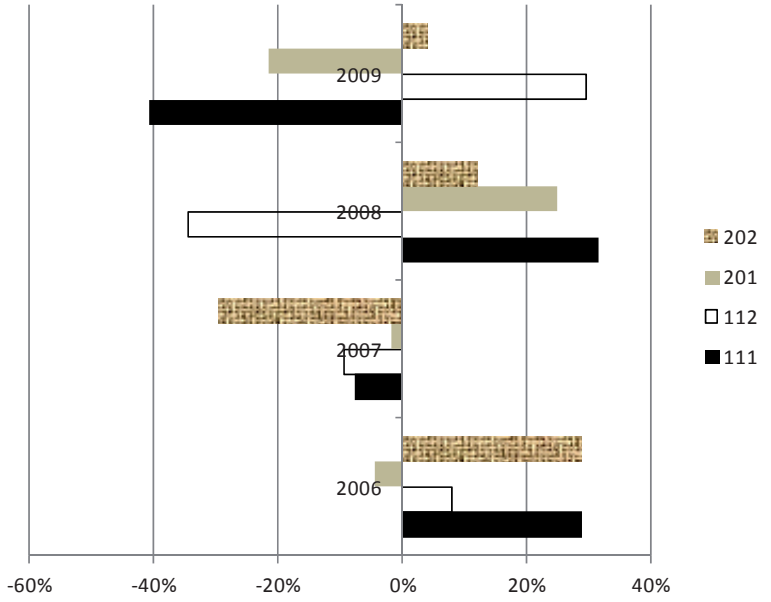


11: *Annual percentage changes of Gini coefficients before taxes (GI)*
Source: own calculation based on EU-SILC data (2006–2010)



12: *Annual percentage changes of Gini coefficients after taxes (ATI)*
Source: own calculation based on EU-SILC data (2006–2010)

corrects this distribution only slightly. It could be concluded that influence of the tax reform in 2005 has been insignificant and influence of the tax reform in 2008 has been much stronger, especially for households 111 a partly for households 112 (in year 2008).

Results from previous research also on Lorenz curves show (Vítek and Pavel, 2012) that benefit systems have generally greater impacts on the total net income than systems of personal income taxation and insurance premia and their importance is greater in the first two to three quintiles. For high-income households (the last quintile or decile), they do not have a direct redistribution impact (but they have an indirect one).

It was not conducted similar research in the Czech Republic for this period and therefore we cannot compare the results with other studies. For different households an years one could find similar analyses in Vítek and Pavel (2012) a Vítek (2012). However, we come to the same conclusion as the Večerník (2006): personal income tax reforms affect overall redistribution only to a limited degree.

SUMMARY

The paper deals with the distributive effects of taxes during last years in the Czech Republic. Using EU-SILC data for selected types of households, the paper assesses changes in the distribution of gross incomes and effects of the changes in taxes on the distribution of incomes after taxes. The analysis is carried out on different types of households. The analysis is performed using Lorenz curves and Gini coefficients. Results for Lorenz curves show that taxes and insurance premia had less significant role in redistribution for households 201 and 202 and main driver of net income changes has been changes in gross incomes. Tax reforms between years 2005–2009 also did not changed significantly impact of taxes on redistribution of incomes.

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REFERENCES

BÍLKOVÁ, D., 2012: Recent Development of the Wage and Income Distribution in the Czech Republic. *Prague Economic Papers* 21, 2: 233–250. ISSN 1210-0455.

BHATTARAI, K., WHALLEY, J. 2009: "Redistributive Effects of Transfer Programmes in the United Kingdom", *Economica New Series*, 76, 303: 413–431. ISSN 1801-0938.

EC, 2010: *Income and living conditions in Europe (EU-SILC 2009 and older).* Luxembourg: Eurostat. Available from http://epp.eurostat.ec.europa.eu/portal/page/portal/income_social_inclusion_living_conditions/data/database.

HINDLS, R., HRONOVÁ, S., SEGER, J. and FISCHER J., 2007: *Statistika pro ekonomy*. Praha: PROFESSIONAL PUBLISHING, 417 p. ISBN 978-80-86946-43-6.

KUBÁTOVÁ, K., 2010: *Daňová teorie a politika*. 5. aktual. vyd. Praha: Wolters Kluwer, 275 p. ISBN 978-80-7357-574-8.

MORIGUCHI, C., SAEZ, E., 2008: The Evolution of Income Concentration in Japan', 1886–2005: Evidence from Income Tax Statistics. *The Review of Economics and Statistics*, 90, 4: 713–734. ISSN 0034-6535.

NERUDOVÁ, D., 2011: *Harmonizace daňových systémů zemí Evropské unie.* 3. vyd. Praha: Wolters Kluwer, 320 p. ISBN 978-80-7357-695-0.

PIKETTY, T., SAEZ, E., 2007: How Progressive Is the U.S. Federal Tax System? A Historical and International Perspective. *The Journal of Economic Perspectives*, 21, 1: 3–24. ISSN 0895-3309.

SCHNEIDER, O., JELÍNEK, T., 2001: Vliv českého sociálního systému a daňových úlev na rozdělení příjmů. *Finance a úvěr – Czech Journal of Economics and Finance*, 51, 12: 639–657. ISSN 0015-1920.

SCHNEIDER, O., JELÍNEK, T., 2005: Distributive Impact of Czech Social Security and Tax Systems: Dynamics in Early 2000s'. *Prague Economic Papers*, 14, 3: 221–237. ISSN 1210-0455.

ŠIROKÝ, J. a kol., 2008: *Daňové teorie. S praktickou aplikací.* 2. vyd. Praha: C. H. Beck, 301 p. ISBN 978-80-7400-005-8.

SIROVÁTKA, T., VALENTOVÁ, M., 2002: Legitimita redistribuce: Česká republika v mezinárodním srovnání. *Finance a úvěr – Czech Journal of Economics and Finance*, 52, 2: 23–35. ISSN 0015-1920.

SOJKA, M., 2000: Transformation, integration and inequality: the case of the Czech Republic. *Prague Economic Papers,* 10, 4: 291–308. ISSN 1210-0455.

VEČERNÍK, J., 2002: Přerozdělování příjmů daněmi a dávkami v ČR: jeho proměny a reflexe po r. 1989 (Income Redistribution Via Taxes and Benefits in the CR: Change and Perception after 1989). *Finance a úvěr – Czech Journal of Economics and Finance*, 52, 1: 4–22. ISSN 0015-1920.

VEČERNÍK, J., 2006: Income Taxes and Social Benefits among Czech Employees Changes since 1989 and a Cross-national Comparison. *Finance a úvěr – Czech Journal of Economics and Finance*, 56, 1–2: 2–17. ISSN 0015-1920.

VÍTEK, L, PAVEL, J., 2012: Effect of Changes in Taxes and Benefits on Redistribution in the Czech Republic. In: ŠPALKOVÁ, D., FUROVÁ, L. (ed.). *Modern and Current Trends in the Public Sector Research*. Brno: Masarykova univerzita, pp. 155–163. ISBN 978-80-210-5715-9.

VÍTEK, L., 2012: Distributional Effects of Tax and Benefit Reforms in the Czech Republic. *World Academy of Science, Engineering and Technology* [online], 71, 0071: 454–460. ISSN 2010-376X.

VÍTEK, L., 2012a: Changes in the Taxation of Personal and Corporate Income in Developed Countries. *Acta Univ. Agric. et Silvic. Mendel. Brun,*, 60, 2: 465–474. ISSN 1211-8516.

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