

DIFFERENCES IN INCOME INEQUALITY UNDER RECESSION AND GROWTH: THE CASE OF THE CZECH REPUBLIC

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Abstract

The first part of the paper deals with factors which cause the difference between the gross domestic product and net national income in the Czech Republic. Applying both indicators, the contribution identifies the phases of the business cycle in the Czech Republic for the period 2008 – 2020.

The following parts of the paper show the influence of recession and economic growth on changes in income inequality. The second part of this paper deals with general changes in income inequality during the period 2009 – 2018. As instruments, Gini index and the share of gross money income of the lowest income decile to the highest income decile are applied.

In the third part of the contribution, there are analyzed the changes not only in the total gross money income of each two income groups but also fluctuations in four forms of gross money income (i.e. income from employment, income from self-employment, social income, and capital earnings) of these three income groups. Different shares in the total income and different developments of four types of gross money income allow explaining the changes in income inequality during the analysed period.

Keywords: income distribution, Czech Republic, recession, economic growth

JEL code: D310, J31

Introduction

By the French economist Thomas Piketty, the impact of different business cycle phases is not the same. He states “in economic booms, the share of profits in national income tends to increase, and pay at the top end of the scale (including incentives and bonuses) often increases more than wages toward the bottom and middle. The opposite trend occurs during economic slowdowns or recessions (of which war can be seen as an extreme form). Various noneconomic factors, especially political ones, ensure that these movements do not depend solely on the economic cycle.” (Piketty, 2013, p. 324).

The aim of analysis which results are presented in the contribution is to verify the Piketty’s statement. The question was whether the distinct economic phases have variant effects on income distribution in the Czech Republic. We will analyse income inequality in the Czech Republic until 2018. The question is whether the recession has a different impact on distinct

forms of income (profits, social benefits or wages). If yes, different changes in distinct incomes may result in lower income inequality during a recession and higher inequality during economic growth.

1 Economic fluctuations in the Czech Republic 2008 – 2020

The period 2008 to 2020 is characterised by one complete business cycle. The first question is to which phases to divide the cycle. By a standard view, expressed in the Samuelson's and Nordhaus' textbook, "modern analysts divide the business cycle into phases. "Peaks" and "troughs" mark the turning points of the cycles, while "recession" and "expansion" are the major phase" (Samuelson, P. A., & Nordhaus, W. D., 1989, p. 213).

By the standard statistical definition, "a recession is normally defined in terms of zero or negative growth of GDP in at least two successive quarters" (Newson, B., 2009).

If we apply this definition, we can identify two recessions in the Czech Republic in the analysed period. In Figure 1, the upper line visualises the development of the real gross domestic product in 2007 – 2020 years (data for the year 2020 are estimated by the Czech Ministry of Finance in April 2020).

For the first time, GDP declined in 2009 and then decreased again in the years 2012 and 2013. This decline we can regard as a special "double-dip" form of recession. In the context of a global coronavirus pandemic, there is regarded as a recession in 2020. So we can study a complete cycle, from the recession 2009 to the recession 2020.

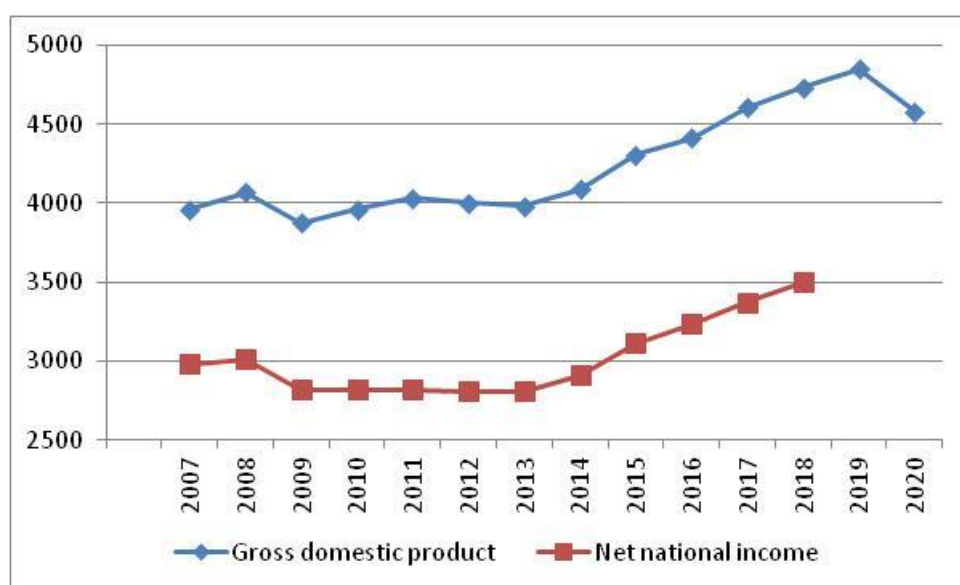
From the point of the subject of our research, the development of income inequality, we must give attention to the specific feature of the Czech Republic for recession 2009 – 2013. If we regard GDP development, the recession has a "double-dip" character.

But the character of recession 2009 – 2013 changes if we do not consider the depreciation of fixed capital assets and net receipts from abroad (i.e. compensation of employees, property income and net taxes less subsidies on production). In other words, we will consider the net national income (NNI). NNI is characterised by the bottom line in Figure 1. Mainly, due to the negative balance of receipts from abroad, NNI decreased for the whole period 2009 – 2013 and the "double-dip" character of the recession disappears from the national point of view.

Samuelson and Nordhaus distinguish two main phases of the business cycle - recession and expansion. For our purpose, we will divide the expansion phase into two parts. During the first part of the expansion, the GDP (or NNI) are growing but they do not reach the pre-recession

level. We will call this part of the business cycle as a recovery. If GDP (or NNI) overcome the pre-recession level we will regard this part of the business cycle as an expansion. Similarly, Burda and Wyplosz in their textbook write: „Especially important are turning points, peaks and troughs. As it runs up from a trough, this is the time of recovery, leading to an expansion” (Burda, M., & Wyplosz, C., 2005, p.333).

Fig. 1: Real GDP and net national income of the Czech Republic 2007 – 2020 (CZK, 2010 prices)



Source: own calculation, based on Public Database of the CZSO (2020)

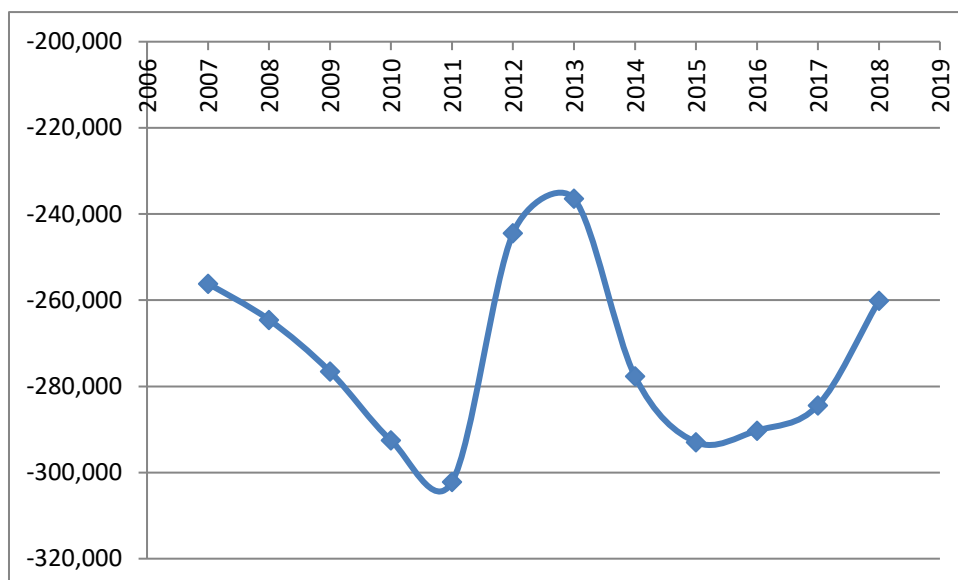
If we regard GDP, its 2008 level was overcome immediately in 2014 and the expansion covers years 2014 – 2019. If we regard NNI the situation is not so optimistic. The very slow recovery started in 2013 and the level of 2009 was overcome in 2015. The expansion is then connected only with four years 2016 – 2019.

The expansion finished in 2019 as the year 2020 is connected with the recession that was triggered by the coronavirus pandemic.

We will first justify the difference between GDP and NNI development. Theoretically, there are two reasons for this difference: the depreciation of fixed capital assets and primary incomes from (to) the rest of the world (compensation of employees, and property income). The Czech Republic has got for the whole period 2008 – 2019 the negative balance of primary incomes from abroad, i.e. net national income is lower than GDP. As illustrated in Figure 2, the negative balance for primary incomes paid abroad was growing in period 2008 – 2011, and in

2011, it reached the highest amount in the whole analysed period from 2008 to 2019 (in real terms).

Fig. 2: Net primary incomes from (+)/to (-) the rest of the world



Source: own calculation, based on Public Database of the CZSO (2020)

2 Income inequality: overall view

For the analysis purposes, we will express economic fluctuations by the changes in net national income. Then, we can divide the period into three parts: recession in the years 2009 – 2013, recovery in 2014 and expansion in the years 2015 – 2019. The contribution aims to analyse the influence of the recession 2009 – 2013 and economic growth 2014 – 2019 (i.e. recovery and expansion together) on income inequality in the Czech Republic.

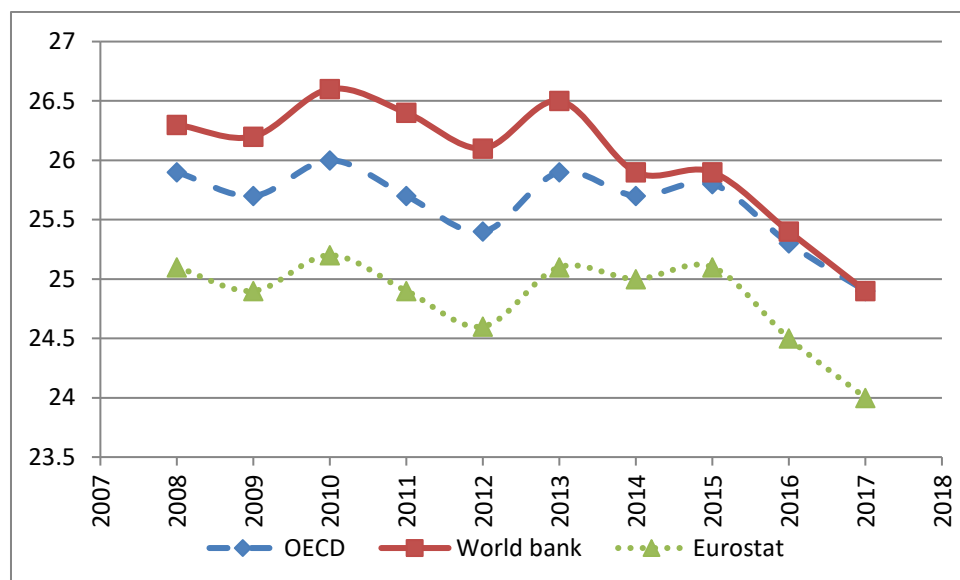
The first view will be general; we will apply the Gini index. Let's recall that the Gini index measures the extent to which the distribution of income among individuals (households) within an economy deviates from a perfectly equal distribution. If x_i is the wealth or income of person i , and there are n persons, the Gini coefficient G is possible to express by the formula:

$$x = \frac{\sum_{i=1}^n \sum_{j=1}^n |x_i - x_j|}{2 \sum_{i=1}^n \sum_{j=1}^n x_j} = \frac{\sum_{i=1}^n \sum_{j=1}^n |x_i - x_j|}{2n \sum_{i=1}^n x_i}$$

The Gini coefficient can theoretically range from 0 (complete equality) to 1 (complete inequality); in a percentage, it is ranging between 0 and 100. Theory suggests that the analysed number of households or individuals groups is very large. If it is not true the Gini for complete inequality is not equal to 1. For example, if we divide households into 5 groups and the richest

group owns all wealth or income the Gini index is only 0.8 or 80% in a percentage. But if we divide households into 10 groups and the richest group owns all wealth or income again the Gini index is 0.9 or 90%.

Fig.: 3: Gini indices for the Czech Republic, 2008 – 2017

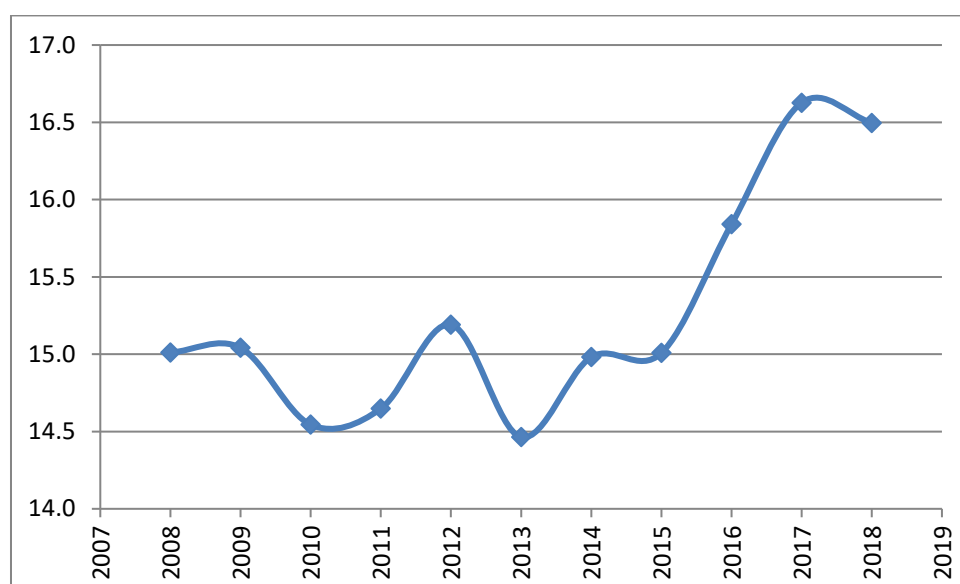


Source: Eurostat Database (2020), (2020), Income inequality OECD data (2020), The Gini coefficients of the World Bank for the Czech Republic. (2020)

Figure 3 displays the Gini coefficients for the Czech Republic published by three international institutions: OECD, Eurostat, and the World Bank. All these institutions agree the income inequity was relatively stable during recession years 2009 – 2013 (for example, the value of the Gini coefficient is between 24.6% and 25.2% by the Eurostat data). These institutions also agree the period of economic growth is connected with the decrease in income inequality.

The data of the Czech Statistical Office (CZSO) confirm this result. We computed the share of gross money income of the lowest decile to the highest decile for period 2008 – 2018. Figure 4 shows the share of the income of the lowest decile is increasing during the period of economic growth.

Fig. 4: Share of gross money income of the lowest decile to the highest decile, 2008 - 2018



Source: own calculation, based on (CZSO, 2020)

3 Income structure

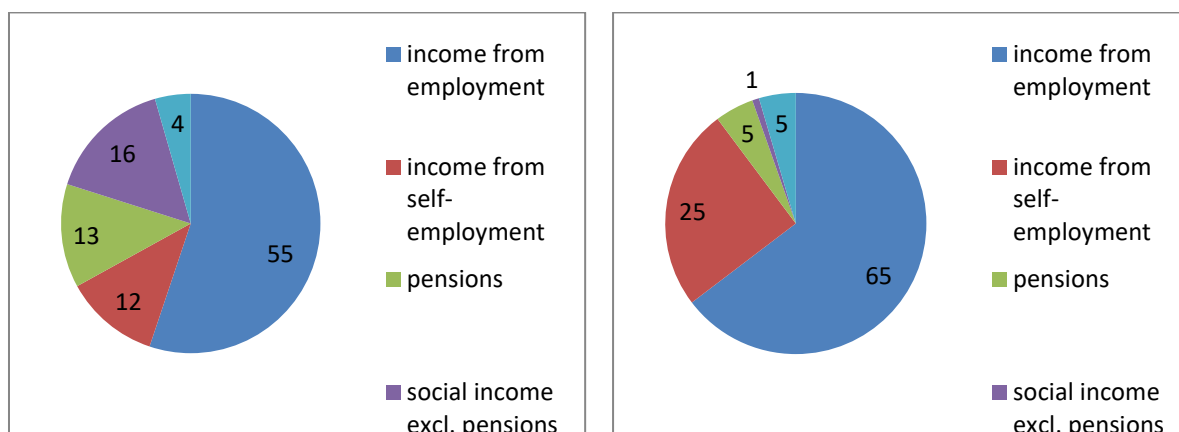
The next step of our analysis is focused on the structure of gross money income of households and we will try to identify the role of different types of income in this general changes in income inequality in the Czech Republic.

The CZSO distinguishes four types of income: income from employment, income from self-employment, social income and other income. Social income consists of pensions, health insurance benefits, child allowances, scholarships and other social benefits. The “other income” includes income from capital assets, i.e. interests on deposits, bond yields, dividends from shares, profits from companies, income from capital abroad, rental income, life insurance income and supplementary pension insurance income.

Households are divided by the CZSO into deciles by their gross money income. According to Piketty’s approach (Piketty, 2014), households are divided into three groups (or classes). Piketty defines the “lower class” as the bottom 50 per cent (individuals or households), the “middle class” as the middle 40 per cent (i.e. sixth, seventh, eighth and ninth 10%), and the “upper class” (top 10 per cent). He stresses the designations are quite arbitrary and open to challenge.

In the following analysis, we will compare the situation of the lowest 10% income decile as a representative of “lower class” and the top 10% or the “upper class”.

Fig. 5: Gross money income structure for lower (left) and upper decile (right), 2018, (%)



Source: own calculation, based on (CZSO, 2020)

For both groups, income from employment is crucial –it represents more than 50% of their total income. Social income is the second largest source for the lower class, It consists roughly from the same two parts – pensions and other social benefits (health insurance benefits, child allowances or scholarships). But for the upper class, the share of social income is marginal – both forms of social income represent together 6%. Pensions represent a dominant share of this source (5% of the total).

On the opposite side, income from self-employment plays more import role for the upper class (25% of total income) than for the lowest decile (12%). Other income has the same share for both groups (4% and 5% respectively).

It should not be forgotten that shares represent different amounts. For the lowest decile, gross money income per person was 95,980 CZK (i.e. about 8,000 CZK per month). For the upper class, gross money income per person was 581,815 CZK (i.e. about 48,500 CZK per month).

The absolute value is especially important for assessing the item “other income” which represents mainly income from capital assets but also life insurance income and supplementary pension insurance income. The lowest income decile consists of 1.4 million persons and the upper class only from 779 thousand persons. Other income per person is 4,275 CZK in the first group and 26,498 CZK for the second one. If we multiply these two numbers, we can simply find the total “other income” is 6 billion for the lowest income decile and 20.6 billion for the upper class.

4 Income inequality: wages, social income and income from self-employment

However, the distribution of income groups into deciles is not detailed enough to analyze the role of capital income sufficiently. The upper class consists of top managers (from private and public sectors) and entrepreneurs. As (Novokmet, 2017) mentioned, managers represent 9% of this ten per cent and capital owners are concentrated only to 1% the richest persons. For this reason, we will concentrate on the development of three forms of income: income from employment, income from self-employment, and social income. The share of all three forms of income represented 96% for the lowest income decile and 95% for the upper class of their total income in 2018.

The **income from employment** is a crucial source of income for both groups. As Table 1 shows, the income of the highest decile (represented mainly by top managers) was growing steadily between 2009 and 2018 (except 2012 and the stagnation in 2017).

Tab. 1: Income from employment (2010 prices)

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |
|-----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| lower ten | 33 943 | 34 317 | 30 572 | 32 700 | 33 947 | 32 524 | 33 945 | 35 638 | 40 953 |
| upper ten | 254 598 | 268 158 | 269 304 | 280 291 | 276 096 | 285 040 | 291 498 | 295 731 | 309 419 |
| | 2017 | 2018 | | | | | | | |
| lower ten | 44 201 | 46 757 | | | | | | | |
| upper ten | 310 916 | 332 318 | | | | | | | |

Source: own calculation, based on (CZSO, 2020)

The real wage of the lower class behaves in line with Keynesian wage theory (Soukup, J., Pošta, V., Neset, P., & Pavelka, T., 2018) in the recession 2009 – 2013. In 2009, the real wage increased and in the following years, it declined. The real wage reached its 2009 year level until 2015. Since 2015, the real wage of the lowest income decile is increasing considerably.

The difference between the levels of wages for both income groups is important. However, the wage growth rate was significantly higher for the lowest income decile throughout the whole period. Compared to the pre-recession year 2009, the income from employment in 2018 was higher by almost 38% for this group and by 30.5% for the upper class. In the recession 2009 – 2013, the income of the lowest income group was lowest in 2010. Compared to this year, the income from employment was higher by almost 53% for the lowest decile and by 23% for the highest decile in 2018.

The different growth rate of the income from employment in this period is a factor that can explain the decrease of income inequality (measured by the share of gross money income of the lowest decile to the highest decile) during years 2016 and 2017.

Social income is the second most important source for the lowest income decile. In the year 2018, it created 29% of total income (of which pensions accounted for 13% and other social income even 16%). As Table 2 shows, in the recession 2009 – 2013, their **pensions** fluctuate around the amount of CZK 7.500. After a slump in 2014 and 2015, pensions for this income group were significantly increased. In 2018, pensions were 75% higher than in 2015 (in real terms). As Table 3 shows, **other social income** (mainly health insurance benefits and child allowances) were steadily declining in the recession years 2009 – 2012 but in the year 2013, it returned on the pre-recession level in 2013. The decline in 2016 and 2017 is given by the growth of income from employment; many households thus ceased to meet the criteria for obtaining social benefits.

Pensions of the upper class were increasing in the years 2009 – 2011 but this growth was followed by a decrease in 2012 -2015. Since 2016, their pensions are increasing again. In the years 2016 – 2018, pensions of this social group have increased by 18.4%. **Other social income** is marginal for the upper class as it represents only 1% of their total income.

Tab. 2: Pensions (2010 prices)

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| lower ten | 7 371 | 6 705 | 7 403 | 7 237 | 7 482 | 7 491 | 6 464 | 6 268 | 7 706 | 9 067 | 10 967 |
| upper ten | 15 488 | 20 243 | 22 195 | 26 826 | 25 802 | 24 252 | 21 948 | 20 932 | 21 836 | 23 041 | 24 774 |

Source: own calculation, based on (CZSO, 2020)

The development of social income is the second reason for the decrease in income inequality (Pavelka, T.; Skála, M., Čadil, J., 2014). Social income is stable (in comparison with incomes from other sources). The growth of pensions for the lowest decile was also much larger than the growth of pensions for the highest income decile.

Tab. 3: Social income excl. pensions (2010 prices)

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| lower ten | 13 316 | 13 012 | 12 135 | 11 874 | 10 760 | 13 262 | 14 321 | 15 209 | 12 904 | 12 486 | 13 256 |
| upper ten | 5 187 | 5 006 | 6 848 | 4 741 | 3 897 | 3 604 | 4 296 | 3 334 | 4 905 | 3 840 | 4 369 |

Source: own calculation, based on (CZSO, 2020)

Income from self-employment is a more important source for the upper class. It represented 25% of their total income in 2018. As Table 4 shows, this form of income decreased permanently between 2009 and 2012 and reached its lowest level in 2013 and 2014. Since then, it has been increasing, but even in 2018, it did not reach the level of 2008. For the lowest income decile, income from self-employment represents 12% of their total income in 2018. In 2009 – 2012, this income remained approximately at the same level, but in 2013, there has been a significant decline. Since 2013 to 2017, income from self-employment is growing.

Tab. 4: Income from self-employment (2010 prices)

| | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| lower ten | 9 207 | 8 545 | 9 076 | 8 432 | 9 662 | 7 220 | 7 972 | 8 621 | 10 695 | 11 412 | 10 031 |
| upper ten | 146 | 119 | 111 | 103 | 100 | 106 | 104 | 116 | 116 | 118 | 129 |
| | 262 | 500 | 925 | 046 | 450 | 567 | 295 | 854 | 564 | 512 | 101 |

Source: own calculation, based on (CZSO, 2020)

However, income from self-employment has developed differently and more preferably for the lowest decile in the years after recession 2009 - 2013. It should be the third reason why income inequality in the Czech Republic decreased in the years 2016 and 2017.

Conclusion

Now, we can go back to the statement of French economist Thomas Piketty cited in the first paragraph of the contribution. Let's remember this statement supposes pay at the top end of the scale often increases more than wages toward the bottom and middle in economic booms and it also presumes opposite trend occurs during economic recessions.

For the recession 2009 – 2013 and the recovery in 2014, we found the stability of income inequality in the Czech Republic. The decrease of capital earnings and income from self-employment (which are more significant for the upper class than for other income groups) and stability of social income are beyond this process (for details, see also Soukup, 2018).

For the expansion phase of the business cycle, for years 2015 – 2018 we found the declining income inequality. We identify three reasons for this process:

- The wage growth rate was significantly higher for the lowest income decile than for the upper class throughout the whole period.
- Social income forms a larger share of total income for the lowest income decile than for the upper class. Social incomes are more stable in recessions (in comparison with

incomes from other sources). The growth of pensions for the lowest decile was also much larger than for the upper class during the expansion period.

- Income from self-employment forms the larger share of total income for the upper class than for the lowest income decile. Since 2014, it has been increasing, but even in 2018, it did not reach the level of 2008.

It can be stated that the hypothesis of the income inequality growth during economic expansion was not confirmed for the Czech Republic and the second decade of the twenty-first century.

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