Personal income tax reforms and tax progressivity in Slovenia, 1991-2012

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Abstract

Using two different data sets, both derived from the personal income tax files, this paper analyses income inequality and the effects of the personal income tax on after-tax income of employees in Slovenia. It has been shown by using the Kakwani index of progressivity that increases in tax progressivity came in leaps and bounds upon the introduction of new PIT legislation. After the early years of transition (1991-1993), characterized by a large increase in income inequality, the distribution of income has experienced rather small changes; this can be attributed to the introduction of the minimum wage and introduction of a tripartite institution (The Economic and Social Council), responsible for wage negotiations. Inequality of employee's income has even been decreasing since 2005; some of this decrease is due to changes in the tax base, as PIT legislation introduced schedular taxation of capital income in 2005 and differentiated tax allowances in 2008. The share of income accruing to the top 1% of earners has not been increasing, but has been fluctuating, though on a decreasing trend in the last 10 years.

Keywords: income inequality, income distribution, earnings, Slovenia

1 INTRODUCTION

The interest in income inequality is not waning. However, the focus of particular interest has been shifting, as researchers have in recent years devoted much attention to the analysis of the very top of the income distribution, and also by extension of the data series into the distant past. Our analysis does not include "the distant past", but only the period from 1991 onwards. This was the year Slovenia gained independence and introduced its – admittedly short lived – currency, the Slovenian tolar. In 2007, Slovenia joined the eurozone, adopting the euro. The economic and financial crisis hit Slovenia hard, with a large drop in GDP; the growth rates (as published by the Statistical Office and available at www.stat.si) were -7.8% in 2009, 1.2% in 2010, 0.6% in 2011 and 2.6% in 2012. In this sense, the 1991-2012 period was quite eventful. We note that any attempt to extend the analysis further back in time, to cover the pre-1991 period (when Slovenia was a constituent republic of the Yugoslavian federation), would entail insurmountable methodological difficulties. Namely, the socialist system did not recognize the concept of gross income, and there was no personal income tax in the modern sense of the word[1]. Thus, prior to 1991, only summary data on net wages are available.

Our analysis will deal with income inequality in the labour active population, more precisely, of employees. We generally do not use the term "earnings", though more than 95 percent of this income constitutes earnings; a quite small share of income also consists of income from capital. Self-employed persons, persons active in agriculture and other active persons, who do not have employee status, will not be included. Our analysis will take the individual as a statistical unit; we will

[1] Only certain types of income were taxed, i.e. income from contractual work.

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not deal with household income. In spite of this "partiality", such an analysis also provides an indication of what was happening at the household level, as wages and salaries account for more than 60 per cent of disposable household income. Changes in the distribution of these incomes also provide a good indication of the trend in the distribution of household incomes. As for the "partiality" of our analysis, we can quote Blinder (1993:308), who wrote, referring to the USA data, that "if you want to understand the rise in income inequality in the 1980s, the place to start is with the rise in wage inequality". To which we might add Atkinson's comment (1998:19): "I agree, but one should not stop here". To which we might further add that Atkinson at times "did stop here" and analyzed the distribution of individual earnings in twenty country members of the OECD (Atkinson, 2008).

We have already mentioned the strong research emphasis on the very top of the income distribution. Recent research by Atkinson, Piketty and Saez (2011), Piketty and Saez (2013), Alvaredo et al. (2013) has not only presented a comparative and historical perspective of changes at the top of the income distribution in a number of developed countries, but has also provided quite plausible explanations as to why the share of income accruing to the top 1% has increased so dramatically in most English-speaking countries. These authors have shown that the tax system is one of the "culprits", as large decreases in the top marginal tax rates have strongly stimulated managers and executives to bargain for higher remuneration, i.e. the rewards for bargaining efforts have significantly increased. They have shown that this increasing share is simply rent extraction, i.e. it was not caused by increases in the productivity of this group. In fact, this recent research, as well as the best-selling book by Piketty (2013), provides a strong theoretical and empirical "indictment" of the economic and financial elite in these countries, particularly in the USA. Viewed in this international context, and considering the above-mentioned research that will doubtlessly have a strong impact on the research agenda for years to come, it is important to analyse and provide plausible explanations for the income inequality dynamics in other countries. These analyses have to be similarly based on high quality data, enabling a thorough analysis of the top of the income distribution. In a sense, the above-cited research provides a broader context for our national research. We also note that our research represents a continuous endeavour, with some results being presented in Stanovnik and Verbič (2005, 2013).

The structure of our analysis is as follows. Section 2 will present both data sources used in our analysis. Section 3 will provide a comparison of average wages from these data sources and from the official source – the Statistical Office of the Republic of Slovenia. In section 4, we will present the structure of gross income of employees: personal income tax (PIT), social security contributions and net income, net income being obtained by subtracting PIT and social security contributions from gross income. The distribution of gross income across income quintiles is presented, as well as the distribution of PIT. We show that the changes in the

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share of PIT paid, by income quintiles, can clearly be traced to changes in the PIT legislation. This legislation has – through the years – strongly emphasized the lowering of the tax burden for the low-income population. Section 5 is devoted to the analysis of income inequality and the role of the tax system in mitigating the effects of the rise in inequality of the distribution of gross income. Section 6 presents a brief analysis of the dynamics of PIT progressivity, using the Kakwani index as a measure. Section 7 offers some concluding remarks.

2 DATA SOURCES

Our analysis is based on two data sources. Neither of these is available to the general public; they have been acquired (specifically for this research) from the Statistical Office of the Republic of Slovenia (SORS) and the Tax Administration of the Republic of Slovenia (TARS).

Data source A

This data source was obtained from SORS. Using the statistical registry of the labour active population (*Statistični register delovno aktivnega prebivalstva – SRDAP*) and tax file returns from TARS, a population of employees was extracted for each year, satisfying both of the following criteria: (a) employed full-time (meaning that the data in the registry indicate that the person is working at least 36 hours per week), and (b) employed at the same employer throughout the year. The data are delivered in tabular form with 14 income groups. There is differentiation according to the sector of employment (private, public) and gender (male, female), so that there are in effect four tables for each year. The tables include all (itemized) sources of income subject to tax, as well as withheld PIT and employee social security contributions. The tables cover the period from 1993 to 2012.

Data source B

This data source was obtained from TARS. These are actually large random samples extracted from the PIT files, i.e. covering all persons liable for PIT. Each of these annual samples includes about 60,000 taxable persons, representing some 5 per cent of all persons liable for PIT. For the 2005-2012 period, TARS provided an even larger random sample, covering some 10 per cent of persons liable for PIT. Data for each person include the following: age of birth, sex, gross income (for each income source subject to tax), employee social security contributions, withheld PIT and final PIT liability. This data source covers the period from 1991 to 2012.

Both data sources have their "strong" and "weak" selling points. In view of Atkinson's A/B/C classification[2] (Atkinson, 2007; 2008), both sources could be classified in the A group, signifying high quality data. Data source A offers possibilities for comparisons between the public and private sector – something that data

[2] "An A classification denotes data that are most appropriate, B denotes acceptable, if not ideal, data that may be applied *faute de mieux*, and C denotes data that should not be used" (Atkinson, 2008, p.19). A more detailed description of the classification criteria is presented in the source cited above.

source B does not provide. However, data source A starts with 1993, and thus does not cover the most dramatic early period of transition from a socialist to a market economy. In addition, this data source contains only data on withheld PIT and not data on final PIT liability. In view of the described selection rules, data source A contains a fairly homogeneous population of employees.

As data source B represents a random sample of all persons liable for PIT, employees have to be extracted. Furthermore, there is no information on sector of employment (public, private). Additionally, there is no information on the period within the year, during which the income has been earned; source A solves this problem by including only employees who have worked during the whole year. Thus a person could have earned income only during two months and still be included in the PIT file[3]. Needless to say, his annual income (earned during two months) is low as well as his average monthly income. However, the advantage of this data source is that it starts with 1991 and contains data on the final PIT liability. Furthermore, employees whose annual earnings are less than the personal allowance are not required to file a PIT return and are included neither in data source A nor in data source B[4]. As data source B is a sample, the estimated values of various indicators are subject to sampling errors; due to the large samples the estimated standard errors of estimates are rather small.

3 A COMPARISON OF THE AVERAGE WAGE, BASED ON THE DATA SOURCES AND OFFICIAL STATISTICS

In this section, we will provide a comparison of the values of the average wage, based on data source A and data source B. In computing the average monthly wage, data source A does not include employees who have: (a) worked part-time, (b) not worked the whole year, and (c) changed their employer in a given year.

What about data source B? We first extracted employees according to the single criterion that wages and/or wage compensations received by the person in a given year must be positive. In previous research (Stanovnik and Verbič, 2005) we extracted employees according to two cumulative criteria: (a) value of wages and/or wage compensations is positive, (b) value of vacation allowance is positive. We have set the second criterion because the vacation allowance is a statutory element of the labour compensation package, with minimum amounts of these vacation allowances being the result of negotiations between the social partners and spelled out in collective agreements[5]. If the worker is employed part-time, he is entitled to

[3] Of course, this person will be included in the PIT file only if gross annual incomes exceed the amount of the general personal allowance. This allowance is in the form of a deduction.

[4] The personal allowance has been increasing, with particularly large leaps in 2008 and 2010. Thus, in 2010 a person receiving a minimum wage (throughout the year) would still be liable for PIT, but his PIT liability would amount to only some 110 EUR.

[5] There are also strong inducements to disburse only minimum amounts of these vacation allowances. Namely, from 1994 onward amounts of vacation allowance greater than the stipulated minimum amount were subject to corporate income tax. From 1998 onward, values that surpassed the stipulated minimum amount were also subject to social contributions.

receive an appropriate part of the annual vacation allowance[6]. Similarly, if a worker is employed by an employer, e.g. for three months in a year, he is entitled to 3/12 of the minimum amount.

Table 1

The average monthly wage according to different data sources (in EUR), 1991-2012

Year	Statistical Yearbook	Data source A	Data source B
1991	495		453
1992	486		431
1993	570	586	516
1994	621	621	545
1995	731	711	634
1996	762	729	658
1997	800	751	682
1998	849	817	727
1999	895	860	770
2000	935	901	808
2001	988	950	851
2002	1,041	1,005	905
2003	1,083	1,063	949
2004	1,120	1,094	986
2005	1,157	1,150	1,052
2006	1,213	1,213	1,116
2007	1,285	1,286	1,184
2008	1,391	1,400	1,286
2009	1,439	1,478	1,319
2010	1,495	1,513	1,368
2011	1,525	1,559	1,378
2012	1,525	1,559	1,396

Source: Statistical Yearbook of the Republic of Slovenia (SORS, 1992-2013); own computations from data sources A and B.

Regardless of these legal obligations, it appears that numerous employers are in breach of the law and do not disburse vacation allowances to their workers; our estimates indicate that some 10 per cent of all workers do not receive these allowances. Excluding this group of workers from our analysis does not seem warranted, in spite of the fact that their wages are quite low and that – in all likelihood – they are being employed part-time and/or for only several months during the

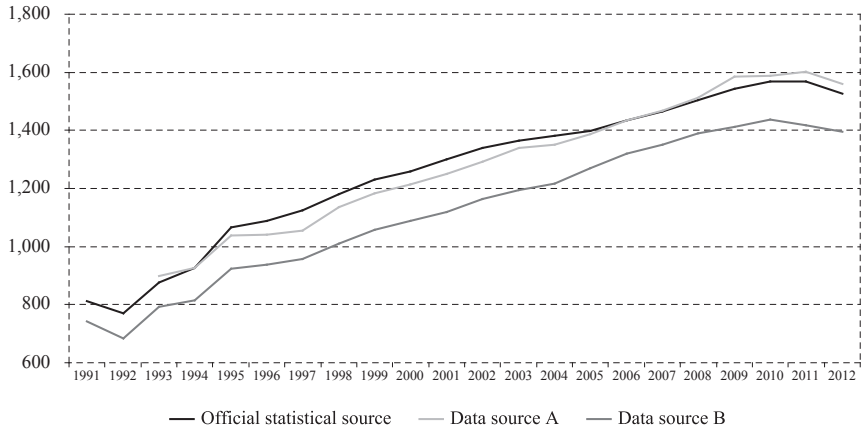
[6] Some categories of part-time workers are entitled to a full vacation allowance. These are workers who are partially disabled and receive part of their wage compensation from the Institute for pension and disability insurance (*Zavod za pokojninsko in invalidsko zavarovanje – ZPIZ*).

year. The inclusion of these workers in the computation of the average wage also results in lower estimates of the average wages.

A comparison of wages includes the values of the official average gross monthly wage, published in the Statistical Yearbook of the Republic of Slovenia, with the computed average gross monthly wage from data sources A and B. It must be noted that the official average gross wage is actually being computed on a subset of all employees. Thus, in 1991 employees in private enterprises and employed by the self-employed were not taken into account. The subset was enlarged in 1992, when employees in larger private enterprises (with at least three employees) were included. Since 2005, all employees in private enterprises have been included in the official calculation of the average wage, so that the only excluded group is of employees working for the self-employed[7]. As a rule, these workers have low reported wages, due to the possibilities for payments to be made in cash. Because this group of workers was excluded from the computation of the official average wage, it is not surprising that the official average wage is somewhat higher than the average wage computed from data source A, as seen from table 1.

Figure 1

The average gross wage (in 2012 prices) in EUR, 1991-2012



Source: Statistical Yearbook of the Republic of Slovenia (SORS, 1992-2013); own computations from data sources A and B.

The lowest estimated values of the average wage are according to data source B. Here, the average monthly wage is computed by dividing the annual value of wages (as specified in the PIT tax form) by 12. Since we do not know how many months the person has actually been working, or whether he has been working

[7] In computing the official average wage, all workers in the above stated subset are included. This means the inclusion of workers working part-time or full-time, workers on a permanent or temporary labour contract. A person who worked only two months would have his average wage computed on the basis of these two months.

full-time or part-time, we simply assume that the person has been working full-time during the year.

In spite of these differences in the data sets, we can observe from figure 1 a quite consistent trend for the average wage (in real terms) from all the three statistical sources. The average wage has been steadily increasing (in real terms) since 1992, with the economic and financial crisis resulting in a slight decrease in 2011 and 2012.

4 THE STRUCTURE OF GROSS INCOME: PIT, EMPLOYEE SOCIAL CONTRIBUTIONS AND NET INCOME

Though gross incomes of employees were on the increase in the 1992-2010 period, the increase in their net incomes was even more pronounced, as seen from tables 2 and 3, which show an increasing share of net income in the gross income of employees[8]. As data source A does not contain data on final PIT, the actual net income could not be computed. That is why we refer to "net" income, obtained by subtracting withheld PIT and employee social contributions from gross income. This is seen in table 2. Table 3 is based on data source B; here net income is obtained by subtracting actual PIT paid and employee social contributions from gross income.

As seen from table 3, the share of PIT in the gross income of employees decreased from 14.9 per cent in 1991 to 12.3 per cent in 2012, whereas the share of employee social contributions decreased from 22.9 per cent to 20.1 per cent of gross income in the same time period. Both decreasing shares are due to legislative changes[9]. Decreases in the share of PIT occurred in 1994, 2005 and 2007, i.e. the years when new PIT legislation was introduced. A decreasing share of employee social contributions is visible in the first years of transition, up to 1995, caused by the gradual decrease in the statutory employee social contribution rate, from 24.79 per cent in 1992 to 22.10 per cent in 1995.

In order to provide a better basis for comparison, we also computed the share of withheld PIT in gross income of employees from data source B. A comparison with data source A is provided in figure 2, which, again, shows remarkable congruence.

The period since 1991 witnessed not only large aggregate changes in the PIT burden and (in the initial years) changes in employee social contributions, but also changes in the PIT burden across income groups, as can be observed from tables

[8] Wages account for some 90 per cent of employees' gross income, with vacation allowance accounting for a further 5 per cent.

[9] In principle, the decreasing share of employee social contributions could also have been due to changes in the income composition, say, with an increasing share of income from capital in gross income of employees. This income is not subject to social contributions. However, this was not the case.

4 and 5, with table 4 including only withheld PIT (data source A) and table 5 including final paid PIT (data source B).

Changes in the PIT burden across income groups can occur through several channels: (a) legislative changes in the PIT, which include changes in tax brackets, tax rates and tax reliefs, (b) changes in the income distribution, and (c) indexation rules for tax brackets.

Starting from the third possible cause for changes in the tax burden, i.e. indexation rules, we note that up to 2004, the tax brackets were annually adjusted according to the growth of the average wage. The PIT Act, passed in May 2004 (ZDoh-1, Official Gazette of the Republic of Slovenia 54/2004) changed the indexation rule, so that tax brackets were uprated according to the consumer price index. Such indexation has also been retained by the PIT legislation passed in 2006 (ZDoh-2, Official Gazette of the Republic of Slovenia 117/2006). Thus, a growth of wages higher than the increase in consumer prices would cause a gradual drift of employees into higher tax brackets; this is known as fiscal drag.

Table 2

Withheld PIT, employee social contributions and "net" income as a share of gross income of employees, data source A

Year	Gross income	Withheld PIT	Employee social contributions	"Net" income
1993	1.000	0.140	0.218	0.642
1994	1.000	0.142	0.205	0.654
1995	1.000	0.143	0.200	0.658
1996	1.000	0.146	0.198	0.656
1997	1.000	0.145	0.198	0.657
1998	1.000	0.147	0.202	0.652
1999	1.000	0.148	0.202	0.649
2000	1.000	0.150	0.204	0.647
2001	1.000	0.150	0.204	0.646
2002	1.000	0.151	0.204	0.645
2003	1.000	0.152	0.204	0.644
2004	1.000	0.152	0.203	0.645
2005	1.000	0.142	0.201	0.657
2006	1.000	0.144	0.204	0.653
2007	1.000	0.131	0.204	0.665
2008	1.000	0.134	0.204	0.662
2009	1.000	0.136	0.206	0.658
2010	1.000	0.135	0.206	0.659
2011	1.000	0.137	0.204	0.659
2012	1.000	0.135	0.204	0.662

Note: "Net" income refers to gross income minus withheld PIT minus employee social contributions.

Source: Own computations from data source A.

TABLE 3

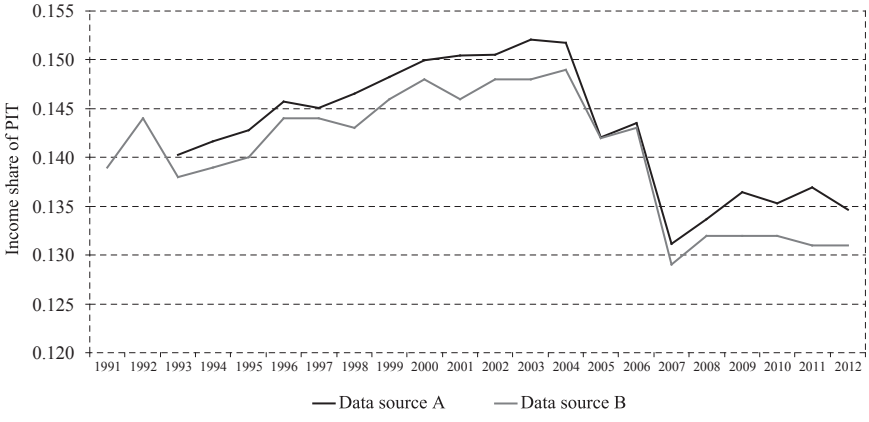
PIT, employee social contributions and net income as a share of gross income of employees, data source B

Year	Gross income	PIT	Employee social contributions	Net income
1991	1.000	0.149	0.229	0.623
1992	1.000	0.146	0.226	0.628
1993	1.000	0.147	0.217	0.636
1994	1.000	0.136	0.203	0.661
1995	1.000	0.139	0.197	0.664
1996	1.000	0.141	0.195	0.664
1997	1.000	0.140	0.195	0.664
1998	1.000	0.138	0.199	0.663
1999	1.000	0.139	0.200	0.661
2000	1.000	0.139	0.200	0.661
2001	1.000	0.138	0.202	0.660
2002	1.000	0.141	0.201	0.658
2003	1.000	0.141	0.201	0.658
2004	1.000	0.143	0.201	0.657
2005	1.000	0.133	0.199	0.668
2006	1.000	0.133	0.201	0.665
2007	1.000	0.126	0.201	0.673
2008	1.000	0.128	0.201	0.672
2009	1.000	0.126	0.203	0.671
2010	1.000	0.125	0.202	0.673
2011	1.000	0.124	0.201	0.675
2012	1.000	0.123	0.201	0.676

Source: Own computations from data source B.

FIGURE 2

The share of withheld PIT in gross income of employees, 1991-2012



Source: Own computations from data sources A and B.

TABLE 4

The structure of withheld PIT across income quintile groups, data source A

Year	Lowest 20%	Quintile groups 2 to 4	Highest 20%	Top 5%	Top 1%
1993	7.33	45.64	47.03	21.03	7.34
1994	5.56	41.36	53.08	26.00	9.58
1995	5.48	40.61	53.91	26.55	9.58
1996	5.55	40.15	54.30	26.87	9.76
1997	5.44	39.92	54.63	27.22	10.00
1998	5.47	39.36	55.17	27.70	10.64
1999	5.33	38.82	55.85	28.13	10.78
2000	5.34	39.19	55.47	27.81	10.72
2001	5.42	38.85	55.73	27.67	10.66
2002	5.51	39.22	55.27	27.12	10.59
2003	5.49	39.08	55.43	26.86	10.45
2004	5.69	39.12	55.18	26.48	10.34
2005	4.67	37.73	57.60	27.94	11.06
2006	4.65	38.45	56.91	27.11	10.59
2007	4.85	37.38	57.77	28.78	11.47
2008	4.33	38.00	57.66	28.35	10.92
2009	4.06	39.17	56.77	27.34	10.12
2010	4.21	38.97	56.81	27.07	9.80
2011	4.26	40.15	55.60	26.42	9.65
2012	4.56	40.54	54.90	26.15	9.60

Source: Own computations from data source A.

Changes in the income distribution can also cause changes in the relative tax burden. Thus, the rapid increase in income inequality in 1992 and 1993 resulted in a visible increase in the share of PIT paid by the highest quintile group.

However, there is no doubt that the largest changes in the shares of PIT paid across income groups were due to legislative changes. A "quantum leap" occurred in 1994, when the new PIT legislation entered into force (ZDoh, Official Gazette of the Republic of Slovenia 71/93). This PIT legislation introduced significant changes in the tax brackets and tax rates. However, of particular importance was the introduction of a personal allowance, amounting to 11 per cent of the average national annual wage. Thus, the tax burden of low-income groups decreased, whereas the burden for higher income groups increased.

A further large decrease in the relative tax burden of low-income groups occurred with the passage of the *Law on extraordinary decrease of tax liability* (ZIZDO), passed in May 2000 (Official Gazette of the Republic of Slovenia 44/2000). This law had a retroactive effect for PIT liability for the year 1999, and was also applied

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for the tax year 2000. It prescribed lower tax liabilities for low-income groups: this was a pre-election manoeuvre by the government of Dr Janez Drnovšek. As this law was of limited duration, and as the elections were won by the party of Dr Janez Drnovšek, there was no strong motivation to extend the law's validity. Thus, in 2001 the relative tax burden of the low-income group (bottom quintile group) returned to its pre-1999 value. Further changes occurred in 2005, when new PIT legislation (ZDoh-1) entered into force; this caused a sizeable increase in the personal allowance. The frenzy continued toward the end of 2005 with the introduction of schedular taxation of most forms of income from capital (Official Gazette of the Republic of Slovenia 115/2005). Interest income, dividends and capital gains were henceforth taxed with a final withholding tax amounting to 20 per cent, and since 2006, these incomes are not included in the PIT tax form.

Table 5

The structure of paid PIT across income quintile groups, data source B

Year	Lowest 20%	Quintile groups 2 to 4	Highest 20%	Top 5%	Top 1%
1991	6.61	49.36	44.03	19.01	6.99
1992	5.60	47.54	46.86	21.62	8.28
1993	5.26	46.73	48.01	22.31	8.37
1994	2.31	39.67	58.02	29.48	11.70
1995	2.37	39.30	58.33	29.50	11.23
1996	2.43	38.15	59.42	30.51	12.03
1997	2.37	37.71	59.93	31.29	12.38
1998	2.43	37.34	60.23	31.66	13.18
1999	1.10	36.71	62.19	33.12	13.51
2000	1.01	36.49	62.49	33.54	14.29
2001	2.30	36.97	60.74	31.25	12.55
2002	2.28	36.46	61.26	31.75	12.89
2003	2.31	36.85	60.84	31.32	13.06
2004	2.34	36.58	61.08	31.91	13.49
2005	1.55	34.42	64.02	33.52	14.08
2006	1.74	35.19	63.07	32.50	13.70
2007	2.01	34.86	63.14	33.44	13.33
2008	0.86	35.01	64.13	33.95	13.63
2009	0.72	35.23	64.04	33.12	13.01
2010	0.37	34.81	64.82	33.73	13.27
2011	0.51	36.11	63.39	32.14	12.09
2012	0.47	35.87	63.67	32.52	12.63

Source: Own computations from data source B.

In 2007, a new PIT Act (ZDoh-2) entered into force (Official Gazette of the Republic of Slovenia 117/2006). It simplified the system by reducing the number of tax brackets from five to three and reduced the top marginal rate from 50 to 41 per cent. Legislative changes continued, and in the beginning of 2008 (Official Ga-

zette of the Republic of Slovenia 10/2008) important changes were introduced, with a differentiated personal allowance; the higher the income, the lower the personal allowance[10]. Quite possibly, the rationale for such a "bizarre" tax allowance, unknown in fiscal doctrine, was the approaching parliamentary elections. Of course, the relative tax burden of the low-income group (bottom quintile group) experienced a further decrease (see also Majcen et al., 2009; Čok, Urban and Verbič, 2013). It is amazing that diminution of the already low tax burden of the low-income groups did not stop here, and in 2010 legislation was passed (Official Gazette of the Republic of Slovenia 13/2010) which significantly increased the tax allowance for the lowest income group. To sum up, the share of PIT paid by these income groups in Slovenia is now at a historic low.

5 INCOME INEQUALITY

Tables 6 and 7 present the distribution of income (of employees) across quintile groups, with table 6 referring to data source A and table 7 to data source B. In both tables, we further divide the top quintile group into the top 5% and top 1% of employees.

Both tables show that the share accruing to the bottom income quintile group has not changed by much, and income share of quintile groups 2 to 4 has somewhat decreased. The share accruing to the top income quintile group has slightly increased. However, these assertions depend on the base year of comparison. If we discard the first three years of transition, i.e. the 1991-1993 period, the changes in the distribution of income are rather small. However, both data sources (A and B) do show some changes at the top of the income distribution. According to data source A, the share of total gross income accruing to the top income quintile group gradually increased in the 1993-1999 period. After that, it was on a declining trend, so that the overall income share of the top quintile group increased by only 0.81 percentage points in the 1993-2012 period. The income share of the top 1 percent increased by 0.32 percentage points in this time period.

A similar trend can be discerned from table 7, which shows the distribution of income of employees according to data source B. According to this data source, the income share of the upper quintile group increased in the 1993-2000 period, followed by declining trend, so that the income share of this income group increased by only 0.83 in the 1993-2012 time period. Similarly, the increases in the income share accruing to the top 1 percent were also small, the overall increase in the 1993-2012 period being only 0.37 percentage points.

Tables 8 and 9 provide summary measures of income inequality, based on data source A and data source B, respectively. We observe that the Gini coefficient based on data source B is consistently higher than the Gini coefficient based on

[10] Taxpayers with an annual gross income up to 6,800 EUR were entitled to a personal allowance (deduction) of 4,959.60 EUR. Taxpayers with an annual gross income from 6,801 to 9,000 were entitled to a personal allowance of 3,959.60 EUR, whereas taxpayers with an annual gross income greater than 9,001 EUR were entitled to a personal allowance amounting to 2,959.60 EUR.

data source A (see also figure 3). This is not surprising, as data source B contains a more heterogeneous group of employees, many of whom have low wages. The narrative of both tables is similar; the Gini coefficient peaked in the late 1990s[11], followed by a declining trend during the 2000s.

Table 6

The structure of gross income of employees, by income quintile groups, data source A

Year	Lowest 20%	Quintile groups 2 to 4	Highest 20%	Top 5%	Top 1%
1993	9.60	52.27	38.13	14.83	4.69
1994	9.66	51.65	38.69	15.76	5.09
1995	9.33	51.40	39.27	16.05	5.08
1996	9.34	51.00	39.66	16.37	5.27
1997	9.16	51.02	39.82	16.50	5.35
1998	9.21	50.58	40.21	16.82	5.66
1999	9.01	50.18	40.81	17.24	5.84
2000	9.06	50.27	40.67	17.05	5.76
2001	9.16	49.93	40.91	17.03	5.75
2002	9.25	50.12	40.63	16.73	5.69
2003	9.23	49.90	40.87	16.75	5.70
2004	9.42	49.73	40.85	16.69	5.72
2005	9.44	49.79	40.77	16.63	5.81
2006	9.48	50.15	40.37	16.13	5.43
2007	9.34	50.08	40.59	16.45	5.75
2008	9.21	50.27	40.51	16.35	5.58
2009	9.00	50.79	40.21	16.03	5.30
2010	9.60	50.49	39.91	15.78	5.11
2011	9.77	50.87	39.37	15.58	5.09
2012	10.03	51.03	38.94	15.37	5.01

Source: Own computations from data source A.

What is the explanation for the large increase in the value of the Gini coefficient in the early 1990s, i.e. in the 1991-1993 period? There is little doubt that wage compression and "egalitarianism" of the socialist and self-management period "broke loose" in these early years, resulting in a significant increase in wage dispersion. This increase can be ascribed also to the poorly regulated (or rather unregulated) institutional setting, so characteristic for the early transition period in many Central and Eastern European countries. Mechanisms for negotiations between social partners were introduced in 1994 – with the formation of the Economic and Social Council, a tripartite body comprising trade union organisations, employer organizations and the government[12] (Štoka-Debevec, 1997:176). An

[11] We do not have a satisfactory explanation for the increase in income inequality in the late 1990s.

[12] Perhaps one could use the term "re-introduced", as the trade unions had a very important role in the socialist and self-managed period.

agreement on wage policy, duly signed by the social partners was also passed in 1994. In 1995, the National Assembly of the Republic of Slovenia (*Državni zbor*) passed a law with a long-winded title, *The law on promulgation of the agreement on wage policy and other labour remuneration and the social compact for 1995 and the setting of minimum and maximum wage* (Official Gazette of the Republic of Slovenia 29/95). This marked the first minimum wage legislation. For the following year, 1996, the minimum wage was stipulated in the social compact and the law on the promulgation of the social compact. Starting from 1997, the minimum wage was set in a special law on the minimum wage. The minimum wage legislation might also have contributed to wage compression in recent years, as the *Law on minimum wage*, passed in February 2010 (Official Gazette of the Republic of Slovenia 13/2010) mandated an important – though gradual – increase in the minimum wage. The increase in the share of income accruing to the bottom quintile group, starting from 2010 (see tables 6 and 7) is – quite possibly – due to this new legislation.

Table 7

The structure of gross income of employees by income quintile groups, data source B

Year	Lowest 20%	Quintile groups 2 to 4	Highest 20%	Top 5%	Top 1%
1991	8.36	54.07	37.57	14.23	4.52
1992	7.64	53.16	39.20	15.58	5.15
1993	7.20	52.79	40.01	16.04	5.25
1994	7.11	52.30	40.59	16.91	5.65
1995	7.20	51.83	40.97	17.09	5.53
1996	7.33	51.05	41.62	17.56	5.87
1997	7.37	50.86	41.77	17.82	5.94
1998	7.46	50.64	41.90	18.00	6.32
1999	7.26	49.99	42.74	18.62	6.41
2000	7.22	49.96	42.82	18.75	6.73
2001	7.51	50.17	42.32	17.90	6.08
2002	7.49	49.81	42.69	18.21	6.24
2003	7.52	49.99	42.49	17.99	6.29
2004	7.58	49.66	42.76	18.34	6.53
2005	7.64	49.84	42.52	18.06	6.35
2006	7.93	49.95	42.12	17.64	6.21
2007	8.14	50.05	41.81	17.45	6.04
2008	8.12	49.95	41.93	17.62	6.13
2009	8.03	50.03	41.93	17.28	5.93
2010	8.29	50.08	41.63	17.25	5.93
2011	8.48	50.63	40.89	16.58	5.48
2012	8.49	50.67	40.84	16.60	5.62

Source: Own computations from data source B.

TABLE 8

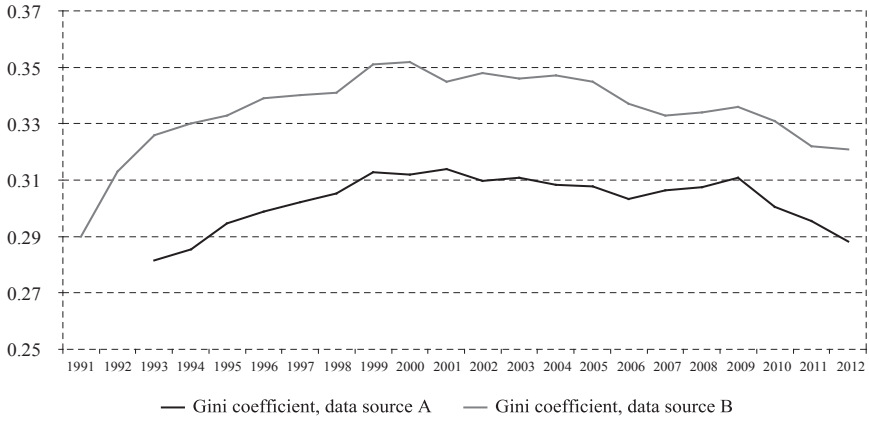
The Gini coefficient for gross income and concentration coefficients for withheld PIT, employee social contributions and "net" income, data source A

Year	Gini coefficient for gross income	Concentration coefficient for withheld PIT	Concentration for employee social contributions	Concentration coefficient for "net" income
1993	0.282	0.389	0.279	0.259
1994	0.285	0.464	0.282	0.248
1995	0.295	0.472	0.293	0.257
1996	0.299	0.476	0.295	0.261
1997	0.302	0.480	0.297	0.265
1998	0.305	0.485	0.302	0.266
1999	0.313	0.492	0.309	0.273
2000	0.312	0.490	0.310	0.272
2001	0.314	0.491	0.312	0.273
2002	0.310	0.486	0.308	0.269
2003	0.311	0.486	0.309	0.270
2004	0.308	0.480	0.303	0.269
2005	0.308	0.514	0.304	0.264
2006	0.303	0.509	0.305	0.258
2007	0.307	0.510	0.307	0.266
2008	0.307	0.515	0.308	0.265
2009	0.311	0.517	0.311	0.268
2010	0.300	0.512	0.301	0.257
2011	0.296	0.504	0.294	0.253
2012	0.288	0.494	0.285	0.247

Source: Own computations from data source A.

FIGURE 3

The Gini coefficient for gross income of employees, 1991-2012



Source: Own computations from data sources A and B.

TABLE 9

The Gini coefficient for gross income and concentration coefficients for paid PIT, employee social contributions and net income, data source B

Year	Gini coefficient for gross income	Concentration coefficient for paid PIT	Concentration coefficient for employee social contributions	Concentration coefficient for net income
1991	0.290	0.360	0.285	0.276
1992	0.313	0.395	0.309	0.296
1993	0.326	0.411	0.323	0.307
1994	0.330	0.523	0.330	0.291
1995	0.333	0.525	0.331	0.294
1996	0.339	0.535	0.335	0.298
1997	0.340	0.540	0.335	0.299
1998	0.341	0.541	0.338	0.299
1999	0.351	0.573	0.348	0.305
2000	0.352	0.576	0.350	0.306
2001	0.345	0.547	0.346	0.302
2002	0.348	0.553	0.349	0.304
2003	0.346	0.549	0.346	0.302
2004	0.347	0.552	0.346	0.303
2005	0.345	0.586	0.344	0.297
2006	0.337	0.576	0.342	0.289
2007	0.333	0.572	0.336	0.287
2008	0.334	0.596	0.336	0.284
2009	0.336	0.599	0.339	0.285
2010	0.331	0.614	0.332	0.278
2011	0.322	0.597	0.322	0.271
2012	0.321	0.600	0.317	0.272

Source: Own computations from data source B.

What is the role of PIT and its effect on after-tax income? As seen from tables 8 and 9, the concentration coefficients for net income did not change much in the 1990s, as the increasing inequality in the distribution of gross incomes was – to a very large degree – neutralized by the PIT. Thus, the new PIT legislation applied in 1994 significantly increased the PIT progressivity. Again, the increase in the concentration coefficient for withheld PIT (data source A) in 1994 is much less pronounced than the corresponding increase for paid PIT (data source B).

The new 1994 PIT legislation obviously took everybody by surprise, so that the inequality in the distribution of net incomes of employees – as measured by the concentration coefficient for net incomes – actually decreased in that year; the concentration coefficient for "net" income (data source A) decreased from 0.259 in 1993 to 0.248 in 1994, whereas the corresponding decrease for the concentra-

tion coefficient for net income (data source B) was from 0.307 to 0.291. A large increase in the concentration coefficient for paid PIT (series B) is registered in 1999, caused by the aforementioned 2000 *Law on extraordinary decrease of tax liability*. This law reduced the tax liability of low-income groups for 2000 and (retroactively) for 1999. As the law expired in 2001, the concentration coefficient for paid PIT in 2001 returned to its pre-1999 value. Moreover, since it did not require any adjustments in the withholding tax formula, there were virtually no changes in the concentration coefficient for withheld PIT (series A) in those two years, as seen from table 8.

The increase in the concentration coefficient for both withheld PIT and paid PIT in 2005 was the result of a large increase in the personal allowance, introduced by the new PIT legislation (ZDoh-1). Though further new PIT legislation (ZDoh-2), introduced in 2007, did not have an impact on the concentration coefficient for withheld and paid PIT[13], amendments introduced in 2008 (differentiated personal allowance) and 2010 (large increase in the personal allowance for the low-income group) noticeably increased the concentration coefficient for paid PIT (data set B), whereas the effect on the concentration coefficient for withheld PIT (data set A) is negligible. Why? In our view, the cause for this discrepancy is that legislative changes introduced in 2008 and 2010 were – to a large degree – not taken into account in setting the amount of withheld PIT. However, unlike the 2000 *Law on extraordinary decrease of tax liability*, where a blanket rule applied that the legislative change was not taken into account in setting the amount of individual withheld PIT, here taxable persons could opt-out and declare that they did not wish the favourable personal allowance to apply[14].

6 THE DYNAMICS OF TAX PROGRESSIVITY

The personal income tax is a progressive tax, meaning that high-income persons pay relatively more tax than low-income persons. Formally, progressivity means that the average tax rate is an increasing function of income, i.e. that the expression:

$$\frac{d}{dY}\left(\frac{T}{Y}\right) \tag{1}$$

is positive. A negative value would imply that the tax is regressive and a value of zero would imply that the tax is proportional. Here T denotes tax liability, which is a function of income Y. This measure was mentioned by Pigou (1928) and analytically used on U.S. income tax data by Musgrave and Thin (1948). The discrete

[13] The explanation for this "surprising" result is given in section 6.

[14] Annual PIT reports of the TARS, as well as an analysis based on data set B, show large increases in the difference between final PIT liability and withheld tax in 2008 and 2010. This gap was due mostly to large increases of tax refunds disbursed by the TARS to taxpayers. It was particularly pronounced for the low-income groups. Obviously, low-income taxpayers – for various reasons – opted for a less favourable personal allowance used in computing the amount of withholding PIT. Thus, for the bottom quintile group of taxpayers, tax refunds (as percentage of withheld PIT) were: 30.4% in 2006, 27.6% in 2007, 59.5% in 2008, 63.4% in 2009, 80.2% in 2010, 76.7% in 2011, and 77.3% in 2012.

variant of the above definitional formula can be used not only for the analysis of a single income tax schedule, but also to analyse changes in the personal income tax schedules. Thus, the discrete variant of this measure uses two points on the same curve (to analyse progressivity of a given personal income tax schedule) or two points on two different curves (to analyse changes in tax progressivity when changes in the personal income tax have occurred). This measure, as well as other measures derived from this "definitional" measure of tax progressivity, is not an aggregate measure, though Musgrave and Thin (*op. cit.*) did propose one such aggregate measure[15].

Most aggregate measures of tax progressivity rely on Lorenz-type curves. One such measure is the Reynolds and Smolensky (1977) index, defined as:

$$RS = G_x - C_N^x, \tag{2}$$

where G_x is the Gini coefficient for gross (i.e. pre-tax) income and C_N^x is the concentration coefficient for net (after-tax) income. The other measure was suggested by Kakwani (1977) and has the following form:

$$K = C_t^x - G_x, \tag{3}$$

where C_t^x is the concentration coefficient for taxes. The Kakwani index of progressivity has some desirable features (*cf.* Kakwani, 1977; Creedy, 1999). Namely, the Reynolds-Smolensky index measures the vertical equity effect of the tax system, and this effect depends not only on the concentration of tax payments, but also on the average tax rate. The Kakwani index however does not depend on the "size" of the tax system, but measures only the extent of tax progressivity. It can easily be shown[16] that:

$$RS = \frac{t}{1-t} K, \tag{4}$$

where t is equal to the average tax rate. Denoting by G_N the Gini coefficient for net (i.e. after-tax) income and by R the Atkinson-Plotnick reranking effect, equal to $G_N - C_N^x$, the following relation holds:

$$G_x - G_N = RS - R. \tag{5}$$

This relation presents the decomposition of the redistributive effect of the tax into a component due to tax progressivity and component due to reranking. Čok and Urban (2007) analysed such a decomposition based on Slovene and Croatian PIT data[17]. Our analysis will however be confined to the Kakwani index, with a further

[15] See Musgrave and Thin (1948, p. 510). It is equal to $(1 - G_N) / (1 - G_x)$, where G_N and G_x are Gini coefficients for gross (pre-tax) and net (after-tax) income, respectively.
[16] This can be directly derived from Rao's identity.
[17] They have actually further decomposed the term R from expression.

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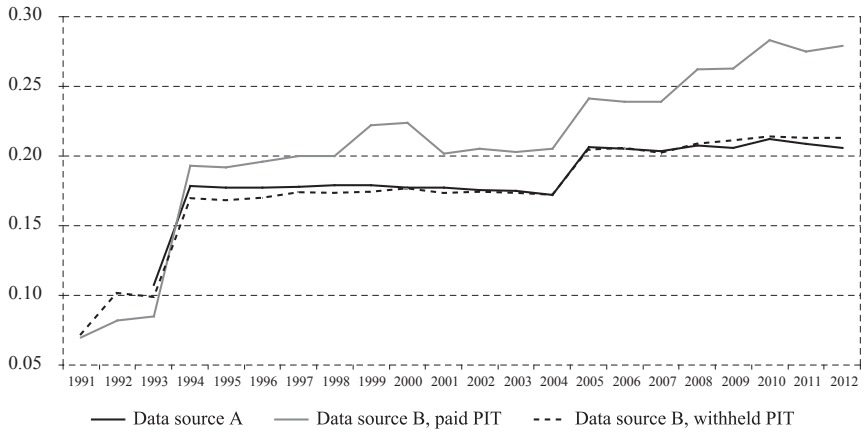
restriction that this index will be computed by considering only personal income taxes. This will be done in order to highlight the dynamics of PIT progressivity[18].

The Kakwani index of progressivity, depicted in figure 4, is computed using three different data sets. The value of the index based on data from data source A is computed using the withheld PIT, whereas the value of the index based on data source B will be computed using (a) withheld PIT, and (b) final PIT liability.

Computation with option (a) will provide yet another opportunity to compare the values obtained from data sources A and B. As seen from figure 4, the values of the Kakwani index for withheld PIT based on data sources A and B are quite comparable. Of course, the Kakwani index computed using paid PIT is consistently higher than the index computed using withheld PIT, as the data of the Tax Administration of the Republic of Slovenia show that tax refunds are strongly concentrated among low-income groups, and additional tax payments are, likewise, strongly concentrated in higher income groups.

Figure 4

Kakwani index of progressivity, 1991-2012



Note: Kakwani index of progressivity based on data source A is computed using only the concentration coefficient for withheld PIT. For data source B the index is computed using: (a) withheld PIT, and (b) paid PIT.

Source: Own computations from data sources A and B.

The Kakwani index increased by leaps and bounds; these leaps and bounds occurred in the years of introduction of new PIT legislation. Thus, the first big leap occurred in 1994, when the new PIT legislation (ZDoh) replaced the 1991 Personal Income Tax Act. The second leap in this index occurred in 1999, when the

[18] Such a "partial" computation of the Kakwani index, without taking into account employee social security contributions, prevents the use of any decomposition measures. Also, the relation between the Reynolds-Smolensky index and the Kakwani index obviously do not hold for such a "partially" computed Kakwani index.

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Law on extraordinary decrease of tax liability decreased the PIT tax liability for low-income groups. Upon expiration of this law, the Kakwani index fell "back into line". A further increase in this index occurred in 2005, when the new PIT Act (ZDoh-1) came into force.

It is quite interesting to observe that the PIT legislation which came into force in 2007 (ZDoh-2) did not have an impact on the Kakwani index, although the marginal tax rate was lowered from 50 per cent to 41 per cent. A more detailed comparison of the PIT burden according to the PIT parameters, valid in 2006, and new parameters applied in 2007 (ZDoh-2) shows that inframarginal rates were reduced, but marginal rates for the upper end of the income distribution were increased. The net summary effect of these changes on the Kakwani index was negligible. Finally, the introduction of a differentiated personal allowance in 2008 and a large increase in the personal allowance for the low-income group in 2010 resulted in leaps in tax progressivity in these two years.

7 CONCLUDING REMARKS

Our analysis, based on incomes of employees, as reported in the personal income tax returns, has shown that income inequality increased in the very first years of transition, i.e. the early 1990s. Starting from 1994, when the institutional setting – the Economic and Social Council, collective agreements and legislation on minimum wages – were firmly established, the increases in inequality were quite modest. And not only that; the increases in the inequality of net incomes were virtually negligible, due to the strong mitigating effect of personal income tax legislation. In other words, the tax system acted as an effective brake, preventing the increases in inequality of gross incomes to be transmitted to increases in inequality of net incomes.

The low and stable income inequality in Slovenia is quite remarkable, considering the large social, economic and institutional changes, with the more recent years characterized by a large drop in GDP and a discredited political and economic elite. Could this stability be due also to a large – and strongly wage-regulated - public sector, which could act as a "wage-setter" also for the private sector? This is certainly one of the research questions which would be worth exploring in the future.

REFERENCES

1. Alvaredo, F. [et al.], 2013. The Top 1 Percent in International and Historical Perspective. *The Journal of Economic Perspectives,* 27(3), pp. 3-22. doi: 10.1257/jep.27.3.3
2. Atkinson, A., 1998. The Distribution of Income in Industrialized Countries. In: *Income Inequality: Issues and Policy Options, a Symposium Sponsored by the Federal Reserve Bank of Kansas City.* Kansas City, MO: The Federal Reserve Bank of Kansas City, pp. 11-32.
3. Atkinson, A., 2007. The Long Run Earnings Distribution in Five Countries: "Remarkable Stability", U, V or W? *Review of Income and Wealth*, 53(1), pp. 1-24. doi: 10.1111/j.1475-4991.2007.00215.x
4. Atkinson, A., 2008. *The Changing Distribution of Earnings in OECD Countries*. Oxford: Oxford University Press. doi: 10.1093/acprof:oso/9780199532438.001.0001
5. Atkinson, A., Piketty, T. and Saez, E., 2011. Top Incomes in the Long Run of History. *Journal of Economic Literature*, 49(1), pp. 3-71. doi: 10.1257/jel.49.1.3
6. Blinder, A. S., 1993. Comment. In: D. B. Papadimitriou and E. N. Wolff, eds. *Poverty and Prosperity in the USA in the Late Twentieth Century.* Basingstoke: Macmillan.
7. Čok, M. and Urban, I., 2007. Distribution of Income and Taxes in Slovenia and Croatia. *Post-Communist Economies*, 19(3), pp. 299-316. doi: 10.1080/14631370701503406
8. Čok, M., Urban, I. and Verbič, M., 2013. Income Redistribution Through Taxes and Social Benefits: The Case of Slovenia and Croatia. *Panoeconomicus*, 60(5), pp. 667-686. doi: 10.2298/PAN1305667C
9. Creedy, J., 1999. Taxation, Redistribution and Progressivity: An Introduction. *Australian Economic Review,* 32(4), pp. 410-422. doi: 10.1111/1467-8462.00130
10. Kakwani, N. C., 1977. Measurement of Tax Progressivity: An International Comparison. *The Economic Journal*, 87(345), pp. 71-80. doi: 10.2307/2231833
11. Majcen, B. [et al.], 2009. The Income Tax Reform in Slovenia: Should the Flat Tax Have Prevailed? *Eastern European Economics*, 47(5), pp. 5-24. doi: 10.2753/EEE0012-8775470501
12. Musgrave, R. A. and Thin, T., 1948. Income Tax Progression, 1929-48. *Journal of Political Economy*, 56(6), pp. 498-514. doi: 10.1086/256742
13. Pigou, A. C., 1928. *A Study in Public Finance.* London: Macmillan.
14. Piketty, T. and Saez, E., 2013. Top Incomes and the Great Recession: Recent Evolutions and Policy Implications. *IMF Economic Review,* 61(3), pp. 456-478. doi: 10.1057/imfer.2013.14
15. Piketty, T., 2013. *Capital in the Twenty-First Century.* Harvard University Press.

16. Reynolds, M. and Smolensky, E., 1977. *Public Expenditures, Taxes, and the Distribution of Income: The United States 1950, 1961, 1970*. New York: Academic Press.
17. Stanovnik, T. and Verbič, M., 2005. Wage and Income Inequality in Slovenia, 1993-2002. *Post-Communist Economies*, 17(3), pp. 381-397. doi: 10.1080/14631370500204412
18. Stanovnik, T. and Verbič, M., 2012. The Distribution of Wages and Employee Incomes in Slovenia, 1991-2009. *Working Paper,* No. 60. Ljubljana: Institute for Economic Research.
19. Stanovnik, T. and Verbič, M., 2013. Earnings Inequality and Tax Progressivity in Slovenia, 1991-2009. *Acta Oeconomica*, 63(4), pp. 405-421. doi: 10.1556/AOecon.63.2013.4.1
20. Štoka-Debevec, M., 1997. Plačna politika od leta 1990 dalje ter razlogi zanjo. *Slovenska ekonomska revija*, 48(1-2), pp. 166-184.