

INCOME INEQUALITY AND TAX PROGRESSIVITY IN SLOVENIA: SOME RECENT RESULTS

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Tine Stanovnik
Nataša Kump

Tine Stanovnik¹, Nataša Kump²

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1. Kump, Nataša

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¹ University of Ljubljana, School of Economics and Business, Slovenia; stanovnik@ier.si

² Institute for Economic Research, Ljubljana, Slovenia; kumpn@ier.si



Abstract

This paper gives an update analysis of income inequality and tax progressivity in Slovenia. It is based on large samples of the Personal income tax (PIT) database, provided by the Financial Administration of the Republic of Slovenia. The incomes of wage earners for the years 2003, 2004, 2005 and 2016 were analysed. It has been shown that the concentration of capital income at the very top of the income distribution, i.e. the top 1%, has increased quite considerably in 2016, as compared to 2005. The overall effect on aggregate measures of income inequality is rather small, due to the (still) modest share of capital income in the income of wage-earners.

The tax progressivity of PIT, measured by the Kakwani index, increased sharply in 2005 (as compared to 2004) and somewhat less in 2016 (as compared to 2005). This can be explained by new PIT legislation in 2005, and further changes in 2008 and 2010. The thrust of these changes was a lessening of the tax burden for low-income taxpayers. Not surprisingly, the overall progressivity, taking into account not only PIT, but also employee social contributions, has not changed much in this time period, with the Kakwani index being only slightly higher in 2016 as compared to 2003. We attribute this »stability« to the fact that capital incomes are not subject to social contributions.



1. Introduction

Income inequality is a subject of continuing interest, not only for the research community, but also for the wider public. There is therefore a clear need to monitor the dynamics of income inequality and to attempt to analyse the causes for such dynamics. We also hold the view that Slovenia offers valuable lessons to other Central and East European countries. We have documented elsewhere,³ how institutional changes (The introduction of a tripartite body, the Economic and Social Council) in 1994, as well as legislative changes (the introduction of minimum wage legislation) in 1995 put a sharp brake on the very large increases in income inequality in the first years of transition. Since then, the gradual creeping up of income inequality, using gross income as our measure, has been mostly successfully »neutralized« by the increased tax progressivity of the personal income tax system.

Similar to our previous research, this research is also based on the PIT datasets, generously provided to the Institute for Economic Research by the Financial Administration of the Republic of Slovenia (FARS). However, we are not just updating the results, but are also giving a somewhat different emphasis. More space is devoted to the analysis of capital income, and a more detailed discussion on tax progressivity is provided.

The structure of our paper is as follows. Section 2 will provide a brief discussion of the statistical sources relevant for the analysis of income inequality. We will explain why extending the data series to the socialist period (i.e. pre 1991) is not feasible. Section 3 will briefly explain the datasets which will be used in our analysis. These are large (depersonalized!) random samples derived from the FARS personal income tax database. Section 4 (»Some observations on the dataset and the treatment of capital income«) explains the changes in the tax treatment of capital income sources, as well as some definitional changes. Section 5 (»The composition and distribution of gross income«) provides the composition of income by income quintiles, as well as the distribution of income across income quintiles. Here income is divided into four constituent parts: labour income, capital income, mixed income and other income (subject to tax). This section also briefly discusses the distribution of withheld PIT, paid PIT and employee social contributions, across income quintiles. Section 6 provides the standard aggregate measure of income inequality – the Gini coefficient, and the concentration coefficients of the constituent parts of gross income (PIT, employee social contributions and net income). The Kakwani index, which is a widely used measure of tax progressivity, is presented. Here, we measure not only the progressivity of the personal income tax system, but also the progressivity of the joint PIT system and social contribution system. Not surprisingly, the inclusion of employee social contributions in the analysis of tax progressivity significantly »dampens« the overall progressivity. Section 7 provides some concluding remarks.

³ See Stanovnik & Verbič (2013).



2. Analysis of income inequality in Slovenia: methodological and statistical issues

In recent years research interest has been – to a large degree - concentrated on the analysis of the dynamics of income and wealth, based on long, »historic«, time series, extending well into the past. Also, much attention has been given to the analysis of the incomes at the top of the income distribution, i.e. the top 1%. Much credit for this shift of emphasis is due to the (late) Anthony Atkinson and to Thomas Piketty. Piketty's book *Capital in the twenty-first century* was probably one of the most influential books in economics in recent times.

Creating long-time series of income (or wealth) data is beset with many problems. Even in stable countries, with an enviable record of collecting statistical data on incomes and wealth, creating such series requires a number of »heroic« assumptions. For countries that have experienced large geopolitical shifts, and that lack stable statistical records, such an endeavor is simply not possible.

Slovenia presents a fine »case-study« of problems one encounters when attempting to create time series of income (or wealth) data extending well into the past. We now turn to a brief presentation and discussion of the statistical sources which could be used for the analysis of income inequality in Slovenia.

2.1 Household budget surveys

Household budget surveys provide essential statistical data for the analysis of household consumption, expenditures and income. The first large Household Budget Survey (HBS) was performed in 1963, by the Statistical Office of Slovenia and under the guidance of the Federal Statistical Office of Yugoslavia. These surveys were carried out in five-year intervals and were based on large samples of households. Smaller surveys were carried out annually. Following the independence of Slovenia in 1991, the methodology of these surveys changed considerably, along the guidelines set by the Eurostat. From 1997 up to 2011, annual surveys using small samples were carried out. The published data were based on a stitched sample of three consecutive years. These data were calculated to the middle year which was used as the reference year. In 2012, the methodology has been changed and moved to larger samples; these surveys are carried out every three years.

In 2005 a completely new survey was introduced – SILC (Survey on income and living conditions). This pan-European panel study was designed specifically for the analysis of income dynamics, and is performed in all EU Member states.

Though various analyses based on the HBS, comparing the pre-independence and post-independence period have been performed, some caveats are required in directly comparing economic well-being of households, i.e. their »command over resources«. We provide just one example.

In the socialist period (1945 – 1991) the tenants in social housing (i.e. housing owned by the state, municipal governments and enterprises) were predominantly the better-off. We use the term »predominantly«, as in a number of large and financially strong enterprises all workers were offered such housing. However, as a rule, the political, managerial and technical elite had a privileged access to such housing; the less well-off had the option of building their own houses (admittedly, with fairly »cheap« loans, i.e. with negative real interest rates, due to high inflation and no revalorisation of



loans). The rents in social housing were low. Following independence in 1991, this stock was offered for sale to sitting tenants, under very advantageous conditions. An analysis of the sale of the social housing stock in 1991 (Stanovnik, 1995) has shown the »perverse« distribution of housing ownership, with tenant (social) housing being more concentrated in higher income groups, and owner-occupied housing more in low income groups.

Similarly, other privileges enjoyed by the elites – privileged access to medical care, vacation resorts etc. mask the true extent of a household's »command over resources«. Though in the case of Yugoslavia these privileges pale in comparison to those enjoyed by the elites in the Soviet Union and the Soviet bloc, they did exist and they were not negligible. Thus, a comparison of well-being of households in the socialist and post-socialist period is beset with serious problems, due to the non-market provision of some goods and privileged access to some goods and services.

2.2 Other household and personal income data collected by the statistical office

Households represent the basic statistical unit for the analysis of consumption and income. However, for the purpose of analysing the dynamics of income and income inequality, analysing wages – which represent the most important income source for households – is quite valuable. To quote Alan 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 the rise in wage inequality«.

Data on the distribution of (monthly) wages were first being regularly published by the Statistical office of Slovenia in 1968. These data were collected – and published - semi-annually, with the monthly distribution of wages for March and September presented. The distribution was given in some twenty wage intervals. Since 2005, these data are being collected only for the month of September.

Can we compare data on wages in the pre-independence and post-independence period? In the pre-independence (»socialist«) period, wages were based on the net concept. The personal income tax was nonexistent,⁴ and a fairly complex system of social contributions was applied. The concept of gross wage was introduced in 1991, and with it the personal income tax.

The scope of wage earners included in the analysis of the afore-mentioned publications of the Statistical office also underwent changes. Workers in all organisations and enterprises were included, with some exceptions and limitations:

- a) Only workers working full-time are included.
- b) Workers working in private enterprises with at least 3 employees were included since 1992. Workers working in private enterprises (with one or two employees) were included since 2005.
- c) Workers employed by self-employed persons were being included starting in 2004 (these workers represent some 5% of the workforce).

Also worth mentioning is that only wages are reported, without other wage-related benefits (such as vacation allowance).

⁴ This does not mean that no income source was taxed. Income of the self-employed was taxed, as well as income from royalties and property rights.



2.3 Data collected by the Financial administration

The Personal income tax (PIT) was introduced in Slovenia in 1991, and annual income tax returns are stored at the Financial administration of the Republic of Slovenia. These data provide an invaluable source for the analysis of income inequality, gender wage disparities, age-wage profiles etc. However, these databases contain only PIT data. The Statistical office, using these PIT data and the Registry of the labour active population (*Statistični register delovno aktivnega prebivalstva* – SRDAP) merges the two databases to form a new data base containing only persons employed full-time with the same employer during the whole year. The sector of employment of the worker (according to the Standard Classification of Activities) is also included. The Statistical office occasionally (on request) produces tabulations, using this database. There is differentiation according to the sector of employment (public, private) and sex (male, female); data are presented in tabular form, with 14 income groups (intervals). The tables include itemized sources of income subject to tax, as well as withheld PIT and employee social contributions.⁵

The tabulations provided by the Statistical Office of the Republic of Slovenia, as well as the »raw« data (individual personal income tax returns) include only incomes which are subject to tax and are included in the Personal income tax form. Thus, most social benefits are not included, and only a small number of high pensions are actually subject to tax. Furthermore, the tax treatment of capital income was quite uneven throughout the years, as we shall see in section 4.

⁵ The analysis of these tabulations is presented in Stanovnik & Verbič (2005) and Stanovnik & Verbič (2013).



3. The data source used in our analysis

Our data source are large random samples provided by the Financial administration of the Republic of Slovenia (FARS). These samples are extracted from the PIT files. From 1991 to 2004, these were 5% samples, meaning that some 60,000 persons liable for PIT were included. From 2005 onward, the size of the samples increased to 10%. From 2015 onward, the sample includes all persons who received any kind of taxable income. Prior to 2015, only persons obliged to fill in the tax return were included in the FARS database. The samples were suitably depersonalized by the FARS. Thus, with regard to non-income data, only year of birth and sex of the taxpayer were provided.

Our analysis will cover the years 2003, 2004, 2005 and 2016. There is a reason for this. In 2003, 2004 and 2005 almost all capital income sources were included in the comprehensive income tax, i.e. they were included and itemized in the PIT tax form.⁶ The year 2005 represents the last year of the comprehensive income tax; from 2006 onwards, most forms of capital income were subject to schedular taxation and were not included in the PIT tax form.⁷ The problem of comparability of samples was resolved by FARS, though only for the year 2016. For that year, relevant capital income data, available in other files, were added to (»stitched to«) the basic PIT file, which contains only data from the PIT tax form. Thus, for persons included in the 2016 sample, all income subject to tax was included.⁸

4. Some observations on the dataset and the treatment of capital income

Our samples contain a very heterogeneous set of taxable persons, with different rules regarding their tax treatment. All employees are required to fill in their tax returns – provided their annual income is greater than the personal allowance⁹. Pensioners are the second largest group of income recipients, and their tax treatment differs considerably from the treatment of employees. In a nut-shell: only high-income pensioners are actually subject to PIT, and are thus in years 2003 – 2005 included in the PIT file.¹⁰ Similarly, the group of self-employed persons – itself consisting of several subgroups – was (and still is) subject to very generous treatment of costs incurred in their business activity.

Therefore, our analyses of income and income inequality in Slovenia were »traditionally« confined to the group of wage earners, i.e. persons who have recorded a positive amount of wages or wage compensations in their PIT tax returns.¹¹

With the addition of capital income sources in the 2016 dataset, comparability with the datasets for the years 2003, 2004 and 2005 seems to be assured, in that all labour and capital income subject to tax

⁶ In section 4 we will explain which capital income sources were excluded.

⁷ The PIT tax form for 2006 included only two capital income sources: (a) rent from immovable property and (b) royalties. Since 2013 rent from immovable property has also been subject to schedular taxation, and the only capital income item retained in the PIT tax form is income from royalties.

⁸ Of course, this adding of capital income sources to the basic PIT database could also be performed for all the years, from 2006 onward. This remains a possibility for the future.

⁹ Actually, from 2007 onward, the taxpayer receives a filled-out tax form from the FARS, which he is only required to verify.

¹⁰ For pensions, the "socialist" net concept has been retained in Slovenia. The PIT treatment of pensions is as follows: pensioners receiving pensions are subject to a (general) personal allowance and a tax credit, amounting to 13.5% of their pension. Thus, only a quarter of pensioners actually paid PIT in 2016.

¹¹ This selection rule was first applied in Stanovnik & Verbič (2005).



is now included. However, one must bear in mind that the scope of inclusion and tax reliefs for some capital income sources has changed through the years.

Thus, prior to 2005, only interest payments on loans were subject to tax; interest payments on bank deposits were exempted. Taxation of these interest payments started in 2005, with the introduction of the new PIT law (ZDoh-1). However, the tax treatment was quite favourable, with a generous tax allowance and only partial inclusion of interest payments into the tax base.¹² With the introduction of the new PIT law (ZDoh-2) in 2007, only the generous tax allowance was retained.¹³

In 2005, with the introduction of ZDoh-1, the very broad definition of property rights was abolished; and a less favourable tax treatment for this income source was introduced.¹⁴ Henceforth, most of this income source was defined as labour income.¹⁵

Income from mutual funds was a short-lived »novelty«, introduced in the 2005 PIT law (ZDoh-1); following the introduction of a new PIT law (ZDoh-2) in 2006, this income source has been treated either as interest payments or dividends.

One must bear in mind these changes when analysing the composition of capital income, presented in Table 1. Here, capital incomes of all physical persons liable for PIT are included. We provide the composition of capital incomes based on Ministry of finance data (column A) and the sample data (column B).

Table 1: The composition of capital incomes, all physical persons (subject to PIT)

	2003		2004		2005		2016	
	A	B	A	B	A	B	A	B
Rent of immovable property	26.4	27.3	25.0	26.9	26.7	26.9	29.8	24.9
Property rights	49.8	49.0	54.0	49.3	4.5	4.5	1.6	0.9
Interest payments	0.3	0.3	0.4	0.4	36.0	33.9	11.1	12.4
Dividends	20.6	21.1	23.2	19.3	25.0	26.0	40.2	44.6
Income from mutual funds	-	-	-	-	2.6	2.4	-	-
Capital gains	2.8	2.3	3.6	4.0	5.2	6.4	17.3	17.1
Total	100	100	100	100	100	100	100	100

Column A: The Ministry of finance data.

Column B: Data based on PIT samples.

As seen from Table 1, the correspondence between the MF data and the sample data is satisfactory. The large drop in the share of income from royalties in 2005 was – as noted above – due to the definitional change and less favourable tax treatment, relegating most of this »capital« income to labour income. Similarly, the large increase in the share of interest payments in 2005 is due to the inclusion of interests on bank savings deposits into the »tax net«.

¹² Article 141, ZDoh-1.

¹³ The deduction amounted to 1000 EUR.

¹⁴ In the previous 1993 PIT law, the tax deduction for this income was 40% of the income, from 2005 onward it was only 10%.

¹⁵ This income was henceforth declared either as income from employment (item 1109) or income from occasional contractual work (item 1230)



5. The composition and distribution of gross income

Table 2 shows the composition of gross income of wage-earners, by income quintiles.

Table 2: The composition of gross income (by income quintiles)

	Lowest 20%	Quintiles 2 to 4	Highest 20%	Highest 5%	Highest 1%	All
2003						
Labour income	99.03	98.85	94.89	92.41	89.84	97.18
Capital income	0.30	0.72	4.31	6.63	9.08	2.22
Mixed income	0.67	0.43	0.79	0.96	1.08	0.60
All	100	100	100	100	100	100
2004						
Labour income	98.97	98.74	94.34	91.39	88.26	96.87
Capital income	0.37	0.77	5.07	8.03	11.27	2.58
Mixed income	0.66	0.49	0.59	0.59	0.47	0.55
All	100	100	100	100	100	100
2005						
Labour income	98.66	98.21	94.91	92.30	88.65	96.84
Capital income	0.51	1.03	3.99	6.35	9.99	2.25
Mixed income	0.75	0.68	0.92	1.10	0.88	0.79
Other income (subject to tax)	0.08	0.09	0.18	0.25	0.48	0.13
All	100	100	100	100	100	100
2016						
Labour income	98.31	98.28	91.04	83.85	71.25	95.22
Capital income	0.34	0.56	6.52	13.12	27.20	3.07
Mixed income	1.21	0.79	0.95	0.93	0.51	0.88
Other income (subject to tax)	0.14	0.37	1.49	2.10	1.04	0.83
All	100	100	100	100	100	100

Source: PIT samples, FARS. Note: only wage-earners included.

Labour income: wages, wage related compensations and bonuses, pensions.

Capital income: dividends, interest, rent, capital gains (see table 1).

Mixed income: self-employment income, cadastral income.

Other income (subject to tax): gifts, awards (not work related), some scholarships, alimonies.

One notes that the structure of gross income of wage earners in 2003, 2004 and 2005 was fairly stable. The share of capital income in gross income steadily increased, going from low to high income groups. Even in the top 1% this share was still a modest 10-11% of gross income of this income group. In 2016, the share of capital income (in gross income) in the first four income quintiles was quite small; however, for the highest quintile it amounted to 6.52%, and for the top 1% it amounted to a full 27.2% of their gross income. The share of capital income in total gross income of wage earners is steadily increasing through the years. Bearing in mind that in 2003 and 2004 income from property rights represented some 50% of total capital income, and that since 2005 most of this income has been redefined as labour income (which it should have been at the very start of PIT legislation), the share of capital income in total gross income of wage earners increased from some 1.1 % in 2003 to some 3.1% in 2016.

Table 3 shows the distribution of labour income, capital income, mixed income and other income (subject to tax). The very large increase in the concentration of capital income in 2016 is not surprising, considering the composition of income given in Table 2. Whereas in 2003, 2004 and 2005 capital



income accruing to the top 1% wage earners was in the range of 25 to 30% of the capital income received by all wage earners, in 2016 the top 1% of wage earners received some 64% of the capital income received by all wage earners!

Table 3: The distribution of labour income, capital income, mixed income and other income (subject to tax), across income quintiles

	Lowest 20%	Quintiles 2 to 4	Highest 20%	Highest 5%	Highest 1%
2003					
Labour income	7.66	50.85	41.49	17.11	5.82
Capital income	1.01	16.29	82.69	53.82	25.80
Mixed income	8.34	35.78	55.89	28.71	11.27
2004					
Labour income	7.75	50.61	41.64	17.30	5.95
Capital income	1.09	14.90	84.00	57.01	28.52
Mixed income	9.12	44.59	46.29	19.67	5.66
2005					
Labour income	7.77	50.49	41.73	17.28	5.87
Capital income	1.73	22.73	75.54	51.19	28.47
Mixed income	7.26	42.93	49.81	25.22	7.15
Other income (subject to tax)	5.03	35.01	59.96	36.87	24.70
2016					
Labour income	7.38	52.16	40.47	16.01	5.38
Capital income	0.79	9.30	89.91	77.78	63.73
Mixed income	9.78	44.91	45.31	19.15	4.14
Other income (subject to tax)	1.19	22.76	76.05	46.08	9.03

Source: PIT samples, FARS.

Note: only wage-earners included. Also, see table 2.

The shares of labour income in the bottom and top income quintile has decreased somewhat in 2016, as compared to 2005. With regard to the lowest 20% of wage earners, it remains to be seen whether the significant changes in the minimum wage legislation introduced in 2010 will have a discernible effect on their labour income share.

Table 4 shows the distribution of gross income, withheld PIT, paid PIT and employee social contributions across income quintiles. As a rule, lower income groups receive PIT refunds and higher income groups pay additional amounts of PIT, on top of their withheld PIT. The difference between withheld PIT and paid PIT is particularly large for the first quintile. Thus, in 2016, for this income group the share of withheld PIT (in total withheld PIT) was 2.91 %, whereas the share of paid PIT was only 0.69 %.¹⁶ The differences in the shares of employee social contributions and gross income reflect the extent of non-wage incomes in a given income quintile. Thus, in 2016, the top 1% of wage earners received 7.19 % of total gross income, but paid only 5.32 % of all (employee) social contributions. This is due to the fact that this income group receives a large amount of capital income (which is not subject to social contribution payments), as well as some sources of labour income which are not subject to payment of social contributions.

¹⁶ The causes for this large difference in the bottom income quintile group are that many of these taxpayers opt-out of the favourable differentiated general tax allowance and prefer a sizeable tax refund. For more on this, see Stanovnik & Verbič (2014: 458).



Table 4: The distribution of withheld PIT, paid PIT, employee social contributions and gross income, across income quintiles

	Lowest 20%	Quintiles 2 to 4	Highest 20%	Highest 5%	Highest 1%	All
2003						
Withheld PIT	4.37	38.08	57.56	29.16	11.81	100
Paid PIT	3.49	36.66	59.85	31.10	12.99	100
Empl.soc. contributions	7.39	50.39	42.22	17.38	5.77	100
Gross income	7.52	49.99	42.49	17.99	6.29	100
2004						
Withheld PIT	4.43	37.92	57.65	29.47	12.05	100
Paid PIT	3.48	36.37	60.15	31.68	13.41	100
Empl.soc. contributions	7.46	50.15	42.39	17.55	5.95	100
Gross income	7.58	49.66	42.76	18.34	6.53	100
2005						
Withheld PIT	3.63	36.54	59.83	30.60	12.32	100
Paid PIT	2.74	34.42	62.84	33.19	13.98	100
Empl.soc. contributions	7.40	50.37	42.15	17.16	5.66	100
Gross income	7.63	49.79	42.58	18.13	6.41	100
2016						
Withheld PIT	2.91	39.43	57.66	30.68	13.67	100
Paid PIT	0.69	37.15	62.16	34.08	15.46	100
Empl.social contributions	7.14	51.85	41.01	16.17	5.32	100
Gross income	7.14	50.53	42.32	18.19	7.19	100

Source: PIT samples, FARS.

Note: only wage-earners included.

Looking at the quintile income shares, the changes seem to be rather small. Thus, the income share of the bottom quintile is »hovering« around 7.5% (with a low of 7.1 % in 2016), the share of quintiles 2 to 4 is »hovering« around 50 % (with a high of 50.53 % in 2016) and the top income quintile share »hovering« around 42 to 43 %. However, the noteworthy decrease in the income share for the bottom income quintile (from 7.63 % in 2005 to 7.14 % in 2016) and the increase in the share for the top 1 % - from 6.41 % to 7.19 % in 2016 would merit a closer scrutiny.

6. Income inequality and tax progressivity

Table 5 provides some further elements for the analysis of income inequality and tax progressivity. The Gini coefficient for gross income – as an aggregate measure – has been fairly stable in this time period. Considering the known fact that this measure of inequality is most sensitive to changes in the middle of the income distribution, the changes at the bottom (first quintile) and the very top (top 1 %) of the income distribution, as observed for 2016, resulted in a rather small increase in the Gini coefficient, from 0.345 in 2005 to 0.349 in 2016. Changes in the concentration coefficient for paid PIT offer a straightforward explanation. The large increase in this coefficient in 2005 was doubtlessly caused by the introduction of the new PIT law (ZDoh-1), which significantly increased the personal allowance. Further legislative changes in 2008 (introduction of a differentiated personal allowance) and 2010 (large increase in the personal allowance for low-income taxpayers) caused a further increase in the concentration coefficient for paid PIT.



Table 5: The Gini coefficient for gross income and concentration coefficients for paid PIT, employee social contributions and net income

	Gini coefficient for gross income	Concentration coefficient for paid PIT	Concentration coefficient for employee social contributions	Concentration coefficient for net income
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	0.298
2016	0.349	0.604	0.337	0.308

Source: PIT samples, FARS.

Note: only wage-earners included.

Table 6: Shares of paid PIT, employee social contributions and net income in gross income

	Paid PIT	Employee social contributions	Net income	Gross income
2003	0.141	0.201	0.658	1.00
2004	0.143	0.201	0.657	1.00
2005	0.133	0.199	0.668	1.00
2016	0.120	0.197	0.683	1.00

Source: PIT samples, FARS.

Note: only wage-earners included.

This increase in the concentration coefficient for paid PIT simply means that the rich pay increasingly more taxes (as percentage of their gross income) than the poor. In spite of this increase in the concentration coefficient for paid PIT, the concentration coefficient for net income has actually increased in 2016. How can we explain this seemingly paradoxical result?

Let us write Rao's identity as:

$$G_x = \sum \frac{\mu_k}{\mu} C_k^x$$

where

μ_k = average value of income source k

μ = average value of total gross income; therefore:

$\frac{\mu_k}{\mu}$ = share of income source k in total income

G_x = Gini coefficient for gross income (x)

C_k^x = Concentration coefficient for income source k with ranking by gross income (x)

Denoting subscripts $k=N$ (for net income), $k=s$ (for social contributions) and $k=t$ (for PIT), we can write:

$$C_N^x = \frac{\mu}{\mu_N} (G_x - \frac{\mu_s}{\mu} C_s^x - \frac{\mu_t}{\mu} C_t^x)$$



Therefore

$$C_N^x = \frac{\mu}{\mu_N} G_x - \frac{\mu_s}{\mu_N} C_s^x - \frac{\mu_t}{\mu_N} C_t^x$$

Assuming constant income shares, one can write this equation as:

$$\Delta C_N^x = \frac{\mu}{\mu_N} \Delta G_x - \frac{\mu_s}{\mu_N} \Delta C_s^x - \frac{\mu_t}{\mu_N} \Delta C_t^x$$

showing how an increase in the concentration coefficient for personal income tax ($\Delta C_t^x > 0$) was not sufficient to neutralize the effects of an increase in the Gini coefficient and decrease in the concentration coefficient for employee social contributions (see table 5).

How do we explain the decrease in the concentration coefficient for employee social contributions? Given that capital income is not subject to payment of social contributions and that the share of capital income in gross income of wage-earners has increased and that capital income has become highly concentrated at the top of the income distribution, the decrease in the concentration coefficient for employee social contributions is hardly surprising.

Obviously, a concentration coefficient for taxes greater than the Gini coefficient for gross income indicates that the tax system is progressive (i.e. the share of taxes in the gross income of the rich is greater than the share of taxes in the gross income of the poor). If the concentration coefficient for taxes is equal to the Gini coefficient for gross income the tax system is proportional, i.e. taxes represent the same share of income of the poor and the rich. If the concentration coefficient for taxes is less than the Gini coefficient for gross income, then the tax system is regressive, i.e. the share of taxes in the gross income of the poor is greater than the share of taxes in the income of the rich.

All personal income tax systems are progressive. In order to measure the extent of progressivity of the tax system, we use the Kakwani measure of tax progressivity, defined as:

$$K_1 = C_t^x - G_x$$

This expression takes a rather narrow view of the tax system, as consisting only of the personal income tax. What about employee social contributions, which are also mandatory payments, deducted from gross income? The tax system and social protection system are not two separate and completely distinct entities. A number of social benefits are jointly tax and social contribution financed. For example, in Slovenia social contributions for maternity benefits and unemployment benefits cover only a small share of these expenditures, the larger part being covered by the state budget. Even for pensions, which represent a form of deferred wages, some 26 percent (in 2018) of total annual pension expenditures are covered by the state budget.

Though one cannot equate taxes and social contributions – as payment of social contributions entails certain social rights – nevertheless, one cannot deny that the boundary between the tax system and social protection system is not very clear. Thus, in order to explore the overall progressivity of the PIT and social contribution system, we define:



$$K_2 = C_{t+s}^x - G_x$$

where C_{t+s}^x represents the (joint) concentration coefficient for PIT and employee social contributions.

The values for both indices are presented in table 7.

Table 7: The Kakwani indices of tax progressivity

	Gini coefficient for gross income	Concentration coefficient for PIT	Concentration coefficient for joint PIT and social contributions	Kakwani index (K_1)	Kakwani index (K_2)
2003	0.346	0.549	0.430	0.203	0.084
2004	0.347	0.552	0.432	0.205	0.085
2005	0.345	0.586	0.441	0.241	0.096
2016	0.349	0.604	0.438	0.255	0.089

Source: PIT sample, FARS.

Note: only wage-earners included.

The Kakwani index K_1 shows a large increase in tax progressivity in 2005; this increase is due to the large increase in the personal allowance, set in the new PIT legislation (ZDoh-1). Further changes in the PIT legislation, with the introduction of a differentiated personal allowance in 2008 (Official Gazette of the Republic of Slovenia 10/2008) and a large increase in the personal allowance of the low-income group of taxpayers (Official Gazette of the Republic of Slovenia 13/2010) resulted in a further increase in the tax progressivity of the PIT system.

The Kakwani index K_2 , which could be viewed as a complementary measure to K_1 , provides a somewhat different perspective. Thus, the decrease in the Kakwani index K_2 in 2016 is due to the fact that capital income is not subject to social contributions. As capital income is concentrated in the high income groups, this lowers the overall share of mandatory payments (PIT and employee social contribution) in the gross income of the high-income group. This of course also impacts on the overall progressivity of the PIT and social contribution system.

7. Conclusion

Our research analysed some aspects of income dynamics and income inequality in Slovenia. The analysis was based on PIT data, thus including only income subject to tax. Also, only the group of wage earners was included. However, the trends visible for this (admittedly the largest!) group of taxpayers is also indicative for the whole population. Previous research did not include capital incomes from 2006 onwards, when schedular taxation of capital income was introduced. To rectify this deficiency, this research includes capital incomes, but only for the year 2016. In comparison with the pre-2006 years, the concentration of capital income at the very top of the income distribution (the top 1 %) has significantly increased in 2016, with some 64 % of the total capital income accruing to this group of taxpayers. Though the progressivity of the PIT system has been continuously increasing, the inclusion of social contributions into the »picture« leads to a more nuanced conclusion.

The share of capital income in total gross income has been continuously increasing, though it still represents a rather small share – only some 3 % of gross income of wage earners. Also, the



composition of capital income is now acquiring a more »normal« structure. Namely, the 2005 legislation (ZDoh-1) finally relegated most forms of royalty payments to labour income. The pre-2005 treatment of royalties simply represented a socialist »relict«, not rectified because of strong interests of influential groups.

Overall, the changes in income inequality, as measured by the Gini coefficient, are rather small. However, this masks some important changes. The share of income accruing to the top 1 % of wage earners has increased from 6.4 % in 2005 to 7.2 % in 2016, whereas the share accruing to the bottom 20 % of wage earners has decreased from 7.6 % to 7.1 %. The decreasing share accruing to the bottom 20% was – quite possibly – influenced by truncated nature of the PIT database prior to 2015; only persons liable to file a PIT tax return were included in the database.

In conclusion, we ought to state the obvious, namely that there is a clear need to monitor and analyse income dynamics on a continuous basis. This is required particularly because of the views held by the general public, which is imbued with false perceptions of the large income inequality in Slovenia. Our research therefore aims to provide some elements for an informed debate.



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