

## **THE REDISTRIBUTIVE ROLE OF FINANCIAL BURDEN ON PERSONAL INCOME IN THE YEARS 2008–2010**

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**Abstract.** Polish fiscal system contains different taxes as well as other tax-like payments. These are different payments, ie. obligatory public charges such as social insurance and health insurance contributions. These payments influence taxpayers' income and consequently also on the level of their welfare. The aim of this paper is to present the characteristics of the personal income tax (PIT), as well as the empirical evaluation of influence of PIT and social and health insurance contributions on the income situation of taxpayers. To reach the objective, the authors use two types of methods: assessment of conditions under which the personal income tax system becomes progressive and measures of structural progression.

**Key words:** personal income tax, taxpayers, fiscal system in Poland, measures of structural progression

### **INTRODUCTION**

The Polish system of financial burden embraces many taxes as well as other tax-like payments. Those include various types of payments, especially compulsory charges imposed on citizens by state, especially social security and health insurance contributions. They constitute financial burden on taxpayers' income, which subsequently influences their level of wealth.

This paper attempts to determine the role of the personal income tax and empirically evaluate the influence of that tax along with social security and health insurance contributions (i.e. own retirement pension insurance, disability pension insurance, accident and sickness insurance) on taxpayers' income.

In order to address this paper's aim, the following data was applied:

- assessment of conditions under which the personal income tax system becomes progressive, as defined in the work of N. Kakwani and P.J. Lambert [1997],
- measures of structural progression, i.e. a liability progression (LP) measure and a residual progression (RP) measure, applied by P.J. Lambert [2001].

A source information for the paper's subject matter was derived from POLTAX (the Polish system of tracking and recording data about Polish taxpayers). Data gathered refers to taxpayers who filed their personal income tax return forms (PIT) for the income years 2008–2010 to Fiscal Office in Siedlce.

## A DESCRIPTION OF THE PERSONAL INCOME TAX SYSTEM

Evaluation of the structure of budget revenue presented in Table 1 indicates that direct and indirect taxes constituted over 86% of total budget revenue in 2008, over 78% in 2009 and nearly 89% in 2010. The personal income tax comprised a very important part of the national budget revenue. Tax revenue represented over 15% of total budget revenue received in 2008, over 13% in 2009 and over 14% in 2010. However, most of this tax revenue derived from goods and services tax and excise duty – over 60% of total budget revenue in 2008, nearly 56% in 2009 and over 60% in 2010.

Table 1. The structure of budget revenue in the years 2008–2010  
Tabela 1. Struktura dochodów budżetowych w latach 2008–2010

No	Revenue items	Projected revenue (mln PLN)			Budget outturn (mln PLN)		
		for 2008	for 2009	for 2010	for 2008	for 2009	for 2010
	Revenue from the following:	281,892.1	272,911.5	249,006.6	253,547.3	274,183.5	250,302.8
1	Indirect tax including goods and services tax and excise duty	164,890.0	147,462.0	160,370.0	153,677.7	154,957.7	165,189.7
		163,900.0	145,900.0	159,270.0	152,272.9	153,381.6	163,564.8
2	Corporate income tax	27,150.0	24,000.3	26,300.0	27,159.7	24,156.6	21,769.9
3	Personal income tax	36,154.0	34,350.0	36,085.0	38,658.5	35,763.7	35,592.5
4	Tonnage tax and annulled taxes	0.4	0.0	0.0	3.5	0.8	0.5
5	Non-tax revenue	18,415.6	25,335.7	22,411.2	19,308.9	27,433.4	24,501.6
6	Non-refundable funds from the European Union and other sources	35,282.1	41,763.5	3,370.4	14,739.0	31,871.3	3,248.6

Source: Budget outturn report, Ministry of Finance, State Budget Department ([www.mf.gov.pl](http://www.mf.gov.pl)).

Źródło: Sprawozdanie operatywne z wykonania budżetu państwa, Ministerstwo Finansów, Departament Budżetu Państwa ([www.mf.gov.pl](http://www.mf.gov.pl)).

The structure of budget revenue presented in Table 1 indicates that the complex analysis of the amount and the distribution of tax burden requires also taking into consideration, besides the personal income tax, an indirect tax (and above all, goods and services tax and excise duty). In this paper, due to the very same reason, other relevant charges on personal income will also be taken into account, including: compulsory social security and health insurance contributions. Types of insurance enumerated in Table 2 are

undoubtedly closely related to the personal income tax. They are deductible against taxable income and against calculated tax due. Table 2 presents the amounts of particular contributions.

Table 2. Social security and health insurance contributions in the years 2008–2010  
Tabela 2. Składki na ubezpieczenia społeczne i składka zdrowotna w latach 2008–2010

Type of insurance	Insurance percentage rate incurred by	
	an employee (%)	an employer (%)
Own retirement pension insurance	9.76	9.76
Disability pension insurance	1.50	4.50
Sickness insurance	2.45	–
Accident insurance	–	from 0.67 to 3.33 <sup>a</sup>
Health insurance	9.00	9.00

<sup>a</sup>The principle of differentiating percentage rates of premiums in social insurance against accidents is defined in the Act of 30 October 2002 on social insurance in case of occupational accident or disease (consolidated text, Journal of Laws, 2009, No 167, Item 1322) and Regulation of the Minister of Labour and Social Policy of 29 November 2002 on differentiating percentage rates of premiums in social insurance against occupational accident and traumatic disease subject to different hazards and their effects (Journal of Laws, 2002, No 200, Item 16923, as amended).

Source: Self-prepared on the basis of information published by ZUS (Social Insurance Company).

Źródło: Opracowanie własne na podstawie informacji ogłaszanych przez Zakład Ubezpieczeń Społecznych.

Social security and health insurance premiums, as it has already been mentioned, are some type of expenses which are subject to deductions when calculating the tax amount due. The health insurance contribution rate in the years 2008–2010 amounted to 9%. Only 7.75% of that contribution's base was subject to tax deduction, not total amount of it. The amounts of premiums paid for own retirement pension, disability pension and sickness insurance were subject to deduction from income, that is they caused reduction of taxable base. Labour Fund and Employment Fund Contribution premiums constitute some indirect burden on income. Nevertheless, they will not be taken into account in the further analysis as they do not impose any direct influence on the amount of income tax.

By assumption, the personal income tax from the moment of its introduction on 1 January 1992 has been a progressive tax. Its progression results from marginal tax rates increasing over certain thresholds. Table 3 and 4 show the method of calculating tax. Such a structure indicates an existence of tax-exempt sum, which amounted to 3,089 PLN in the years 2008–2010, as well as an existence of marginal rates, which in 2008 amounted to: 19, 30 and 40%, while in the years 2009–2010 came to 18 and 32%. The personal income tax system also incorporates some preferential ways of taxation (joint taxation of spouses or taxation of persons single-handedly raising children), as well as tax allowances and exemptions. Owing to such a structure, personal income tax differentiates the amounts of burden imposed on certain groups of taxpayers and has an influence on the secondary distribution of income. Therefore, the progressive personal income tax is commonly used in order to reduce income inequality. Its redistributive role comprises its basic feature, next to its fiscal function. Generally, redistribution means, that as a result of certain taxation, inequalities are diminishing, that is the income of poorer people becomes relatively higher while the income of more affluent people becomes relatively lower.

Table 3. Tax brackets in force in the fiscal year 2008  
Tabela 3. Skala podatkowa obowiązująca w roku podatkowym 2008

Taxable base (PLN)		Tax amount (PLN)
above	up to	
	44,490.00	19% – 585.85
44,490.00	85,528.00	7,866.25 + 30% of excess above 44,490.00
85,528.00		20,177.65 + 40% of excess above 85,528.00

Source: Art. 10 sec. 2 of the Act of 16 November 2006 on amending the act on personal income tax and amending other acts (Journal of Laws, 2006, No 217, Item 1588).

Źródło: Art. 10 ust. 2 Ustawy z dnia 16 listopada 2006 r. o zmianie ustawy o podatku dochodowym od osób fizycznych oraz o zmianie innych ustaw (Dz.U. z 2006 r. nr 217, poz. 1588).

Table 4. Tax brackets in force in the fiscal years 2009–2010  
Tabela 4. Skala podatkowa obowiązująca w latach podatkowych 2009–2010

Taxable base (PLN)		Tax amount (PLN)
above	up to	
	85,528.00	18% – 556.02
85,528.00		14,839.02 + 32% excess above 85,528.00

Source: Art. 27 sec. 1 of the Act of 26 July 1991 on personal income tax, in the wording as of the date of 1 January 2009 (Journal of Laws, 2010, No 51, Item 307, as amended).

Źródło: Art. 27 ust. 1 Ustawy z dnia 26 lipca z 1991 r. o podatku dochodowym od osób fizycznych, w brzmieniu obowiązującym od 1 stycznia 2009 r. (Dz.U. z 2010 r. nr 51, poz. 307 z późn. zm.).

Personal income tax rate progression may be evaluated in the context of progressivity conditions suggested by Kakwani and Lambert [1997], according to which:

- firstly, the minimum principle of progression was defined as

$$x_i \geq x_j \Rightarrow t_i \geq t_j. \quad (1)$$

- secondly, the principle of progression was defined as

$$x_i \geq x_j \text{ and } t_i \geq t_j \Rightarrow \frac{t_i}{x_i} > \frac{t_j}{x_j}, \quad (2)$$

where:  $x_i, x_j$  – pretax income;

$t_i, t_j$  – tax amount due.

The condition defined in formula (1) signifies the minimal rate of increase of the tax amount due as the income increases. According to the above, imposing the very same tax on both higher and equal income is an essential precondition for tax progression. Tax progression as defined in formula (2) means not only higher amount of the tax burden but also higher income share that is payable as a tax. Every tax system which does not meet that requirement is defined as regressive. The condition (2) relevant herein, excludes a flat tax rate, for which an average tax rate  $\frac{t}{x}$  does not depend on the amount of income  $x$ .

## FINANCIAL BURDEN ON PERSONAL INCOME

Data in Tables 6, 7 and 8 presents personal income tax rates as well as social security and health insurance contributions in the years 2008–2010 respectively. They were defined depending on the amount of taxpayers' income.

Exclusively data about taxpayers engaged in non-agricultural business activities who filed their tax returns PIT-37 for the tax years 2008–2010 was applied to calculate certain amounts of burden. This group in 2008 consisted of 60.76% of all taxpayers in Siedlce and its administrative district, of 57.46% in 2009 and of 57.96% in 2010. Table 5 presents the structure of taxpayers, taking into consideration a type of tax return filed by them.

Table 5. The structure of taxpayers in relation to a type of tax return filed  
Tabela 5. Struktura podatników ze względu na rodzaj składanego zeznania podatkowego

A type of tax return filed	Number of taxpayers			Structure (%)		
	in 2008	in 2009	in 2010	in 2008	in 2009	in 2010
PIT-36	6,918	6,429	6,756	7.56	7.81	8.26
PIT36L	1,382	1,603	1,549	1.51	1.95	1.89
<b>PIT-37</b>	<b>55,595</b>	<b>47,277</b>	<b>47,390</b>	<b>60.76</b>	<b>57.46</b>	<b>57.96</b>
PIT-40	2,041	1,580	1,230	2.23	1.92	1.50
PIT-40A	25,563	25,392	24,851	27.94	30.86	30.39
Total	91,499	80,701	81,776	100.00	100.00	100.00

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

The results referring to personal income tax liabilities as well as social security and health insurance contributions that are presented in Tables 6, 7 and 8 indicate the redistributive role of those liabilities.

It needs to be underlined that the results displayed in Tables 6, 7 and 8 indicate that the tax burden analysed herein shows an upward tendency, taking into consideration the gross income received. The taxpayers whose yearly gross income did not exceed 5,000 PLN ranked lowest for tax burden reflected in percent (0.56% in 2008, 0.40% in 2009, 0.42% in 2010), whereas the taxpayers whose yearly gross income exceeded 120,000 PLN ranked highest (17.90% in 2008, 12.20% in 2009, 12.18% in 2010). The burden of compulsory social security contributions to the greatest degree was borne by persons with the lowest income of below 5,000 PLN (13.68% in 2008, 13.08% in 2009 and 13.66% in 2010), while it had the lowest influence on those with the income over 120,000 PLN (7.81% in 2008, 7.99% in 2009 and 8.06% in 2010). The reason for that is the fact that a taxpayer whose income exceeds the amount of 30 times the average monthly salary in economic organisations stops paying own retirement pension insurance and disability pension insurance premiums. Earning thresholds above which social security contributions plummeted were as follows: 90,000 PLN in 2008, 85,528 PLN in 2009 and 70,000 PLN in 2010. The rate of health insurance contributions was similar in 2008 as well as in 2009 and 2010, regardless of the income obtained (it ranged 7.00–7.89% in 2008, 6.86–

Table 6. Personal income tax liabilities along with social security and health insurance contributions in 2008

Tabela 6. Obciążenia z tytułu podatku dochodowego od osób fizycznych oraz z ubezpieczeń społecznych i ubezpieczenia zdrowotnego w 2008 roku

Specification	Annual gross income	Social security contributions	Health insurance contributions	Personal income tax	Total
	PLN				
I tax bracket	up to 5,000	13.68	5.41	0.56	19.65
	5,000–10,000	12.10	7.46	2.82	22.38
	10,000–15,000	13.31	7.89	3.96	25.16
	15,000–20,000	12.35	7.67	4.94	24.96
	20,000–25,000	12.13	7.63	5.42	25.18
	25,000–30,000	12.34	7.62	5.72	25.68
	30,000–35,000	12.59	7.62	5.91	26.12
	35,000–40,000	12.53	7.52	6.32	26.37
	40,000–44,490	12.49	7.44	6.55	26.48
II tax bracket	44,490–50,000	12.49	7.31	7.32	27.12
	50,000–55,000	12.20	7.28	7.98	27.46
	55,000–60,000	12.33	7.17	7.92	27.42
	60,000–65,000	12.33	7.26	8.50	28.09
	65,000–70,000	12.37	7.31	8.63	29.31
	70,000–75,000	12.34	7.13	8.89	28.36
	75,000–80,000	12.24	7.31	9.16	28.71
	80,000–85,528	12.21	7.34	9.33	28.88
III tax bracket	85,528–90,000	12.10	7.19	9.75	29.04
	90,000–95,000	11.56	7.26	10.20	29.02
	95,000–100,000	10.51	7.54	11.16	29.21
	100,000–105,000	11.53	7.27	11.83	30.63
	105,000–110,000	10.74	7.05	12.45	30.24
	110,000–115,000	8.92	7.00	12.77	28.69
	115,000–120,000	10.16	7.39	13.69	31.24
	over 120,000	7.81	7.39	17.90	33.10

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

7.86% in 2009 and 6.83–7.92% in 2010). It did not concern the taxpayers whose income was less than 5,000 PLN. That burden amounted to: 5.41, 5.61 and 5.64% relatively).

Moreover, it needs to be taken into account that the analysed personal income tax became a regressive tax in the following brackets: 50,000–55,000 PLN in 2008, 90,000–95,000 PLN in 2009, 15,000–20,000 PLN and 90,000–95,000 PLN. In the above mentioned brackets, the conditions defined by formulas (1) and (2) are not fulfilled, which means that tax burden of those taxpayers does not increase with the income growth. This, in turn, means that tax liabilities are not growing in relation to the higher income.

The characteristic of tax system to a large extent depends on the structure of income tax. The evaluation of the tax system properties may be conducted, among others, with

Table 7. Personal income tax liabilities along with social security and health insurance contributions in 2009

Tabela 7. Obciążenia z tytułu podatku dochodowego od osób fizycznych oraz z ubezpieczeń społecznych i ubezpieczenia zdrowotnego w 2009 roku

Specification	Annual gross income	Social security contributions	Health insurance contributions	Personal income tax	Total
	PLN				
I tax bracket	up to 5,000	13.08	5.61	0.40	19.09
	5,000–10,000	11.43	7.28	2.38	21.09
	10,000–15,000	13.02	7.86	3.52	24.40
	15,000–20,000	12.42	7.68	4.47	24.57
	20,000–25,000	12.09	7.61	4.88	24.58
	25,000–30,000	12.23	7.55	5.41	25.19
	30,000–35,000	12.35	7.55	5.56	25.46
	35,000–40,000	12.40	7.53	5.87	25.80
	40,000–45,000	12.37	7.45	6.18	26.00
	44,490–50,000	12.39	7.35	6.42	26.16
	50,000–55,000	12.18	7.31	6.78	26.27
	55,000–60,000	12.02	7.29	6.98	26.29
	60,000–65,000	12.02	7.26	7.34	26.62
	65,000–70,000	12.13	7.34	7.42	26.89
	70,000–75,000	12.18	7.19	7.62	26.99
	75,000–80,000	11.97	7.24	7.69	26.90
	80,000–85,528	12.32	7.27	7.99	27.58
II tax bracket	85,528–90,000	11.76	7.19	8.34	27.29
	90,000–95,000	11.20	7.08	8.60	26.88
	95,000–100,000	11.94	7.44	8.59	27.97
	100,000–105,000	11.52	7.28	8.68	27.48
	105,000–110,000	11.27	7.66	9.09	28.02
	110,000–115,000	10.93	6.76	9.21	26.90
	115,000–120,000	10.19	6.86	9.72	26.77
	over 120,000	7.99	7.26	12.20	27.45

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

the help of measures of structural progression applied by P.J. Lambert in 2001. Especially two measures of structural progression are crucial.

The first, defined as liability progression (*LP*), is expressed with the following formula:

$$LP(x) = \frac{m(x)}{a(x)} \quad (3)$$

where:  $a(x) = \frac{t}{x}$  – is an average tax rate due for an income  $x$ ;

$m(x) = \frac{\hat{t}}{\hat{x}}$  – is a marginal tax rate due for an income  $x$ .

Table 8. Personal income tax liabilities along with social security and health insurance contributions in 2010

Tabela 8. Obciążenia z tytułu podatku dochodowego od osób fizycznych oraz z ubezpieczeń społecznych i ubezpieczenia zdrowotnego w 2010 roku

Specification	Annual gross income	Social security contributions	Health insurance contributions	Personal income tax	Total
	PLN				
I tax bracket	up to 5,000	13.66	5.64	0.42	19.72
	5,000–10,000	11.50	7.29	2.43	21.22
	10,000–15,000	13.01	7.92	3.54	24.47
	15,000–20,000	12.49	7.64	5.14	25.27
	20,000–25,000	12.17	7.63	4.58	24.38
	25,000–30,000	12.10	7.53	5.44	25.07
	30,000–35,000	12.35	7.52	5.76	25.63
	35,000–40,000	12.31	7.49	6.15	25.95
	40,000–45,000	12.32	7.41	6.39	26.12
	44,490–50,000	12.34	7.37	6.63	26.34
	50,000–55,000	12.23	7.26	6.91	26.40
	55,000–60,000	11.98	7.29	7.17	26.44
	60,000–65,000	11.98	7.39	7.33	26.70
	65,000–70,000	12.10	7.10	7.58	26.78
	70,000–75,000	11.67	7.22	7.66	26.55
	75,000–80,000	11.64	7.13	7.80	26.57
	80,000–85,528	11.50	6.83	7.92	26.25
II tax bracket	85,528–90,000	11.17	6.90	8.16	23.23
	90,000–95,000	11.23	6.93	8.63	23.79
	95,000–100,000	10.77	7.19	8.55	26.51
	100,000–105,000	10.96	7.17	8.67	26.80
	105,000–110,000	10.94	7.26	9.22	27.42
	110,000–115,000	11.15	7.17	9.31	27.63
	115,000–120,000	9.89	7.52	9.53	26.94
over 120,000	8.06	7.30	12.18	27.54	

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

Tax brackets are progressive if for any level of income where tax amount due is more than 0, so  $a(x) > 0$ , the following condition  $m(x) > a(x)$  is fulfilled, that is  $LP(x) > 1$ .

The second measure is residual progression ( $RP$ ):

$$RP(x) = \frac{1 - m(x)}{1 - a(x)} \quad (4)$$

The condition for progressive tax rates is fulfilled for  $RP(x) < 1$ .

Values specifying the ranges of liability progression  $LP(x)$  and residual progression  $RP(x)$  in Table 9 for the year 2008, in Table 10 for the year 2009 and Table 11 for the year 2010, were calculated relatively according to formulas (3) and (4) in points referring to an average income from a particular bracket.



Table 9. Liability progression and residual progression in 2008  
 Tabela 9. Progresja zobowiązań oraz progresja resztowa w 2008 roku

Specification	Annual gross income (PLN)	Average tax rate (%)	Marginal tax rate (%)	$LP(x)$	$RP(x)$
I tax bracket	up to 5,000	0.56	3.58	6.39	0.97
	5,000–10,000	2.82	5.98	2.12	0.97
	10,000–15,000	3.96	7.19	1.82	0.97
	15,000–20,000	4.94	7.09	1.44	0.98
	20,000–25,000	5.42	7.03	1.30	0.98
	25,000–30,000	5.72	7.00	1.22	0.99
	30,000–35,000	5.91	8.92	1.51	0.97
	35,000–40,000	6.32	8.43	1.33	0.98
	40,000–44,490	6.55	13.74	2.10	0.92
II tax bracket	44,490–50,000	7.32	13.97	1.91	0.96
	50,000–55,000	7.98	7.26	0.91	1.01
	55,000–60,000	7.92	15.14	1.91	0.92
	60,000–65,000	8.50	10.19	1.20	0.98
	65,000–70,000	8.63	12.48	1.45	0.96
	70,000–75,000	8.89	12.97	1.46	0.96
	75,000–80,000	9.16	11.81	1.29	0.97
III tax bracket	80,000–85,528	9.33	16.95	1.82	0.92
	85,528–90,000	9.75	18.47	1.89	0.90
	90,000–95,000	10.20	28.29	2.77	0.80
	95,000–100,000	11.16	25.10	2.25	0.84
	100,000–105,000	11.83	25.47	2.15	0.85
	105,000–110,000	12.45	19.22	1.54	0.92
	110,000–115,000	12.77	36.29	2.84	0.73
	115,000–120,000	13.69	27.44	2.00	0.84
	over 120,000	17.90			

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

Calculations shown in Tables 9, 10 and 11 indicate that:

- First of all, the income tax in the following brackets is not a progressive tax: 50,000–55,000 PLN in 2008, 90,000–95,000 PLN in 2009, 15,000–20,000 PLN and 90,000–95,000 PLN in 2010. It does not meet the condition for progression included in formula (3) according to which  $LP(x) > 1$ . Moreover, it needs to be taken into account that the tax is only slightly progressive in the other income ranges, i.e. 15,000–40,000 PLN, 60,000–80,000 PLN and 105,000–110,000 PLN in 2008, 15,000–20,000 PLN, 25,000–55,000 PLN, 60,000–75,000 PLN, 95,000–100,000 PLN and 105,000–110,000 PLN in 2009, 20,000–85,528 PLN, 95,000–100,000 PLN and 105,000–115,000 PLN in 2010. The biggest progression can be seen in the following income tax brackets: 0–5,000 PLN, 90,000–95,000 PLN and 110,000–115,000 PLN in 2008, and 0–5,000 PLN in 2009 and 2010. It means that in those income ranges income inequalities are reduced to a larger extent.
- Second of all, considering the assumption reflected in formula (4), according to which the condition for progression is fulfilled for  $RP(x) < 1$ , the tax brackets for the taxpay-

Table 10. Liability progression and residual progression in 2009  
 Tabela 10. Progresa zobowiązań oraz progresja resztowa w 2009 roku

Specifi- cation	Annual gross income (PLN)	Average tax rate (%)	Marginal tax rate (%)	$LP(x)$	$RP(x)$
I tax bracket	up to 5,000	0.40	3.11	7.78	0.97
	5,000–10,000	2.38	5.28	2.22	0.97
	10,000–15,000	3.52	6.80	1.93	0.97
	15,000–20,000	4.47	6.27	1.40	0.98
	20,000–25,000	4.88	7.79	1.60	0.97
	25,000–30,000	5.41	6.42	1.19	0.99
	30,000–35,000	5.56	7.88	1.42	0.98
	35,000–40,000	5.87	8.47	1.44	0.97
	40,000–45,000	6.18	8.50	1.38	0.98
	45,000–50,000	6.42	10.17	1.58	0.96
	50,000–55,000	6.78	9.34	1.38	0.97
	55,000–60,000	6.98	11.23	1.61	0.95
	60,000–65,000	7.34	8.35	1.14	0.99
	65,000–70,000	7.42	10.32	1.39	0.97
	70,000–75,000	7.62	8.76	1.15	0.99
	75,000–80,000	7.69	12.30	1.60	0.95
	80,000–85,528	7.99	14.20	1.78	0.93
II tax bracket	85,528–90,000	8.34	13.36	1.60	0.95
	90,000–95,000	8.60	8.48	0.99	1.00
	95,000–100,000	8.59	10.51	1.22	0.98
	100,000–105,000	8.68	17.26	1.99	0.91
	105,000–110,000	9.09	11.95	1.31	0.97
	110,000–115,000	9.21	20.91	2.27	0.87
	115,000–120,000	9.72	17.60	1.81	0.91
	above 120,000	12.20			

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.  
 Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

ers from Siedlce and its administrative district, in force in the fiscal years 2008–2011, were not progressive in the following income ranges: 50,000–55,000 PLN in 2008, 90,000–95,000 PLN in 2009, 15,000–20,000 PLN and 90,000–95,000 PLN in 2010. In the remaining income ranges brackets were close to the proportional (flat) ones. In those income ranges the value of residual progression measure was within the following bounds: 0.92–0.99 in the first tax bracket, 0.92–0.98 in the second tax bracket and 0.73–0.92 in the third one in 2008. Whereas, in the years 2009–2010 it was within the range of 0.93–0.99 and 0.90–0.99 in the first tax bracket and 0.87–0.98 in the second one respectively. That allows to draw a conclusion that personal income tax in the years 2008–2010 to a small extent helped in reducing taxpayers' income inequality.

Table 11. Liability progression and residual progression in 2010  
 Tabela 11. Progresa zobowiązań oraz progresja resztowa w 2010 roku

Specifica- tion	Annual gross income (PLN)	Average tax rate (%)	Marginal tax rate (%)	$LP(x)$	$RP(x)$
I tax bracket	up to 5,000	0.42	3.11	7.40	0.97
	5,000–10,000	2.43	5.21	2.14	0.97
	10,000–15,000	3.54	7.16	2.02	0.96
	15,000–20,000	5.14	7.08	0.98	1.00
	20,000–25,000	4.58	6.79	1.48	0.98
	25,000–30,000	5.44	7.52	1.38	0.98
	30,000–35,000	5.76	8.69	1.51	0.97
	35,000–40,000	6.15	8.21	1.33	0.98
	40,000–45,000	6.39	8.65	1.35	0.98
	45,000–50,000	6.63	9.62	1.45	0.97
	50,000–55,000	6.91	9.89	1.43	0.97
	55,000–60,000	7.17	9.15	1.28	0.98
	60,000–65,000	7.33	10.72	1.46	0.96
	65,000–70,000	7.58	8.76	1.16	0.99
	70,000–75,000	7.66	9.75	1.27	0.98
	75,000–80,000	7.80	9.70	1.24	0.98
80,000–85,528	7.92	12.07	1.52	0.95	
II tax bracket	85,528–90,000	8.16	17.49	2.14	0.90
	90,000–95,000	8.63	7.00	0.81	1.02
	95,000–100,000	8.55	11.12	1.30	0.97
	100,000–105,000	8.67	20.29	2.34	0.87
	105,000–110,000	9.22	11.32	1.23	0.98
	110,000–115,000	9.31	14.35	1.54	0.94
	115,000–120,000	9.53	17.88	1.88	0.94
	above 120,000	12.18			

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

## TAX ON PERSONAL INCOME

In 2008 nearly 79% of all taxpayers in Siedlce and its administrative district who filed a PIT-37 tax return form fell in the first tax bracket, 14% fell in the second tax bracket and nearly 7% in the third one. That has been shown in Table 12.

Whereas:

- In 2009<sup>1</sup>, as shown in Table 13, the income of over 95% of all taxpayers in Siedlce and its administrative district who filed a PIT-37 tax return form fell into the first

<sup>1</sup>Important changes in the personal income tax came into effect on 1 January 2009. They have significantly influenced the amount of tax burden and personal income distribution. The introduction of two tax brackets was one of the most crucial changes implemented. Instead of the three tax rates valid from 31 December 2008: 19, 30 and 40%, starting from 1 January 2009 only two following tax rates have been in force: 18 and 32%.

- tax bracket. The income of only 7% of them was taxed at a rate in the second tax bracket.
- As shown in Table 14, in 2010 the income of over 95% of all taxpayers in Siedlce and its administrative district who filed a PIT-37 tax return form fell into the first tax bracket. The income of only 5% of them was taxed at a rate in the second tax bracket.

Table 12. Structure of taxpayers (by tax brackets) who filed a PIT-37 tax return form in the fiscal year 2008

Tabela 12. Struktura podatników według przedziałów podatkowych rozliczających się na formularzu PIT-37 w roku podatkowym 2008

Taxable base (PLN)		Number of taxpayers	Structure (%)	Tax due	Structure (%)
above	up to				
–	43,405	41,998	78.83	27,982,134	37.52
43,405	85,528	7,604	14.27	24,155,581	32.39
85,528	–	3,672	6.90	22,443,455	30.09

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

It is indicated in Tables 12, 13 and 14 that, in comparison to 2008, in the years 2009–2010 the share of taxpayers with an income less than 85,528 PLN increased from 93.10% to 95.21 and 94.77% respectively. However, it should be taken into consideration that despite the increase in the share of the above mentioned group of taxpayers, in comparison to 2008, their share in the tax due (they have payed) decreased by 2.32% in 2009 and by 2.64% in 2010. That means that the decrease in the share of taxpayers with an income higher than 85,528 PLN had an influence on the increase of their share in the tax due by 2.32% in 2009 and by 2.64% in 2010 in comparison to 2008.

Table 13. Structure of taxpayers (by tax brackets) who filed a PIT-37 tax return form in the fiscal year 2009

Tabela 13. Struktura podatników według przedziałów podatkowych rozliczających się na formularzu PIT-37 w roku podatkowym 2009

Taxable base (PLN)		Number of taxpayers	Structure (%)	Tax due	Structure (%)
above	up to				
	85,528	45,011	95.21	61,790,738	67.59
85,528		2,266	4.79	29,627,879	32.41

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

Personal income tax differentiates the amount of burden imposed on particular groups of taxpayers and affects the redistribution of income. That results from the system of tax brackets (progressive tax system), tax allowance and exemption system including the deduction of social security contributions from an income and health insurance contribution from the tax as well as the existence of an exempt amount. Moreover, it needs to be added that the system of personal income tax is closely connected to the system of social security insurance.

Table 14. Structure of taxpayers (by tax brackets) who filed a PIT-37 tax return form in the fiscal year 2010

Tabela 14. Struktura podatników według przedziałów podatkowych rozliczających się na formularzu PIT-37 w roku podatkowym 2010

Taxable base (PLN)		Number of taxpayers	Structure (%)	Tax due	Structure (%)
above	up to				
	85,528	44,910	94.77	66,667,995	67.27
85,528	–	2,480	5.23	32,441,151	32.73

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

Tables 15, 16 and 17 present an effective imposition of personal income tax and tax-like contributions (social security and health insurance contributions).

Table 15. Effective tax rate by tax brackets for taxpayers who filed a PIT-37 tax return form in the fiscal year 2008

Tabela 15. Efektywna stopa podatkowa według przedziałów skali podatkowej podatników rozliczających się na formularzu PIT-37 w roku podatkowym 2008

Taxable base (PLN)		Tax rate (%)	Effective tax rate (%)	The result of subtraction in percentage points (3–4)
above	up to			
–	44,490	19	5.23	13.77
44,490	85,528	30	8.30	21.70
85,528		40	14.47	25.53
Total		–	7.87	–

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

In 2008 an effective tax rate for the taxpayers in Siedlce and its administrative district who gained an income higher than 85,528 PLN amounted to 14.47%. In the years 2008–2010 it was 10.46% and 10.44% respectively for the same group of taxpayers. It indicates that changes in marginal tax rates from 2009 in the personal income tax proved to be most beneficial for the taxpayers who earned more than 85,528 PLN. Those changes also proved to be beneficial for the taxpayers in Siedlce and its administrative district whose income fell in between the range limits of 44,490–85,528 PLN. The reason for that was the fact that the effective tax rate dropped by 2.57% in 2009 and by 2.33% in 2010. Yet, for the taxpayers whose income did not exceed 44,490 PLN, the effective tax rate slightly increased: by 0.50% in 2009 and by 0.74% in 2010. That means that changing the marginal tax rates was not beneficial at all or only slightly beneficial for that group of taxpayers.

The sum total of the effective income tax incurred by all taxpayers in 2008 was fluctuating around the level of 7.87%, in 2009–6.74% and in 2010–6.94%. The reduction in the

Table 16. Effective tax rate by tax brackets for taxpayers who filed a PIT-37 tax return form in the fiscal year 2009

Tabela 16. Efektywna stopa podatkowa według przedziałów skali podatkowej podatników rozliczających się na formularzu PIT-37 w roku podatkowym 2009

Taxable base (PLN)		Tax rate (%)	Effective tax rate (%)	The result of subtraction in percentage points (3–4)
above	up to			
–	85,528	18	5.73	12.27
85,528.00	–	32	10.46	21.54
Total		–	6.74	–

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

Table 17. Effective tax rate by tax brackets for taxpayers who filed a PIT-37 tax return form in the fiscal year 2010

Tabela 17. Efektywna stopa podatkowa według przedziałów skali podatkowej podatników rozliczających się na formularzu PIT-37 w roku podatkowym 2010

Taxable base (PLN)		Tax rate (%)	Effective tax rate (%)	The result of subtraction in percentage points (3–4)
above	up to			
–	85,528.00	18	5.97	12.03
85,528.00	–	32	10.44	21.56
Total		–	6.94	–

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedlcach.

sum total of the effective tax rate by 1.13% in 2009 and by 0.93% in 2010 in comparison to 2008 signifies that progression in the tax is weakened<sup>2</sup>.

The result of calculating an effective tax burden on the taxpayers from Siedlce and its administrative district whose income did not exceed the amount of 85,528 PLN comes out of the fact that effective tax rate is an average for the whole tax bracket, which held 93.10% of taxpayers in 2008, 95.21% in 2009 and 94.77% in 2010. That group of taxpayers includes also such persons who gained income lower than (or equal) 5,000 PLN. There were 8,576 such taxpayers in 2008, 7,428 in 2009 and 7,061 in 2010. The group also consists of persons who earned nearly 85,528 PLN. There were 426 such taxpayers in 2008, 439 in 2009 and 480 in 2010. As an example, Table 18 shows a gross income burden of a personal income tax by effective tax rate for the taxpayers from Siedlce and its administrative district whose income in the years 2008–2010 fell within the range limits of 5,000–10,000 PLN and 80,000–85,528 PLN.

Analysis of the example from Table 18 enables to notice that in 2008 the effective tax rate is only slightly more than 3 times higher for an income nearly 11 times higher. In

<sup>2</sup>A weakening of the tax progression signifies that the personal income tax fulfils its redistributive role to a lesser extent.

Table 18. Effective tax rate for tax brackets 5,000–10,000 PLN and 80,000–85,528 PLN of the taxpayers from Siedlce and its administrative district who filed a PIT-37 tax return form in the fiscal years 2008–2010

Tabela 18. Efektywna stopa podatkowa dla przedziałów dochodowych od 5000 zł do 10 000 zł oraz od 80 000 zł do 85 528 zł podatników miasta Siedlce i jego powiatu rozliczających się na formularzu PIT-37 w latach podatkowych 2008–2010

Taxable base (PLN)		Average income (PLN)	Effective tax rate (%)
above	up to		
2008			
5,000	10,000	7,732.29	2.82
80,000	85,528	82,771.78	9.33
2009			
5,000	10,000	7,481.10	2.38
80,000	85,528	82,769.13	7.99
2010			
5,000	10,000	7,478.41	3.54
80,000	85,528	82,820.13	7.92

Source: Self-prepared calculation based on the data from the Tax Office in Siedlce POLTAX system.

Źródło: Obliczenia własne na podstawie danych z systemu POLTAX Urzędu Skarbowego w Siedleach.

the years 2008–2010 for an income over 11 times higher, the effective tax rate is, respectively, only over 3 times higher and over twice as high. The conclusion can be drawn that dependency between the amount of income earned by the taxpayers from Siedlce and its administrative district and the amount of the effective tax rate can be described as mildly progressive.

## CONCLUSIONS

On the basis of the above reflections, a conclusion may be drawn that for a significant majority of taxpayers who do not conduct any non-agricultural business activities in Siedlce and its administrative district and who file a PIT-37 tax return form, the personal income tax system is mildly progressive. It is indicated by the volume of burden imposed by the above mentioned tax in the years 2008–2010, which only slightly increases with income. That is also shown in the calculation of the following measures: liability progression and residual progression. Nevertheless, it needs to be taken into account that progressivity of personal income tax is not identical for every tax bracket.

Furthermore, in the following tax brackets:

- 50,000–55,000 PLN in 2008,
- 90,000–95,000 PLN in 2009,
- 15,000–20,000 and 90,000–95,000 PLN in 2010,

personal income tax is a regressive tax as the personal income tax rate falls with an increase in income. That is also shown in the calculated measures of liability progression and residual progression.

In case of the tax-like burden, it needs to be pointed that social security contributions are regressive. The burden rate imposed by them slightly declines with an increase

of taxpayers' income. Whereas, in case of the analysed health insurance contributions, the results for the average burden rate imposed by them indicate its proportional (flat) character.

All in all, personal income tax system together with the social security system in the years in question herein had a very slight impact on the amount and differentiation of the income of its taxpayers. The reasons for insignificant influence on the distribution of personal income and the amount of tax burden are as follows:

- Firstly, tax burden only slightly increases with income, which indicates that tax liability does not relatively increase with income level (this statement is also confirmed by an example shown in Table 18). In a few cases it even decreases as income rises, which subsequently means that in those cases the tax burden on higher incomes is lower.
- Secondly, calculation of the following measures: liability progression and residual progression shows that income taxation system is only slightly progressive or even regressive.

Moreover, it should be stated that the redistributive role of personal income tax weakened after the introduction of a two-rate income tax scale in 2009. Changes introduced in tax rates proved to be most advantageous to taxpayers whose income exceeded an amount of 85,528 PLN (there was the steepest decrease in the effective tax rate for that particular group of taxpayers in comparison to 2008). Whereas, those changes had no beneficial effect on the taxpayers who obtained income of up to 44,490 PLN. They have observed an increase in the effective tax rate in comparison to 2008. The total reduction of the effective tax rate for all taxpayers in the years 2008–2009 in comparison to 2008 resulted in reduced tax progression (in the years 2009–2010 the personal income tax played much smaller redistributive role in comparison to 2008).

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## REDYSTRYBUCYJNA ROLA OBCIĄŻEŃ FINANSOWYCH OSÓB FIZYCZNYCH W LATACH 2008–2010

**Streszczenie.** Polski system obciążeń finansowych obejmuje wiele podatków, jak też inne świadczenia o charakterze parapodatkowym. Są to różnego rodzaju opłaty, a przede wszystkim obowiązkowe obciążenia publiczne, szczególnie składki na ubezpieczenia społeczne i składka zdrowotna. Stanowią one obciążenie dochodów podatników, wpływając tym samym na poziom ich dobrobytu. Celem opracowania jest próba określenia właściwości podatku dochodowego od osób fizycznych oraz empiryczna ocena jego wpływu i obciążeń z tytułu ubezpieczeń społecznych (tj. ubezpieczenia emerytalnego, rentowego, chorobowego oraz wypadkowego) i ubezpieczenia zdrowotnego na sytuację dochodową podatników.



Autorzy artykułu wykorzystują ocenę warunków progresywności systemu podatku dochodowego od osób fizycznych oraz miary progresji strukturalnej.

**Słowa kluczowe:** podatek dochodowy od osób fizycznych, podatnicy, system podatkowy w Polsce, miary progresji strukturalnej

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