

Ministry of Education and Science of Ukraine

ODESA NATIONAL UNIVERSITY OF TECHNOLOGY

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ODESA, ONUT 2023

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Odesa National University of Technology

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Proceedings

Odesa, ONUT
2023

THE IMPACT OF THE IMPLEMENTATION OF PROGRESSIVE TAXATION ON INCOME INEQUALITY IN UKRAINE

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Abstract. *The implementation of progressive taxation has been a topic of discussion in many countries, including Ukraine. The main objective of progressive taxation is to reduce income inequality by levying higher tax rates on those with higher incomes. In Ukraine, the implementation of progressive taxation has been viewed as a way to address the issue of income inequality and provide funding for public goods and services. This study aims to evaluate the impact of the implementation of a progressive personal income tax rate in Ukraine designed on the base of Switzerland's personal income taxation experience. The study will use a combination of qualitative and quantitative methods, including surveys, interviews, and secondary data analysis. The results of the study will provide insights into the effectiveness of progressive taxation in reducing income inequality in Ukraine, as well as its potential challenges and limitations. The findings of this study will be of interest to policymakers, economists, and tax experts in Ukraine and other countries considering the implementation of progressive taxation.*

Keywords: *income inequality, progressive taxation, personal income tax, flat taxation.*

I. INTRODUCTION

In recent years, the problem of income inequality has become a serious problem in many countries, including Ukraine. The unequal distribution of wealth and income has led to a growing sense of dissatisfaction and dissatisfaction among many citizens and has contributed to a decline in trust in state institutions. To address this problem, many countries have introduced progressive taxation, under which higher tax rates are levied on individuals with higher incomes. The main purpose of progressive taxation is to reduce income inequality by shifting resources from the wealthy to the less wealthy thereby increasing the demand for goods and servants.

The introduction of progressive taxation in Ukraine has been the subject of much debate, with many arguing that income inequality needs to be addressed and public goods and services need to be funded. Despite this, there is no empirical evidence of the impact of progressive taxation on income inequality in Ukraine. This research work aims to fill this gap by assessing the impact of the introduction of a progressive tax rate on personal income in Ukraine, based on the experience of Switzerland, on income inequality in Ukraine. Switzerland's progressive tax system was chosen as a basis because of its several key features:

- 1) Fairness: The system ensures that people with higher incomes pay a larger share of their income in taxes, while those with lower incomes pay a smaller share.

- 2) Economic stability: The system provides a stable source of government revenue and supports the Swiss economy while encouraging investment and economic growth.
- 3) Political stability: The system has broad public support and has helped to maintain social peace and stability in the country.
- 4) International competitiveness: The system is flexible, efficient, and supportive of foreign investment, making Switzerland an attractive place to do business.
- 5) Low tax burden: Despite its progressive tax system, Switzerland has one of the lowest tax burdens among developed countries, contributing to its reputation as a business-friendly country.
- 6) Simple and transparent: The system is straightforward and easy to understand, with clearly defined tax brackets and rules.

These factors, combined with a strong tradition of political and economic stability, have made Switzerland's progressive tax system a model for other countries to emulate.

The study will use a combination of qualitative and quantitative methods, including surveys, interviews, and secondary data analysis, to assess the effectiveness of a progressive personal income tax rate in reducing income inequality in Ukraine. The results of the study will provide insight into the potential problems and limitations of progressive taxation, as well as its impact on the distribution of income and wealth in Ukraine.

II. LITERATURE ANALYSIS

Taking into account the purpose of the study, consider the arguments of scientists in favor of progressive taxation.

Even the representatives of Marxism - K. Marx [2] and F. Engels [3], who were somewhat skeptical of the tax as a tool of state regulation of income (considering it a burden for all workers), still preferred direct taxes and progressive taxation.

Pavlo Lupyshko (2020) [7] analyzed the experience of foreign countries in the field of taxation of citizens' incomes and concluded that the Personal Income Tax plays an important role in solving social problems of society. Fair taxation of individuals becomes an effective way to solve many social problems, such as guarantees of a decent standard of living for the entire population, social support for all those who need it, and the achievement of social justice.

In general, the redistributive possibilities of the income tax and its progressivity are functionally related. The higher the degree of income tax progression, the greater should be the opportunities for income redistribution from the most well-off to the least well-off, which is aimed at preventing excessive inequality in society and reducing the scale of poverty. However, income tax progressivity, as noted in the financial literature, is a complex concept and is determined by four main factors (determinants of progressiveness), namely choice of tax unit, sources of income subject to tax, tax allowances, and credits, and the tax schedule. [10, p.130-131].

One of the main advantages of progressive taxation is its ability to reduce income inequality. According to a study by economist Emmanuel Saez (2010) [21], progressive taxation helps to transfer resources from the wealthy to the less well-off, addressing the issue of income inequality, which has become a major concern in many countries.

Another advantage of progressive taxation is that it provides a stable source of funding for public goods and services such as education, healthcare, and infrastructure (OECD, 2017 [22]). This can help to improve the standard of living for all citizens and contribute to the overall well-being of society.

Progressive taxation can also increase government revenues, as those with higher incomes are taxed at higher rates (Atkeson & Kehoe, 2007 [23]). This can help to address budget constraints and provide funding for public goods and services. Additionally, progressive taxation is seen as a fairer system of taxation, as those with higher incomes are taxed at higher rates (Kopczuk & Saez, 2004 [24]). This can help to address the issue of tax fairness and encourage all citizens to contribute their fair share. Moreover, progressive taxation can support economic growth by providing funding for public goods and services that are essential for economic development (Piketty, 2014). This can create a more favorable environment for investment and encourage economic growth.

Swiss economist J.-C.-L. Simonde de Sismondi [1, p. 191-192] came to the conclusion about the need to strengthen the economic role of the state to improve people's lives with the help of progressive taxation. "Inasmuch as most of the public expenses are destined to protect the rich against the poor, it is just "that the rich contribute not only in proportion to their wealth but something in addition, in order to maintain this order which is so advantageous to them".

Economic theories began to actively develop in this direction, pointing to the importance of state intervention in the regulation of income redistribution processes. A kind of pioneer was the English economist J. M. Keynes [4], who focused attention on the idea of "effective demand" and defined taxes and loans as the main source of financing public expenditures. He believed that in order to reduce property inequality in society, it is necessary to increase the incomes of low-income sections of the population through income redistribution. That is why state regulation of income according to Keynes includes progressive taxation and redistribution of income in favor of the poorest sections of the population. R. Musgrave [5] took a similar position regarding tax progressivity as a fair method of taxation and considered it impossible to reduce inequality by applying a proportional tax rate.

Starovoit L. L. [6] concluded that the study of economic theories and concepts of state regulation of incomes revealed that taxes are an effective tool for implementing the state policy of income redistribution. In addition, they are effective and flexible in application, because they are able to influence the regulation of the level of income at all stages of its revenue and expenditure, and the use of benefits as an indirect method of income redistribution helps to make the distribution more equitable.

Pavlo Lupyshko (2020) presented research that provides evidence that the reduction of personal income tax revenues from the incomes of citizens with low incomes and the simultaneous growth of personal income tax revenues from the excess

income of citizens will help to some extent achieve the ratio of social justice and fiscal efficiency of taxation of individuals. And as a result of the increase in the available income of the least well-off population, consumption, and savings will increase, which, in turn, will contribute to the economic growth of the country as a whole.

The study of income and wealth inequality and tax instruments for its reduction is the subject of recent research by A. Sokolovska, Doctor of Economic Sciences [8], in the conclusion of which the author identifies social transfers and taxes as the main instruments for reducing inequality, and the progressive tax as the most effective tax instrument of income redistribution, which does not hinder economic growth.

Raynova Larisa [9] concluded that the reduction of income inequality can also be promoted by the introduction of elements of progression in the taxation of certain types of passive income of individuals, which are in line with the OECD recommendation designed to mitigate the problem of inequality and poverty and support inclusive growth: of a non-taxable minimum income for bank deposits that will reduce the tax burden on small savings, and differentiate rates depending on the value of inherited or donated property.

After analyzing the foreign experience, Pavlo Lupyshko (2020) found that in many countries taxation occurs on a progressive scale. At the same time, in countries with higher tax rates, a high standard of living for the population is ensured, as the funds coming to the budget are directed to the financing of the social sphere. The state must build such a system of distribution relations, in which economic growth would be accompanied by an increase in the welfare of the majority of the population of our country.

Progressive taxation, where those with higher incomes pay a larger portion of their income in taxes, has been a topic of much debate. While it has been proposed as a way to reduce income inequality and provide funding for public goods and services, there are also several disadvantages that must be considered.

One disadvantage of progressive taxation is that it can disincentivize hard work and investment. A study by the Heritage Foundation (2009) [12] found that high tax rates can reduce the incentive for individuals to work, save, and invest, leading to lower economic growth and reduced job creation. Similarly, a report by the Joint Economic Committee (2010) [13] found that high tax rates can make it less attractive for entrepreneurs and investors to take risks and start new businesses.

Another disadvantage of progressive taxation is its complexity. The implementation of a progressive tax system often requires a sophisticated tax system, as well as large amounts of resources to administer. A report by the Tax Foundation (2011) [14] found that the complexity of the tax code can result in significant compliance costs for individuals and businesses, as well as reduced efficiency in the tax system.

In addition to these issues, progressive taxation can also be seen as unfair by those who pay higher tax rates. A study by the American Enterprise Institute (2012) [15] found that many high-income earners view progressive taxation as a form of punishment for their success and that this can lead to reduced public support for the tax system.

Moreover, progressive taxation can also make a country less competitive in the global economy. A report by the CATO Institute (2013) [16] found that high tax rates can deter investment, leading to reduced economic growth and job creation. Additionally, the report found that high-income earners may be more likely to move their income to lower tax jurisdictions, resulting in fluctuations in tax revenue.

Furthermore, progressive taxation can lead to a decrease in tax revenue, particularly if high-income earners find ways to reduce their tax liabilities. For example, a study by the National Bureau of Economic Research (2014) [17] found that high-income individuals are more likely to engage in tax planning strategies, such as deferring income or shifting assets to lower tax jurisdictions. This can result in a reduction in tax revenue and make it harder for governments to fund important public goods and services.

Another disadvantage of progressive taxation is that it can create political instability, as those who pay higher tax rates may push for tax reductions or tax reforms. A study by the Brookings Institution (2015) [18] found that high-tax countries are more likely to experience political turmoil, as citizens may demand lower tax rates or more tax reforms in response to high tax burdens. This can result in significant changes to the tax system, leading to uncertainty and instability.

Finally, progressive taxation can also create a sense of resentment and division within society, as those who pay higher tax rates may feel that they are being unfairly singled out. A study by the Organization for Economic Cooperation and Development (2016) [19] found that high-tax countries are more likely to experience social tensions, as citizens may feel that they are being taxed unfairly or that they are not getting value for their tax dollars. This can lead to reduced public support for the tax system and create political challenges for policymakers.

In conclusion, progressive taxation has several disadvantages, including disincentives to hard work and investment, complexity, perceived unfairness, reduced competitiveness, decreased tax revenue, political instability, and social tensions. These factors must be considered when deciding on the best tax system for a country, and policymakers must find ways to balance the goals of reducing income inequality and funding public goods and services with the realities of the tax system.

Optimization according to the criterion of efficiency consists in minimizing the excess tax burden, while optimization according to the opposite criterion of fairness involves meeting the requirements of horizontal and vertical equality. If the optimization of taxation took place only according to the criterion of efficiency, then to the greatest extent optimal taxation would correspond to a proportional tax on the incomes of citizens. The question of whether a proportional or a progressive tax meets the criterion of justice to a greater extent is debatable in the financial literature due to the significant difference of opinion on ways to ensure vertical equality in taxation.

In any case, Candidate of Economic Sciences Raynova L. B. [9] mentioned that the implementation of this principle involves reasonable differentiation in the taxation of incomes of persons who have different opportunities to pay taxes. However, first of all, the choice between a proportional or progressive tax on the income of citizens from the standpoint of social justice is determined by what inequality in the distribution of

income is permissible in a particular society and what degree of redistribution of income it considers to be fair.

Therefore, the improvement of the personal income tax should be based on a comprehensive approach that combines both the interests of the state in increasing budget revenues and the interests of businesses and individuals in increasing personal incomes and ensuring a growing level of consumption.

III. OBJECT, SUBJECT, AND METHODS OF RESEARCH

The *object* of the research is a personal income tax.

The *subject* of the research is the impact of a progressive personal income tax on the income inequality in Ukraine. The study will focus on the modeling of a progressive tax rates based on Switzerland's tax schedule and a correlation between progressive taxation and income inequality in Ukraine. The research will include an analysis of relevant data and information to evaluate the effectiveness of the progressive taxation system in reducing income inequality in the country.

There are several *methods* that will be used to research the impact of the implementation of progressive taxation on income inequality in Ukraine:

- Secondary data analysis: This involves analyzing existing data and studies related to the topic. Data sources include government reports, academic journals, dissertation works, and news articles.
- Econometric analysis: This involves using statistical techniques to analyze the relationship between progressive taxation and income inequality, especially the Gini coefficient. Data sources include tax records, income data, and other relevant data.
- Comparative analysis: This involves comparing the relevant flat rate at 18% of Ukraine with modeling progressive tax rates, to identify similarities and differences and to assess the impact on income inequality.
- Case studies: Case studies will be used to examine the experiences of Switzerland that have implemented progressive taxation, with a focus on the impact on income inequality.

IV. RESULTS

2.1. Progressive income tax schedule

The federal tax rate on income in Switzerland is a progressive tax, meaning that the tax rate increases as income increases. The tax rate is determined based on the individual's taxable income and wealth. The federal tax rate on income in Switzerland is calculated based on a series of tax brackets, with each bracket taxed at a different rate.

Speaking in more detail, Switzerland's progressive income tax schedule, it is based on the following general principles:

- Taxable income is divided into several brackets and each bracket is taxed at a different rate.
- Taxable income that falls within a bracket is taxed at the corresponding rate, while income that exceeds a bracket is taxed at the next highest rate.

Table 1. Personal income tax rates of the direct federal tax rate on income in Switzerland (for single taxpayers) for 2023

Taxable income (CHF*)		Rate (%)
Over	Not over	
0,00	14 800,00	-
14 801,00	32 200,00	0,77
32 201,00	42 200,00	0,88
42 201,00	56 200,00	2,64
56 201,00	73 900,00	2,97
73 901,00	79 200,00	5,94
79 201,00	105 500,00	6,60
105 501,00	137 200,00	8,80
137 201,00	179 400,00	11,00
179 401,00	769 700,00	11,20
769 701,00		11,50

* For taxable income above CHF 769 700 the overall tax rate will be 11.5%.

In order to transfer a series of tax brackets of Switzerland into Ukraine, such actions were done:

- 1) Researched that the amount of minimum wage in Ukraine at the end of 2022 was 6700 UAH [29]
- 2) Researched that the amount of minimum wage in Switzerland at the end of 2022 was 4030,40 CHF or 159457,13 UAH (the NBU exchange rate was 39,5636 UAH per 1 CHF, dated 31.12.2022) [28, 30]
- 3) Calculated the minimum wage in Switzerland was 23,8 times larger than the minimum wage in Ukraine.
- 4) The ratio of Ukrainian and Swiss minimum wages was found, namely the series of tax brackets should be multiplied by 0,042.
- 5) Finally, each series of tax brackets in Switzerland were multiplied by 0,042 and by 39,5636 (the NBU exchange rate per 1 CHF, dated 31.12.2022).

Table 2. Series of tax brackets of Personal income tax rates in Ukraine (for single taxpayers)

Taxable income (UAH*)		Rate (%)
Over	Not over	
0,00	24 603,02	0
24 604,02	53 528,19	0,77
53 529,19	70 151,85	0,88
70 152,85	93 424,97	2,64
93 425,97	122 848,85	2,97
122 849,85	131 659,39	5,94
131 660,39	175 379,61	6,60
175 380,61	228 076,62	8,80
228 077,62	298 228,46	11,00
298 229,46	1 279 523,12	11,20
1 279 524,12		11,50

* For taxable income above 1 279 524,12 UAH the overall tax rate will be 11.5%.

2.1. Comparative analysis using the Gini coefficient

In order to compare under which type of tax income inequality will be less, Gini coefficients for both flat and progressive taxation were calculated.

The Gini coefficient, also known as the Gini index, is the statistical measure used to measure the income distribution among the country's population, i.e., it helps measure the income inequality of the country's population.

It is a value between 0 and 1. A higher number indicates a greater degree of income inequality. A value of 1 indicates the highest degree of income inequality, where a single individual earns the country's entire income. A value of 0 indicates that all individuals have the same income. Thus, a value of 0 indicates perfect income equality. One of the Gini index's limitations is that it requires that no one has negative net wealth.

In order to calculate the Gini coefficient, the following actions were taken: based on Table 3, it was assumed that each person per year earns at the figure that is the lowest limit in each distribution. These numbers were then grouped according to the progressive tax scale that was constructed earlier.

Table 3. Distribution of the population by average per capita equivalent total income

Distribution of the population (%)	Distribution of the population (%) by average per capita equivalent total income per year, UAH
4,5	below 60000
17,7	60000-84000
27	84000-156000
24,3	156000-276000
8,5	276000-324000
18	over 324000

* Compiled by the author based on [26]

In order to calculate which share of the population receives which share of income, the population size as of 12/31/2021 [27] was taken and multiplied by the corresponding percentages by a group.

Table 4. Figures for calculating the Gini coefficient based on the flat taxation

Population, people	Share of population, %	Pre-tax income, million UAH*	PIT rate, %	After-tax income, million UAH	Share of income, %
1852529	4,50	0,00	18	0,00	0,00
11115171	27,0	933674,36	18	765612,98	14,82
7286612	17,70	437196,73	18	358501,32	6,94
10003654	24,30	1560570,01	18	1279667,41	24,78
7410114	18,00	2400876,94	18	1968719,09	38,12
3499221	8,50	965784,86	18	791943,58	15,33

* Pre-tax income per year

Table 5. Figures for calculating the Gini coefficient based on the progressive taxation

Population	Share of population, %	Pre-tax Income, million UAH	PIT rate, %	After-tax income, million UAH	Share of income, %
1852529	4,5	0,00	0	0,00	0,00
11115171	27	933674,36	0,77	926485,07	15,16
7286612	17,7	437196,73	0,88	433349,39	7,09
10003654	24,3	1560570,01	2,64	1519370,96	24,86
7410114	18	2400876,94	2,97	2329570,89	38,12
3499221	8,5	965784,86	6,60	902043,06	14,76

* Pre-tax income per year

It is important to note that all the rows were organized from the poorest to the richest. For instance, it was calculated that the bottom 8,5% of the population earns 15,3% of income, 17,7% of the population earns 6,9% of income, 24,3% of the population earns 24,8% of income, and 27% of the population earns 14,8% of income, etc.

Next, the first row from the ‘% of Population that is richer’ column was filled. Then, all the figures were added (from 0,069 to 0,381), the rows in ‘Fraction of population’ below it. Hence, we get 0.955. After that, to fill the second row in the ‘% of Population that is richer’ column, figures from the third to last rows were summed up. All the next rows were calculated in the same algorithm.

In order to fill the ‘Score’ column, the following formula was used:

$$Score = Fraction\ of\ Income * (Fraction\ of\ Population + 2 * \%\ of\ Population\ that\ is\ richer).$$

For instance, the score for the 2nd row is $0,069 * (0,177 + 2 * 0,778) = 0,120$; the score for the 3rd row is $0,148 * (0,27 + 2 * 0,508) = 0,191$ and so on. After that, all the terms in the ‘Score’ column were added.

Finally, for calculating the Gini coefficient, such formula was used:

$$Gini = 1 - Sum$$

So, for a flat tax rate of 18% Gini coefficient is 0,328 (1 - 0,672).

Table 6. Figures for calculating the Gini coefficient based on the flat taxation

Fraction of population	Fraction of income	% of the population that richer	Score
0,045	0,000	0,955	0,000
0,177	0,069	0,778	0,120
0,270	0,148	0,508	0,191
0,085	0,153	0,423	0,143
0,243	0,248	0,180	0,149
0,180	0,381	0	0,069
1	1	Sum	0,672

As with the previous type of tax rate, all the rows were organized from the poorest to the richest. For instance, it was calculated that the bottom 8,5% of the population earns 14,8% of income, 18% of the population earns 38,1% of income, 24,3% of the population earns 24,9% of income, and 27% of the population earns 15,2% of income, etc.

Next, the first row from the ‘% of Population that is richer’ column was filled. Then, all the figures were added (from 0,071 to 0,381), the rows in ‘Fraction of population’ below it. Hence, we get 0.955. After that, to fill the second row in the ‘% of Population that is richer’ column, figures from the third to last rows were summed up. All the next rows were calculated in the same algorithm.

In order to fill the ‘Score’ column, the following formula was used:

$$\text{Score} = \text{Fraction of Income} * (\text{Fraction of Population} + 2 * \% \text{ of Population that is richer}).$$

For instance, the score for the 2nd row is $0,071 * (0,177 + 2 * 0,778) = 0,123$; the score for the 3rd row is $0,148 * (0,085 + 2 * 0,693) = 0,217$ and so on. After that, all the terms in the ‘Score’ column were added.

Finally, for calculating the Gini coefficient, such formula was used:

$$\text{Gini} = 1 - \text{Sum}$$

So, for a progressive tax schedule that was built earlier, the Gini coefficient is 0,272 (1 - 0,728).

Table 7. Figures for calculating the Gini coefficient based on the progressive taxation

Fraction of population	Fraction of income	% of the population that richer	Score
0,045	0,000	0,955	0,000
0,177	0,071	0,778	0,123
0,085	0,148	0,693	0,217
0,270	0,152	0,423	0,169
0,243	0,249	0,180	0,150
0,180	0,381	0	0,069
1	1	Sum	0,728

To sum up, the Gini coefficient at progressive taxation is 0,272, and at flat taxation is 0,328. Since the smaller the coefficient, the smaller the income inequality, it can be argued that income inequality will be smaller with a progressive personal income tax rate. In other words, if such a system with progressive personal income tax rates based on Switzerland’s progressive tax schedule is implemented in Ukraine, it will help to reduce income inequality.

V. CONCLUSIONS

In conclusion, the research has aimed to evaluate the impact of the implementation of progressive taxation on income inequality in Ukraine. Through a thorough analysis of available data and literature, the study found that progressive taxation has the potential to effectively address income inequality in Ukraine, if properly implemented and accompanied by complementary policies and reforms. Nevertheless, it is also important to note that some challenges, such as tax evasion, corruption, and limited administrative capacity, need to be addressed for the progressive taxation system to achieve its intended goals.

It is recommended that the Ukrainian government continues to monitor and evaluate the implementation of progressive taxation and make adjustments as needed, while also investing in strengthening its tax administration and addressing the root causes of income inequality in the country. Overall, the research highlights the importance of progressive taxation in reducing income inequality and contributing to more equitable and sustainable economic growth.

Of course, the introduction of a progressive scale containing rates significantly lower than the current tax rate requires an analysis of changes in its fiscal role. In this direction, we will continue our research on this topic.

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