"Relationship between income inequality, social transfers, poverty, and employment in Ukraine"

| AUTHORS | Pavlo Kerimov (iD) Yuliia Shapoval (iD) (R) |

NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
36	1	4

© Pavlo Kerimov, Yuliia Shapoval, 2024

Pavlo Kerimov, Ph.D. in Economics, Scientific Fellow, Department of Public Finance, Institute for Economics and Forecasting, National Academy of Sciences of Ukraine, Ukraine.

Yuliia Shapoval, Ph.D. in Economics, Senior Scientific Fellow, Department of Monetary Relations, Institute for Economics and Forecasting, National Academy of Sciences of Ukraine, Ukraine. (Corresponding author)

Pavlo Kerimov (Ukraine), Yuliia Shapoval (Ukraine)

RELATIONSHIP BETWEEN INCOME INEQUALITY, SOCIAL TRANSFERS, POVERTY, AND EMPLOYMENT IN UKRAINE

Abstract

The impact of social transfers on income inequality and poverty remains a subject of debate, particularly regarding threshold effects, design, and integration with taxation and labor market dynamics. Using a linear regression model, the study analyzes the dependency of the Gini index on the percentage of social transfers in the average household's monthly resources, the percentage of households with income below the median, and the percentage of the employed populace in Ukraine from 2010 to 2021. The results show that a 1% increase in social transfers in household income reduces income inequality by 0.13%, a 1% increase in employment decreases income inequality by 0.1%, whereas a 1% rise in poverty leads to a 0.34% increase in income inequality. In line with the results from EU and OECD countries, this study confirms that increasing the share of social transfers in household incomes contributes to the mitigation of income inequality in Ukraine. However, this remains valid only if the share of social transfers in households' total income rises proportionally. The income and expenditure patterns of Ukrainian households, along with the Gini index, reflect poverty, which is partially mitigated by social transfers; however, their effectiveness is constrained by offsetting inflation. The rise in household income without a corresponding reduction in poverty suggests that employment is no longer the predominant factor in poverty alleviation in Ukraine.

Keywords	fiscal policy, income inequality, social spending, poverty, employment, redistribution, Gini index, regression analysis
JEL Classification	D31, D63, E25, H55

INTRODUCTION

The enduring challenges of inequality and poverty significantly impede economic growth. In Ukraine, these issues are further aggravated by economic crises and demographic shifts, particularly with the outbreak of the ongoing war. Social transfers are theoretically designed to narrow the income gap, but the practical outcomes are less straightforward. Despite extensive public social spending, inequality and poverty remain pervasive in Ukraine, raising issues about the actual effectiveness of social transfer programs. The primary means by which social transfers affect income inequality is through direct redistribution. Social transfers raise the income levels of lower-income households, thereby reducing the income gap between the wealthiest and the poorest and stabilizing household consumption, especially in times of economic downturns. The effectiveness of public spending, namely social transfers, depends greatly on the tax base, accurate targeting, and the presence of administrative resources to ensure that the transfers reach their intended beneficiaries and are utilized for their specified purposes. Understanding the distributional impact of social transfers can facilitate shaping policy not only to alleviate poverty but also to shift more fairly income across the populace.

1. LITERATURE REVIEW

The welfare literature explores the relationship between social transfers and income inequality, emphasizing that societies with more extensive social protection systems tend to exhibit greater equality. The ongoing debate centers around the effectiveness of social welfare programs in alleviating inequality and poverty, their significance during economic downturns, their interaction with demographic and social factors, and other fiscal instruments.

This study builds upon previous quantitative research indicating the positive influence of social transfers on addressing poverty and inequality. Prasad (2008) provided foundational evidence by demonstrating that economies with higher social transfers tend to exhibit lower income inequality. That study revealed an inverse relationship between social transfer expenditure and inequality in 2007, where the United States, with limited social transfer spending, experienced higher inequality, while European nations such as Austria, Belgium, Denmark, France, Germany, and Sweden, which allocated substantial resources to social transfers, observed relatively diminished income inequality.

Social transfers decrease poverty rates, particularly in countries with substantial social spending. Expanding on this, Miežienė and Krutulienė (2019) confirmed the role of social protection transfers in decreasing the percentage of individuals at risk of poverty across the EU during 2008–2016, with countries exhibiting higher social spending showing more significant poverty reduction effects. Similarly, Antošová and Stávková (2019) emphasized the impact of social transfers, noting that countries with a higher proportion of social benefits in household income, such as Sweden, Ireland, Finland, Belgium, and Denmark, achieved a more substantial reduction in poverty in 2015. Additionally, the strategy of allocating a high percentage of social benefits along with a low percentage of old-age pensions has been proven to be more effective in addressing poverty. In parallel, Verberi and Yaşar (2021) highlighted that increased social spending across 30 OECD countries in 2009, 2011, and 2015 correlated with a reduction in income inequality, reaffirming the redistributive potential of social transfers.

The extent to which social transfers should be intensified remains a contentious issue. Sidek (2021), based on 122 countries, indicates that an initial increase in government spending in advanced economies may lead to heightened income inequality. However, once a certain threshold is surpassed, this expenditure reduces inequality. Meanwhile, in developing nations, investments in education and development play a critical role in decreasing income inequality. This highlights the complexity of how social transfers impact inequality depending on broader economic conditions.

While traditional theory firmly holds that income inequality determines social sector expenditure, circumstances can change. Longford and Nicodemo (2010), analyzing the effectiveness of social transfers in reducing poverty across EU countries in 2007, found that northern and western European countries were more effective in reducing poverty compared to southern countries and former Soviet republics. In addition, central European countries had similar effectiveness to Scandinavian countries but with lower potential for poverty reduction. Focusing on countries' cases, Mihaylova and Bratoeva-Manoleva (2017) revealed that social transfers reduced income inequality in Bulgaria from 2000–2014. In particular, pensions had a substantial impact on reducing inequality due to their increasing share in total income, while family allowances, primarily for lower-income groups, had a weaker overall impact due to their smaller share in recipients' total income. Likewise, Kozuharov and Petkovski (2018) demonstrated that in Macedonia, higher social transfer expenditures as a percentage of GDP, aimed at vulnerable groups, were associated with reduced income inequality (Gini index), while lower social transfers were linked to increased inequality during 2002–2014.

The demographic composition of a country influences the effectiveness of social transfers. Esping-Andersen and Myles (2011) underscored the influence of a society's demographics and social composition on income inequality, poverty, and governmental actions. Leth-Petersen and Sæverud (2024), examining Denmark from 1987 to 2021, noted that despite a decrease in the marginal tax rate on earned income and a reduction in social assistance, household disposable income inequal-

ity had risen since 2009. This trend aligned with a notable influx of immigrants from non-Western and Eastern European nations who heavily depended on social transfers. Alongside, Murshed et al. (2017) highlight that fiscal capacity and the level of democracy have significant impacts on social protection spending. However, issues like bureaucratic inefficiency, often exacerbated by corruption, can result in hidden incomes and explain the lack of positive effects of social transfers on economic inequality. D'Agostino et al. (2020) pointed out that social transfers reduced inequality in OECD countries over 1980–2015, but their effectiveness varied based on each country's electoral system and government coalition dynamics.

The distributional effects of social transfers compared to taxes, are also crucial. Although social transfers typically support those with lower incomes, higher-income individuals usually pay a larger share of their tax earnings (Luebker, 2011). Wildowicz-Szumarska (2022) argued that social transfers demonstrated greater effectiveness in addressing income inequality across 28 EU countries from 2005 to 2017 than direct taxes. This is attributed to the disproportionate allocation of tax allowances to wealthier individuals, resulting in reduced progressivity of personal income tax, which impedes the attainment of redistributive goals in conjunction with the reduction of top tax rates. The relationship between direct redistribution and inequality is influenced by the dynamics of poverty. As the poor population consumes regulated goods more intensively than the rest of the population, poverty encourages the need for redistribution through regulation, while inequality steers the redistribution toward social spending (Costas-Fernández & Lodato, 2022).

The combination of social transfers with other redistributive policies is particularly effective in mitigating inequality and poverty. For instance, Sakamoto (2021) examined OECD countries, highlighting that active labor market policy spending positively impacted the skill levels of lower-income workers. This study illustrates how social transfers, when combined with labor market policies, can reduce income disparities. Malone (2021), focusing on Ireland, demonstrated how a progressive tax structure coupled with redistributive social transfers effectively bal-

anced out income inequalities during 2012–2019. According to Wroński (2023), public pensions in the EU were found to reduce wealth inequality by approximately 30% as of 2019, emphasizing the direct impact of pension systems as a form of social transfer in narrowing the wealth gap. Findings from the case of Brazil (Ibarra et al., 2023) show that direct transfers primarily benefit the lowest income groups before taxes. The fiscal system in 2019 had a more pronounced effect in reducing poverty among households with elderly individuals, while households with children experienced a comparatively smaller decline in poverty. This highlights the uneven impact of social transfers on different demographic groups (by household type) and their varied influence on income inequality. In-kind benefits also have the potential to mitigate inequality. According to Giangregorio (2024), although in-kind benefits had a limited effect on inequality in 15 EU countries between 2008 and 2017, they contributed to reducing Gini indexes. This suggests that non-monetary social transfers can play a role in reducing income inequality.

The extent to which transfers reduce income inequality varies based on their design. The impact of social transfers depends on how well they reach the most vulnerable groups and provide sufficient benefits rather than just on the overall amount of spending (Amaglobeli & Thevenot, 2022). Joumard et al. (2012) emphasized that the extent to which taxes and transfers reduce inequality depends on their size, composition, and progressivity. They noted that certain OECD countries with smaller tax and welfare systems achieved similar levels of income redistribution to those with larger social transfer programs in 2000–2009. Szczepaniak's (2020) analysis of 25 EU countries during 2005–2017 showed that social protection expenditures had a significant positive impact on reducing the Gini gap, in contrast to other types of social expenditures.

During economic downturns, increased social spending can mitigate the adverse effects of crises on income inequality and poverty. Cyrek (2019) demonstrated that the level of social spending in OECD countries varied over time, declining during economic growth and rising during financial crises, leading to substantial changes in spending patterns. However, on the whole, there is no con-

sensus regarding the direct effect of social spending in mitigating the adverse impacts of economic crises, as each nation's decisions and outcomes are context-specific. Cyrek (2019) identified no direct correlation between the efficacy of social policies in poverty reduction and the amelioration of social inequality in the EU countries over 2007–2016, suggesting that these policies necessitate distinct priorities. It is pointed out that there exist at least two models of state social assistance: one that emphasizes poverty reduction (exemplified by Scandinavian countries) and the other, focused on alleviating income inequality (observed in Mediterranean countries and new EU members such as Poland, Latvia, and Lithuania). This highlights that the design of social transfers can vary significantly in their impact on inequality.

Efficiency in targeting and budget size is essential for reducing income inequality, as evidenced by the research of 15 countries from 1982 to 2013 (Caminada et al., 2019). The performance of social transfers can be measured by their coverage, targeting accuracy, generosity, progressivity index, impact on poverty and inequality, undercoverage, and leakage (Sulla et al., 2017). As per the findings of Cammeraat (2020), diverse types of social expenditure within the EU from 1990 to 2015 influenced the poverty rate, Gini, and GDP growth. The study indicated a lack of statistically significant negative correlation between any form of social spending and GDP growth and that the most efficacious type of social spending in reducing poverty is positively associated with economic growth. Income inequality exhibited the most considerable negative correlation with expenditure types designed for a broader demographic group than just people with low incomes, implying that inclusive social transfer programs have a stronger impact on inequality tackling. Granger et al. (2022) underline the efficiency of properly targeted social transfers in terms of public spending to outcomes, despite the complexity of administration and the potential for creating negative economic incentives. While universal social transfers can also be effective, they rely on a broad tax base. Most countries use a combination of these approaches based on their specific goals, budgets, and administrative capabilities. Luebker (2021) points out that relative earnings differentials are not a valid indicator of income inequality struc-

ture, and there is no evidence that income distribution skew is positively linked to fiscal redistribution. Therefore, while social transfers play a crucial role in reducing inequality, their design and implementation are key to their effectiveness.

Lastly, studies specific to Ukraine underscore the mixed effectiveness of social transfers. Cherenko (2011) revealed that certain social transfer programs (financial assistance for children and targeted support for low-income families) positively impacted the distribution of households in 2010. Meanwhile, contributions to social inequality in the form of pensions are not so equal to their role in the income structure, while contributions of social benefits to inequality outweigh their role in the formed income of the population. Consequently, affluent individuals were the primary beneficiaries of these social transfers (Cherenko, 2011). The Ukrainian populace consistently depends on social transfers as a substantial component of household income, which can be attributed to the country's political landscape and the expansive social programs implemented by the government (Kizyma, 2009). Sokolovska (2019) highlighted the pivotal role of the design of social transfers in influencing inequality, noting that they generally exhibit a more pronounced redistributive impact compared to taxes. Cherenko (2023) underscored that prior to the full-scale war, vulnerable segments of the population derived limited benefits from most social protection initiatives, with indicators reflecting suboptimal efficiency in coverage and targeting despite augmented funding. Perehudova (2022) stressed over-reliance on social transfers, cautioning that excessive transfers amidst the war might lead to dependency and transform social assistance into an unconditional basic income model.

Thus, social expenditures predominantly target the reduction of economic inequality, although their tangible impact often remains ambiguous. Empirical studies conducted across EU and OECD countries indicate that social transfer effectiveness largely relies on the availability of resources and their targeted allocation. While an extensive body of literature underscores the role of higher social transfers in diminishing

income inequality, recent analyses have high-lighted the significance of various factors such as demographic changes, fiscal capacity, and bureaucratic efficiency. As Ukraine contends with ongoing economic and social adversities, including those stemming from war, an in-depth analysis of the role of social transfers in addressing poverty and income inequality is critical for adjusting fiscal policy within the socioeconomic context.

Against this backdrop, the aim of this paper is to assess the nexus between income inequality and social transfers, poverty, and employment in Ukraine. To build on this objective, the study seeks to analyze whether income inequality (Gini index) is affected by social transfers (social transfers percentage in the average household's monthly resources), employment (percentage of employed population aged 15–70 in yearly average population), and poverty (poverty head-count ratio at societal poverty line also known as the percentage of populace with income below median income) using Ukrainian data from 2010–2021.

2. METHODS

2.1. Model specification

Applied linear regression is a standard procedure for gauging the dependencies between variables. Since none of the previous studies considered the connection between income inequality and social transfers to be non-linear, this study also skips the functional form determination step. Thus, a least squares linear regression with HAC standard errors is used to gauge the connection between income inequality, social transfers, poverty, and employment in Ukraine. The functional form of the model is expected to be as follows:

$$II = \beta_0 + \beta_1 ST + \beta_2 P + \beta_3 E + \varepsilon, \qquad (1)$$

where II is Income Inequality; β_0, β_1, β_2, β_3 are the coefficients measuring the effect of each independent variable; ST is Social Transfers; P is poverty, and E is employment; ε is unexplained variation. The analysis is to be performed via the "gretl" software package.

The hypotheses are formulated as follows:

H0: $\beta_0 = \beta_1 = \beta_2 = \beta_3 = 0$ (none of the independent variables affect income inequality).

H1:   At least one $\beta_i \neq 0$ (at least one independent variable affects income inequality).

2.2. Variable specification

2.2.1. Dependent variable

The Gini index is used as the dependent variable. It is taken from the World Bank's Poverty and Inequality Platform and the State Statistics Service of Ukraine – SSSU. The Gini index is chosen to represent income inequality since it is the most universal metric used in similar studies. Moreover, it is a ubiquitously calculated ratio, which means that:

a) as a ratio, it is inherently comparable across countries (i.e., it is not denominated in a particular currency, as are the direct indexes habitually used in country-specific studies such as average household income or consumer expenses);

b) since it is tracked by the World Bank and calculated by most countries' statistics services, the data on this ratio is readily available, unified, and transparent, minimizing the chance of it being erroneous.

2.2.2. Independent variables

The independent variables used in the model are the percentage of social transfers in the average household's monthly resources, the percentage of households with income below the median across the country, and the percentage of employed populace across the country. All of the indices used are ratios to prevent any data comparability issues.

The percentage of social transfers in the average household's monthly resources is calculated based on the aggregate resource structure (based on the selective examination of the household's living conditions) compiled by the US. It represents the influence of social transfers on an average household's income. It is likely to be a more precise rep-

resentation of such influence than the more standard percentage of social spending in the state budget index, for it presumably accounts for the number of social transfers that actually reached their recipients. These transfers include cash pensions, stipends, and social benefits, as well as noncash benefits and subsidies to pay for housing and communal utilities, electricity, fuel, healthcare goods and services, travel services, recreation, transportation, and communications services. This index was included in order to account for both household income and social transfers since two of these indices turned out to have a nearly linear correlation, which made their simultaneous inclusion into the model ill-advised.

The percentage of households with income below the median across the country is used to represent the influence of poverty since any social transfers exist to alleviate poverty, be it via reducing income inequality or compensating for historically accumulated wealth inequality. The index used is taken from the World Bank statistics, namely the poverty headcount ratio at the societal poverty line (% of the population). Even though the locally supplied data (i.e., the percentage of the populace below the living wage) were also available, these statistics provided no additional time periods, and thus, the more internationally recognized source was used.

The percentage of the employed population across the country is used to evaluate the influence of employment on income inequality in Ukraine. The index is calculated based on the data of the SSSU, namely "Employed populace by type of economic activity in 2012–2021 (KVED-2010)/NASE (rev.2)" table, appended with the data taken from "Employed populace by type of economic activity in 2000–2012 (KVED-2005)" table, and "Populace quantity and average populace quantity across the year" table for appropriate years by dividing the number of employed populaces by average yearly populace quantity.

3. RESULTS

The data cover the period from 2010 to 2021, as their availability constrains them (as of August 2024). The data on employment, poverty, and state social transfers, as well as the last data point of the income inequality time series, are taken from the SSSU. The rest of the income inequality time series is taken from the data provided by the World Bank. Table 1 provides an overview of the data sources.

All of the data used are denominated in percentage points to ensure the same bit depth for mutual comparability. There are 12 observations per variable available, which is enough to build a model, but its quality could be greatly improved by increasing the time scale up to at least 50 observations per variable. The average monthly income and average monthly expenses per household were not included in the model because both indices have a near-linear correlation with the monthly social transfers received per household. As the descriptive statistics show (Table 2), the income inequality and poverty data are largely uniform during 2010–2021, while data on social transfers and employment show a bit more variation.

Table 2. Descriptive statistics

Variable	Min	Maxm	Mean	Std. deviation
II	24.00	26.6	25.27	0.7667
ST	18.6	28.2	25.01	3.413
P	9.5	12.1	10.95	0.7394
E	37.88	44.48	40.46	2.519

Note: II is Income Inequality, ST is Social Transfers, P is poverty, and E is employment.

The correlation matrix (Table 3) shows that the strongest correlation is between the indicator of income inequality (Gini index) and the combined indicator of social transfers' percentage in monthly resources of households. This correlation is inversely proportionate and is quite strong at –0.7430. Preliminary testing also showed that the Gini index

Table 1. List of dependent variables

Characteristic	Indicator	Symbol	Source of data
Income inequality	GINI index, %	II	World Bank, SSSU
State social transfers	Percentage of social transfers in average household's monthly financial resources, %	ST	SSSU
Poverty	Percentage of households with income below median across the country, %	P	SSSU
Employment	Percentage of employed populace across the country, %	E	SSSU

had a strong positive correlation (0.718) with social transfers per month received by the households (denominated in UAH), a strong negative correlation (–0.742) with monthly income of households (denominated in UAH) and a strong positive correlation (0.747) with monthly spending of households (denominated in UAH). All three of these indicators had near linear correlation among them and thus caused harmful collinearity in the model. Therefore, only social transfers to households (divided by total household monthly income in order to ensure that it is denominated in %) were included in the model. Thus, according to the correlation matrix, an increase in the sum of received social transfers, household income, and expenses increases the Gini index, while the increase in the fraction of social transfers in total household income and an increase in employment decreases it. Since the higher values for the Gini index correspond to higher income inequality, the increase in the sum of social transfers, as well as in the sum of monthly household income and expenses, increase income inequality. In comparison, the increase in the fraction of social transfers in total household income, as well as the increase in employment, decreases it, which aligns with standard predictions.

Table 3. Correlation matrix for variables

Variable	II	ST	P	E
II	1	−0.7430	0.3669	−0.7072
ST	−	1	0.0422	0.5463
P	−	−	1	−0.1800
E	−	−	−	1

Note: II is Income Inequality, ST is Social Transfers, P is poverty, and E is employment.

Outputs of a basic linear model of dependency of income inequality (Gini index) on the percentage of state social transfers in monthly household income, poverty (fraction of populace with income lower than median income across the country), and employment (yearly average of constantly employed populace) with HAC standard errors are presented in Table 4.

Table 4. Regression outputs

Variable	coefficient	std. error	t-ratio	p-value
ST	−0.1291	0.0462	−2.792	0.0235*
P	0.3434	0.1102	3.114	0.0143*
E	−0.1015	0.0313	−3.238	0.0119*

*Note: * variable significant within 95% confidence interval. ST is Social Transfers, P is poverty, and E is employment.*

The equation for this regression can be transcribed as such:

$$II = -0.1291ST + 0.3434P \\ -0.1015E + 28.855. \tag{2}$$

According to the model, a 1% increase in fracture of social transfers in monthly household income decreases income inequality by 0.13%; a 1% increase in poverty increases income inequality by 0.34%; a 1% increase in employment decreases income inequality by 0.1%. The constant is rather high, however, and sets the default level of income inequality at 28.8%. All of the variables are significant within 95% confidence interval except for the constant, which is significant within 99% confidence interval. This rejects the null hypothesis that none of the independent variables affect income inequality.

The R^2 of this model is rather high for a social science-related model, and shows that at least 78.4% of the variation of the dependent variable (i.e., the Gini index) is explained by the variation of independent variables. Such a value, however, indicates at a likelihood of some important variables being missing.

Therefore, the alternative hypothesis that social spending, employment, and poverty affect income inequality holds. An increase in social spending and employment decreases income inequality, while an increase in poverty increases it.

While social transfers contribute to the reduction of income inequality, their influence is intricate and interconnected with broader economic circumstances and living standards in Ukraine. The Gini index was chosen to represent income inequality as it is universally used and widely accepted. The Gini index for Ukraine is quite low, and in 2021, Ukraine was in the top 5 worldwide by this metric. This placement, however, indicates the weakness of the Gini Index, for the neighboring countries in this rating are Moldova and Belarus, while more developed countries like Japan or the USA occupy 55th and 113th places, respectively. The reason for this is that income inequality alone does not correspond with accumulated wealth or living standards. Historically, Ukraine has always had a rather low Gini index, with the highest historical
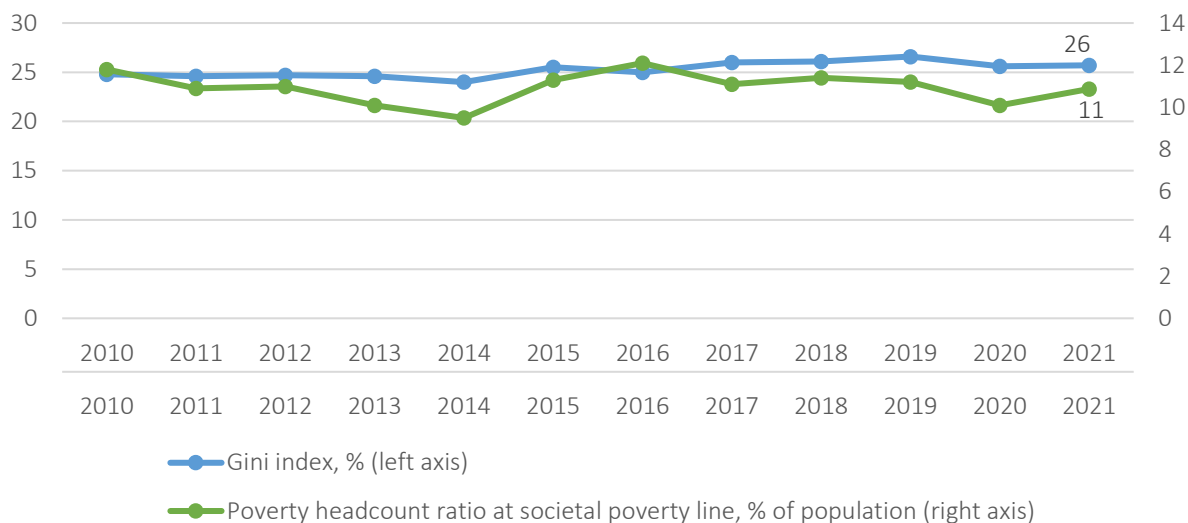
Figure. 1. Gini index and poverty ratio for Ukraine, 2010-2021

value being 0.39 in 1995, with a gradual decline to the 0.24-0.26 range captured during 2010–2021 (Figure 1). Under a general slight downward trend of employment, the Gini index declined from the mid-1990s until 2010, followed by a slight increase until 2019 (due to the effects of the national currency devaluation resulting from the GFC and the start of the war in 2014) and then a slight decrease again until 2021. When the Gini index increased, the poverty rate tended to follow a similar pattern, suggesting that higher inequality often coincides with increased poverty in Ukraine.

This equality in income shows even poverty, which is common for small economies with significant social fiscal components. In order to confirm this presumption, it is necessary to analyze the income and spending structure of households. While the aggregated resources (aggregate income from all possible sources, including help from relatives and subsistence farming) per household grew throughout the whole period, from 438 USD in 2010 to 523 USD in 2021, the growth was not linear and included a noticeable decline in 2013–2015. It is most likely the result of political destabilization culminating in the beginning of Russian aggression, which happened during that period.

Subsistence minimum and minimum wage both only increased from 2010–to 2021, but since 2017, minimum wage was set to be twice the subsistence minimum and thus grew faster, up to the point when, in 2021, the subsistence

minimum was 2,250 UAH (81.2 USD), while minimum wage – 6,042 UAH (218.1 USD). That being said, the percentage of actual wages during 2010–2021 was never higher than 50%, even though it was the biggest source by percentage. The second category was social transfers (which included pensions, scholarships, subsidies, and social payments), which accounted for roughly 25% of the total available monthly resources per household. Another 12.8% were accounted for by profits from self-employment (including profits from subsistence farming and selling self-grown harvest), and yet another 7.4% came from relatives.

Thus, in Ukraine, about a quarter of a household's total available monthly resources were social transfers and subsidies. It is a relatively low amount compared to the EU countries. For instance, according to Antošová and Stávková (2019), the average fraction of social transfers across the EU countries in 2018 was 31.6%, while the maximum fraction (Greece) was 40.9%. Ukraine appears to have a comparable fraction of social transfers in household income with Lithuania (25.32%), Latvia (24.82%), and Estonia (22.29%), which were 91st, 71st, and 45th on the list of income inequality by Gini index in 2021, respectively. It is worth noting that despite having the highest percentage of social transfers in household income, Greece only ranks 54th on the Gini index rating in 2021. Therefore, higher social spending does not automatically decrease income inequality.

The household spending structure in Ukraine from 2010 to 2021 also implies poverty. The most spending (49.5% on average during the entirety of the period reviewed) was centered on food and utility bills (11.2% on average during 2010–2021). And even though there was a tendency to decrease the fracture of resources spent on food (in 2021, for instance, it was 45.9%), it is still a rather high percentage, comparable to many other countries with below-average income like Cameroon (45.2%), Uzbekistan (46.4%), and Uganda (44.2%) (Our World in Data, 2024). In comparison, the fraction of household food spending in the US during 2021 was 6.7%, in Greece – 18.8%, and in Lithuania – 19.8%.

High food spending in Ukraine is coupled with relatively low savings; if to count the difference between the total household's monthly income and spending, using the data of the SSSU, on average in 2010–2021, a household could save around 14% of its income or 62 USD per month.

Thus, the income and spending structure of Ukrainian households in 2010–2021, along with the Gini index, shows even poverty, which is alleviated by social transfers, that amounts to a quarter of the total household's monthly income. This conclusion is further reinforced by the model outputs, that is, the decrease in income inequality is achieved by increasing the fraction of social transfers in the household's monthly income. However, the impact of the mentioned social transfers seems to be relatively low in magnitude and is only significant as long as it is a percentage increase. This is likely the result of a rather drastic increase in overall household income during 2010–2021, even though it stayed primarily unchanged in USD equivalent, and is likely to be severely diminished by inflation in real purchasing power.

As of August 2024, there are not newer comparable data on per-household earnings since the presented data are calculated by the SSSU on an unidentified set of households, i.e. are stylized. Thus, only a basic analysis can be performed for the beginning period of war. Based on the data from the Ministry of Finance of Ukraine (2024), social spending grew from 367 bln UAH (approximately 13.6 bln USD) in 2021 to 514 bln UAH (approximately 14 bln USD) in 2023. It is apparent that due to the devaluation

of the Ukrainian currency since the full-scale war, the real purchase power of the recipients of state aid mostly did not change or even decrease despite a rather significant increase (+40%) in social spending. A similar dynamic was seen in subsistence minimum, with it being increased from 2,393 UAH (74 USD) in 2022 to 2920 UAH (74.3 USD) in 2024 and minimal wage – from 6,500 UAH (201 USD) in 2022 to 8,000 UAH (203.6 USD) in 2024. The social spending alone, however, does not account for the loss of wage income and self-employment income, which has become commonplace due to war, nor does it account for an increase in wages for those categories of people who were receiving average or below-average wage before the full-scale war, but are now receiving an above average wage in the military. And while the increase in wealth inequality is likely to be massive regardless of state support due to the widespread destruction of property, income inequality might retain roughly the same levels. However, even with nominal income retention, Ukrainians' purchasing power steadily declines. Thus, the general conclusion of the model that the low Gini index in Ukraine shows equality in poverty, and it is mainly attributed to state social spending, still holds up.

4. DISCUSSION

The findings align with existing studies positing an interplay between social transfers and inequality. Following Cammeraat's approach (2020), which involved a regression model to examine the relationship between social expenditure and the final values of the poverty rate and Gini index, this study conducted an analysis of the dependency between income inequality and its most regular factors by using data on Ukraine during 2010–2021. The growth of fracture of social transfers in monthly household income was found to be significant in reducing income inequality in Ukraine, which is according to the findings of Prasad (2008), Longford and Nicodemo (2010), Mihaylova and Bratoeva-Manoleva (2017), Kozuharov and Petkovski (2018), Miežienė and Krutulienė (2019), Caminada et al. (2019), and Costas-Fernández and Lodato (2022).

In contrast to the conclusions drawn by prior researchers, this study found that poverty and employment appear to not affect income inequal-

ity, and an increase in the absolute sum of social transfers appears to not have an impact either. The latter seems to be a paradox, but it is mostly linked to the magnitude of such increases; during 2010–2021, the minimum wage increased 6.8 times, from 888 to 6,042, while its purchasing power, roughly estimated via USD equivalent, only grew by 19%, from 438 USD to 523 USD. In other words, the increase in household income mostly exists to compensate for the inflation and currency risks and predominantly allows for sustaining the same level of poverty year after year.

Since only half of the available monthly income of households comes from actual wages and social transfers are the second biggest source of income, their increase allows for equalizing household income only when it is big enough to affect the percentage structure of a household's income visibly. Otherwise, these transfers are barely registered, and a yearly increase of, say, pension, less than 100 UAH does not cover, for instance, loss of purchasing power due to inflation. Therefore, those who are dependent on social transfers are equally poor, and those, who are not, tend to receive their income from non-transparent sources, which do not find their way into being represented in official statistics.

While this study provides insights into the impact of social transfers, poverty and employment on income inequality in Ukraine, it is crucial to acknowledge its limitations. The R^2 of the model indicates that some of the factors are missing; finding such factors can be a topic for further research. One such likely factor would be inflation, but including it without any modifications appears to have worsened the model. There is also a factor of regional inequality, which is not shown on the state average levels; for instance, income for Kyiv and Kyiv Oblast is on average three and more times above country averages, which in turn makes "help from relatives" a significant enough source of income to be tracked separately. Another part of this income source was labor migration.

To sum up, the results from Ukraine's case show that increasing the proportion of social benefits in household income helps reduce income inequality, even though there is not a direct link between poverty and employment. Simultaneously, in light of fiscal discipline challenges, social transfers alone cannot be the sole solution to address economic inequality. This highlights the importance of targeted social transfers and brings attention to employment-related concerns.

CONCLUSION

This study underscores the role of social transfers in mitigating income inequality in Ukraine. Regression analysis during 2010–2021 reveals that a 1% increase in social transfers as a proportion of monthly household income corresponds to a 0.13% reduction in income inequality. Although this finding aligns with economic theory, demonstrating that social transfers redistribute income to lower-income households, the reduction of 0.13% in income inequality might seem modest and could vary depending on the targeting and scale of the transfers. The findings also show that a 1% increase in poverty leads to a 0.34% elevation in income inequality, whereas a 1% increase in employment is associated with a 0.1% decrease in income inequality, indicating that just employment growth may not be sufficient to significantly reduce income inequality.

Meanwhile, wages constitute only half of the monthly household income, with social transfers being the second most significant income source. Non-wage income tends to be not from self-employment, however, since it is the fourth-most source of income, after wages, social transfers, and aid from relatives. This suggests either an entrepreneurship-averse mindset among the Ukrainian populace or effective masking of self-employment income for tax evasion. The percentage of transfers appears to have declined slowly as the overall volume of monthly resources available to households increased during 2010–2021, pointing to potential challenges with expanding social transfer volume due to resource constraints. This underscores the need for better-targeted social transfers to reduce inequality effectively. Overall, the income and spending structure of Ukrainian households, along with the Gini index, indicate persistent poverty that is, to some extent, alleviated by social transfers. Despite an increase in so-

cial spending since the onset of the full-scale war, Ukrainians' purchasing power has decreased due to currency devaluation. On the whole, the rise in household income largely aims to counterbalance the effects of inflation.

Future research should incorporate additional variables influencing income inequality, such as regional disparities and inflation effects, to develop more effective fiscal policies for tackling poverty and inequality in Ukraine.

AUTHOR CONTRIBUTIONS

Conceptualization: Yuliia Shapoval.
Data curation: Pavlo Kerimov.
Formal analysis: Yuliia Shapoval.
Investigation: Pavlo Kerimov, Yuliia Shapoval.
Methodology: Pavlo Kerimov.
Project administration: Yuliia Shapoval.
Resources: Pavlo Kerimov.
Software: Pavlo Kerimov.
Supervision: Yuliia Shapoval.
Visualization: Pavlo Kerimov.
Writing – original draft: Pavlo Kerimov, Yuliia Shapoval.
Writing – review & editing: Yuliia Shapoval.

ACKNOWLEDGMENT

REFERENCES

1. Amaglobeli, D., & Thevenot, C. (2022). Tackling inequality on all fronts. *Finance & Development Magazine, 59*(001), 54-57. Retrieved from https://www.imf.org/en/Publications/fandd/issues/2022/03/Tackling-inequality-on-all-fronts-Amaglobeli-Thevenot

2. Antošová, I., & Stávková, J. (2019). Application of the institute of income redistribution in the form of social transfers in EU countries. *DANUBE, 10*(2), 161-172. https://doi.org/10.2478/danb-2019-0008

3. Caminada, K., Goudswaard, K., Wang, C., & Wang, J. (2019). Has the redistributive effect of social transfers and taxes changed over time across countries? *International Social Security Review, 72*(1), 3-31. https://doi.org/10.1111/issr.12193

4. Cammeraat, E. (2020). The relationship between different social expenditure schemes and poverty, inequality and economic growth. *International Social Security Review, 73*(2), 101-123. https://doi.org/10.1111/issr.12236

5. Cherenko, L. (2023). Targeting of social programs at vulnerable groups: Sustainable trends and post-war prospects. *Demography and Social Economy, 51*(1), 73-95. (In Ukrainian). https://doi.org/10.15407/dse2023.01.073

6. Cherenko, L. M. (2011). The estimation of the influence of the state social support upon the inequality and poverty. *Demography and Social Economy, 2*(16), 118-127. (In Ukrainian). https://doi.org/10.15407/dse2011.02

7. Costas-Fernández, J., & Lodato, S. (2022). Inequality, poverty and the composition of redistribution. *Social Choice and Welfare, 59*(4), 925-967. https://doi.org/10.1007/s00355-022-01415-5

8. Cyrek, M. (2019). Government social spending in the EU countries: Efficiency in poverty and income inequality reduction. *Equilibrium. Quarterly Journal of Economics and Economic Policy, 14*(3), 405-424. https://doi.org/10.24136/eq.2019.019

9. d'Agostino, G., Pieroni, L., & Scarlato, M. (2020). Social transfers and income inequality in OECD countries. *Structural Change and*

Economic Dynamics, 52, 313-327. https://doi.org/10.1016/j.strueco.2019.11.004

10. Esping-Andersen, G., & Myles, J. (2011). Economic inequality and the welfare state. In B. Nolan, W. Salverda, & T. M. Smeeding (Eds.), *The Oxford Handbook of Economic Inequality* (pp. 639-664). Oxford Academic. https://doi.org/10.1093/oxfordhb/9780199606061.013.0025

11. Giangregorio, L. (2024). Welfare type and income inequality: An income source decomposition including in-kind benefits and cash-transfers entitlement. *International Tax and Public Finance, 31*(2), 367-403. https://doi.org/10.1007/s10797-022-09772-8

12. Granger, H., Abramovsky, L., & Pudussery, J. (2022). *Fiscal policy and income inequality: The role of taxes and social spending* (ODI Report). London: ODI. Retrieved from https://media.odi.org/documents/ODI_Report_Fiscal_policy_and_income_inequality_the_role_of_taxes_and_social_sp_GwknCLd.pdf

13. Ibarra, G. L., Cabrera, M., Conceição, O., & Vale, R. C. (2023). *Poverty and inequality implications of fiscal policies: The case of Brazil* (World Bank Working Paper No. 10495). Retrieved from http://documents.worldbank.org/curated/en/099423406222337139/pdf/IDU07d8faca60e1940410d-093030b2726e376e29.pdf

14. Joumard, I., Pisu, M., & Bloch, D. (2012). Tackling income inequality: The role of taxes and transfers. *OECD Journal: Economic Studies, 2012*(1). https://doi.org/10.1787/eco_studies-2012-5k95xd6l65lt

15. Kizyma, T. O. (2009). Sotsialni transfery yak dzherelo dokhodiv domashnikh hospodarstv: Problemno-teoretychni aspekty [Social transfers as a source of household income: Problem-theoretical aspects]. *Ekonomika ta Derzhava, 4,* 46-49. (In Ukrainian). Retrieved from http://www.economy.in.ua/pdf/4_2009/14.pdf

16. Kozuharov, S., & Petkovski, V. (2018). The impact of social transfers on inequality measured by GINI index: The example of Macedonia. *UTMS Journal of Economics, 9*(1), 49-61. Retrieved from https://hdl.handle.net/10419/195324

17. Leth-Petersen, S., & Sæverud, J. (2024). Inequality in Denmark, 1987–2021. *Fiscal Studies, 45*(2), 173-185. https://doi.org/10.1111/1475-5890.12365

18. Longford, N. T., & Nicodemo, C. (2010). *The contribution of social transfers to the reduction of poverty* (IZA Discussion Paper No. 5223). http://dx.doi.org/10.2139/ssrn.1690041

19. Luebker, M. (2011). *The impact of taxes and transfers on inequality* (International Labour Office Policy Brief No. 4). Retrieved July 25, 2024 from https://www.ilo.org/publications/impact-taxes-and-transfers-inequality

20. Luebker, M. (2021). Can the structure of inequality explain fiscal redistribution? Revisiting the social affinity hypothesis. *Socio-Economic Review, 19*(2), 735-763. https://doi.org/10.1093/ser/mwz005

21. Malone, P. (2021). *Income distribution and the impact of social transfers.* UCD Geary Institute for Public Policy. Retrieved from https://publicpolicy.ie/downloads/papers/2021/Income_Distribution_and_the_Impact_of_Social_Transfers_updated.pdf

22. Miežienė, R., & Krutulienė, S. (2019). The impact of social transfers on poverty reduction in EU countries. *Baltic Journal of European Studies, 9*(1), 157-175. https://doi.org/10.1515/bjes-2019-0009

23. Mihaylova, S., & Bratoeva-Manoleva, S. (2017). Social transfers and income inequality in Bulgaria. *South East European Journal of Economics and Business, 12*(1), 38-49. https://doi.org/10.1515/jeb-2017-0003

24. Ministry of Finance of Ukraine. (2024). *Open budget.* (In Ukrainian). Retrieved from https://openbudget.gov.ua/

25. Murshed, S. M., Badiuzzaman, M., & Pulok, M. H. (2017). *Fiscal capacity and social protection expenditure in developing nations* (UNU-WIDER Working Paper No. 2017/60). https://doi.org/10.35188/UNU-WIDER/2017/284-7

26. Our World in Data. (2023). *Share of expenditure spent on food vs. total consumer expenditure, 2022.* USDA Economic Research Service (ERS). Retrieved from https://ourworldindata.org/grapher/food-expenditure-share-gdp

27. Perehudova, T. (2022). Sotsialni transferty: Obumovlenist zainyatistiu u voiennii ekonomitsi Ukrainy [Social transfers: Conditionality of employment in the military economy of Ukraine]. *Strategy of Economic Development of Ukraine,* 50, 56-70. (In Ukrainian). https://doi.org/10.33111/sedu.2022.50.056.070

28. Prasad, N. (2008). *Policies for redistribution: The use of taxes and social transfers* (Discussion Paper DP/194/2008). International Institute for Labour Studies. Retrieved from https://researchrepository.ilo.org/esploro/outputs/995326519102676

29. Sakamoto, T. (2021). Do social investment policies reduce income inequality? An analysis of industrial countries. *Journal of European Social Policy, 31*(4), 440-456. https://doi.org/10.1177/09589287211018146

30. Sidek, N. Z. M. (2021). Do government expenditure reduce income inequality: Evidence from developing and developed countries. *Studies in Economics and Finance, 38*(2), 447-503. https://doi.org/10.1108/SEF-09-2020-0393

31. Sokolovska, A. (2019). Nerivnist dokhodiv i bahatstva ta podatkovi instrumenty yii zmenshennia [Income and wealth inequality and tax instruments of its decrease]. *Finance of Ukraine, 6,* 23-41. (In Ukrainian). https://doi.org/10.33763/finukr2019.06.023

32. Sulla, V., Zikhali, P., Schuler, P., & Jellema, J. (2017). *Does fiscal policy benefit the poor and reduce inequality in Namibia?* World Bank. Retrieved from https://documents1.worldbank.org/curated/en/991551497258273367/pdf/116029-WP-P148652-PUBLIC-NamibiaCEQReport.pdf

33. Szczepaniak, M. (2020). Redistribution and the alleviation of income inequalities: The case of the European Union. *Ekonomia i Prawo. Economics and Law, 19*(1), 149-161. https://doi.org/10.12775/EiP.2020.011

34. Verberi, C., & Yaşar, S. (2021). The effects of social spending on income inequality in 30 OECD countries. *İstanbul Journal of Economics, 71*(1), 39-57. https://doi.org/10.26650/ISTJEC-ON2021-808121

35. Wildowicz-Szumarska, A. (2022). Is redistributive policy of EU welfare state effective in tackling income inequality? A panel data analysis. *Equilibrium. Quarterly Journal of Economics and Economic Policy, 17*(1), 81-101. https://doi.org/10.24136/eq.2022.004

36. Wroński, M. (2023). The impact of social security wealth on the distribution of wealth in the European Union. *The Journal of the Economics of Ageing, 24,* Article 100445. https://doi.org/10.1016/j.jeoa.2023.100445