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The Role of Government in Tackling Income Inequality: Evidence From Central and Eastern European Countries

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Abstract

The aim of this study is to investigate the role of government interventions in lowering income inequality in post-communist economies of Central and Eastern Europe (CEE). The focus is set on three key policy instruments: progressive income taxation, social transfers, and minimum wage regulations. We use the Gini coefficient for market income and the Gini coefficient for disposable income to quantify income inequality in observed economies and to estimate how government policies tend to create differences between these two measures. We use open panel data from period 2012–2021 to determine the latest effects of these policies in the post-communist CEE economies. The main finding is the positive role of progressive income taxation, which significantly lowers the Gini coefficient for disposable income, effectively lowering income inequality in observed economies.

Keywords

CEE Countries, Income Inequality, Fiscal Policy, Gini Coefficient, Minimum Wage

I. Introduction

Significant economic and social transformations have accompanied the transition from centrally planned economies to market-oriented systems in post-communist countries. These effects can be still visible in current economies. One of the most pressing issues that have emerged after this transition is income inequality.

Income inequality remains a pressing issue for these countries because of its economic, social, and political implications. It is important to address this issue to foster a more equitable and sustainable society in the modern world. Income inequality remains a crucial topic for several reasons. It's a matter of fairness and justice in societies together with

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equal opportunity. When a small portion of the population holds a significant portion of the overall wealth, it can lead to disparities in living standards, access to resources, and opportunities.

Extreme levels of income inequality can even negatively affect overall economic growth. When a vast majority of the population has limited purchasing power, it can constrain aggregate demand. Unequal distribution of income can also lead to social tension and instability and undermine trust in institutions further disrupting economic activities due to crime and civil unrest. People with the lowest incomes often have limited access to education and health services, leading to poorer health and reduced life expectancy compared to people with higher incomes.

Governments, hence, should take an active role in improving the current development regarding income inequality. Government bodies have various tools at their disposal to address this issue. One of the options is to implement progressive taxation systems where higher-income individuals are taxed at higher rates. This helps to redistribute income by collecting more revenue from individuals, who can afford to pay more and use these financial means to fund social net programs that benefits the lowest-income households. Furthermore, active support of job creation and provision of retraining programs can downplay the labour market situation to help individuals to acquire a decent salary. The government can also directly influence the lowest threshold for salaries inside the economy with the institution of minimum wage.

This article aims to examine the current situation regarding income inequality for both market and disposable income in selected CEE countries. It will also provide the latest empirical evidence, on how governments can help reduce income inequality using progressive taxation, social protection benefits, and the minimum wage.

II. Measuring Income Inequality

The area of research for this paper is focused solely on income inequality, not considering wealth inequality. Regarding the latter issue, see for example Jakurti (2024) or Brzeziński et al. (2020), who examined wealth inequality also in post-socialist economies. To address the issue regarding income inequality, first, we need to be able to properly measure and quantify this phenomenon. Many different concepts of income inequality exist. Dorjnyambuu (2024) in his review lists several possible measurements using different income distributions, such as percentile and share ratios (P90/P10, P90/P50 or S80/20) or indexes such as Robin Hood index, Bonferroni index, or Gini index. The most frequently used measurement in empirical studies, however, is the latest – the Gini coefficient.

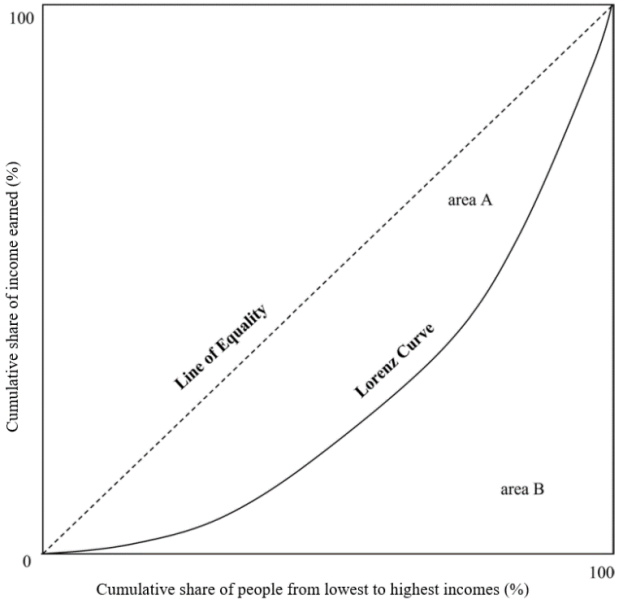
This key indication developed by Corrado Gini, the Italian demographer and statistician, is derived from the Lorenz curve. The Lorenz curve, designed by American economist Max Otto Lorenz, is a simple and convenient method to show income distribution in the population based on the rank cumulative distribution of income and the number of individuals – recipients of income (Siddiq et al., 2023). The Lorenz curve constitutes a graphical representation method of income inequality that plots the cumulative percentage of total income received against the cumulative percentage of the corresponding individuals ranked in ascending order.

The Gini coefficient then quantifies the level of inequality based on the ratio of the area between the Lorenz curve and the line which illustrates the perfect equality. An illustration of the Lorenz curve can be seen in Figure 1. The Gini coefficient is hence determined with the equation 1:

$$\text{Gini coefficient} = \frac{area\ A}{(area\ A + area\ B)} \tag{1}$$

The Gini coefficient can take any value from 0 to 1. Zero is for a hypothetical situation in which all individuals in the economy have the same income. The Lorenz curve is then identical to the line of equality. Area A is zero meaning the value for the Gini coefficient is zero as well. The Gini coefficient of value one is exactly the opposite hypothetical situation of absolute income inequality. This would mean that all individuals in the economy do not have any income except one individual who has an absolute income in the economy. The Lorenz curve then follows the *x*-axis to the right. In this situation, area B is zero and the Gini coefficient is quantified as one. For more information regarding the estimation of the Lorenz curve, see Sitthiyot and Holasut (2021).

Figure 1: Illustration of the Lorenz curve



Source: own modification based on Siddiq et al. (2023)

We can distinguish two different Lorenz curves. One is for market income and the second is for disposable income. Market income represents the primary income one individual gets for his work without any deductions in the form of income tax or social security

contribution. Disposable income is in simplicity a net salary. You get disposable income from market income after tax payments and adding transfers. (Kliková and Kotlán, 2019) Based on these two Lorenz curves, we can calculate two separate Gini coefficients – one for market income and one for after-tax and transfer (disposable) income. The numerical value of the difference between these two coefficients shows the impact of government policies lowering the income inequality among the population. This can be seen in Hasell (2023). This approach using two Gini coefficients is implemented in this paper to help estimate the overall effects of government policies in pursuit of better income equality.

III. Literature Review

Income inequality is a significant global issue, with governments recognizing the importance of addressing this challenge. The Sustainable Development Goals (SDGs), with a set of 17 global goals adopted by the United Nations in 2015 as part of the 2030 Agenda, aim to address societal challenges, including poverty, hunger, health, education, equality, the environment and economic growth. Income inequality is one of the key issues addressed by these goals and is an important element of several goals. Economic policy can be a significant tool for tackling income inequality and promoting sustainable development. In fiscal policy, the area of setting taxation in favour of solving the problems of inequality is important. A stable and predictable monetary policy can support economic growth and employment, which contributes to reducing income inequality. Setting and increasing the minimum wage in the state's labour policy can ensure decent incomes for workers. Promoting fair trade practices can mean that the benefits of globalization and trade are shared fairly and contribute to reducing inequalities. Robust and inclusive welfare systems can protect individuals from economic risks and contribute to reducing poverty and inequality. Economic policy is, therefore, a key instrument for achieving the Sustainable Development Goals and reducing income inequality, and it must be comprehensive, inclusive, and oriented towards long-term sustainability, which is a key aspect of the governance of the countries of the European Union.

Various studies shed light on the role of governments in tackling income inequality through different mechanisms and policies. Ullah et al. (2021) emphasize the significance of factors such as globalization, economic growth, e-government development, government expenditure, and inflation in reducing income inequality and poverty. This highlights the multifaceted approach governments need to adopt to address income disparities effectively.

Jones and Llewellyn (2019) stress that governments aiming to tackle inequalities must increase public spending and taxation levels to address income and capital disparities effectively. This suggests that a proactive fiscal approach is essential for governments to make a substantial impact on income inequality. Guzi and Kahanec (2018) further support this notion by indicating that the role of government in mitigating income inequality is often underestimated in the literature, emphasizing the need for a more comprehensive understanding of the government's impact on income distribution.

Tax policies emerge as a crucial tool in addressing income inequality, as highlighted by (Lin and Tian, 2021). They argue that redistributing wealth through tax policies can lead to a more equitable distribution of resources and contribute to reducing income inequality.

Menz (2020) provides a practical example of how the Chinese government addresses income inequality by supporting low-income earners and reducing the tax burden for those in lower income brackets, showcasing the direct interventions governments can implement to tackle income disparities.

The quality of governance emerges as a critical factor in addressing income inequality, as Gulati and Ying (2021) identify it as a significant predictor for improving income distribution. This underscores the pivotal role of governments in providing quality public services such as education and healthcare to reduce income disparities. Beyene (2023) emphasizes the importance of governance quality in mitigating the impact of economic complexity on income inequality, highlighting the interconnected nature of governance and economic disparities.

One of the key mechanisms through which governments can tackle income inequality is by implementing progressive income taxation. Atkinson et al. (2017) highlight the significance of tax-benefit reforms in reducing poverty and inequality, emphasizing major changes to the income tax system as a means to address income disparities. Progressive income taxation involves taxing higher incomes at a higher rate, thereby redistributing wealth from the affluent to the less privileged segments of society. This approach aims to ensure a fairer distribution of resources and reduce the wealth gap between different income groups.

In addition to progressive taxation, social transfers play a vital role in mitigating income inequality. Social transfers encompass various forms of government assistance such as welfare programs, unemployment benefits, and social security. These transfers serve as a safety net for vulnerable populations, providing them with financial support and access to essential services. Franko and Witko (2017) emphasize that government responses to income inequality are often influenced by public awareness and concern about the issue. When there is a growing recognition of income disparities within society, governments are more inclined to implement social transfer programs to address the needs of disadvantaged individuals and families. Antošová and Stávková (2019) examined social policy systems in a panel of countries. They found different income impacts based on the structure of social transfers, especially considering old-age pensions. This may play an important role in mitigating risk of poverty, as it helps to use a targeted social welfare aid.

Minimum wage regulations also play a significant role in combating income inequality. Setting a minimum wage floor ensures that workers receive a decent income for their labour, thereby reducing poverty and enhancing economic well-being. Bükey (2022) underscores the importance of minimum wage policies in reducing inequality, although it is noted that private sector wage increases may lead to a rise in inequality. By establishing a minimum wage that provides a basic standard of living, governments can uplift the economic status of low-wage workers and narrow the income gap within society. The impact of minimum wage policies on income distribution has been the subject of extensive research. Chen and Xu (2024) highlight the role of minimum wage increases in regulating household income distribution, particularly by boosting the wages of employed individuals in households. Minimum wage adjustments can have a direct impact on the income levels of low-wage workers, contributing to a more equitable distribution of wealth. The effects

of minimum wage policies on income inequality vary across different contexts. Guo (2024) found that while minimum wage increases benefited low-income groups, they had a negative impact on workers whose incomes were within a certain range of the previous minimum wage, underscoring the nuanced effects of such policies on income distribution. The interplay between minimum wage policies, poverty, and income inequality has been a subject of scholarly inquiry. Paz-Báñez et al. (2024) emphasize that the primary objective of minimum wage measures is to ensure that workers can maintain a decent standard of living, thereby contributing to poverty reduction and inequality mitigation. By guaranteeing a minimum level of compensation for labor, governments can uplift low-income individuals and families, thereby fostering greater economic equality. The redistributive effects of minimum wage increases have also been examined, with Alinaghi et al. (2020) conducting a microsimulation analysis in New Zealand to assess the impact on income inequality. Their findings suggest that while minimum wage adjustments have a modest effect on income inequality, they can contribute to enhancing the economic well-being of low-income households.

Looking closely at CEE economies, they show a rather turbulent development concerning income inequality. CEE countries showed consistently low levels of income inequality during their socialist period before the transition. Medgyesi and Tóth (2021) evaluated the Gini coefficient for CEE economies in the 1980s to be below 0.25, which is significantly lower than in the post-transition era. This common starting point was one of the motivations for choosing exclusively CEE countries to examine income inequality in this paper. There are several reasons why rather low income inequality is expected in state-controlled economies. The absence of market-driven forces such as supply and demand helped maintain stable and uniform wages across different sectors and regions. Furthermore, in the socialist regime the state controlled wage levels and maintained a relatively narrow wage distribution. High earners and low earners had smaller income differences compared to market economies.

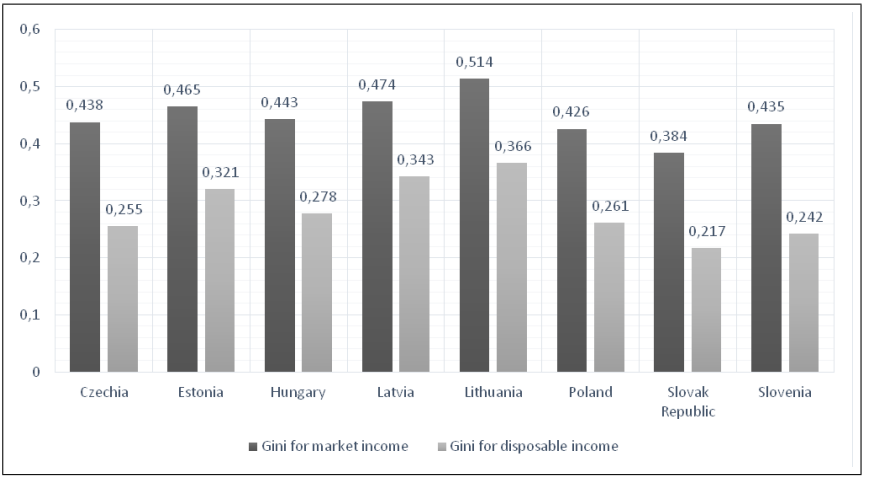
However, once the transition to a market economy started for these countries in early 1990s, significant changes caused a rise in the income inequality. According to Dorjnyambuu (2024) earning disparities and a rise in income inequality were present in CEE countries, but the magnitude was different for each country. Večerník (2012) provides a comprehensive review of the Gini coefficient estimates development for four core CEE countries (Visegrad group) during the 1990s and 2000s, where you can see rising Gini coefficient for disposable income. Dorjnyambuu (2024, p. 14) states: *"The key contributors to rising income inequality in CEE countries throughout the transition period were widening diferences in labour income distribution, the increasing importance of capital income, and the weakening impact of welfare state programmes on redistribution."*

We look deliberately at these post-communist countries to check not only the latest situation regarding market and disposable income inequality but also what role individual governments play in helping with their intended policies. The next chapter will go into analytical details to present the data and methodology used in this paper.

IV. Data and Methodology

This paper investigates income inequality in eight CEE countries, which are both member states of European Union (EU) and the Organisation for Economic Co-operation and Development (OECD).[5] All these economies undergo a transition from the centrally planned economy to the market economy. As mentioned in the literature review, this provides a unique perspective to see what the current state of these countries regarding income inequality is. We measure income inequality using Gini coefficient for both market income and disposable income. The difference between these two indexes shows how government policies can mitigate levels of income inequality. We check these intended policies using panel data regression analysis from the period 2012 to 2021. First, we would like to compare the current situation in these eight economies, as this is one of the aims for this paper. This can be visible in the figure 2.

Figure 2: Gini coefficient in CEE countries (2021)



Source: OECD data explorer, own modification

The situation is not homogeneous in observed economies at first glance. Countries have significant differences in income inequality for both market and disposable income. Slovakia shows the lowest levels for both being the only country with a Gini index for market income less than 0.4. Lithuania is on the other side of the spectrum as it has the highest level of income inequality in observed economies. It is also the only country with a Gini index for market income higher than 0.5.

Figure 2 also illustrates the impact of the government's aftermarket redistribution policies on lowering income inequality. This is represented by the difference between black and grey columns for each country. Slovenia shows the biggest difference between the two Gini indexes in the latest data from the year 2021 – almost 0.2. However, even Latvia with the lowest change in the Gini indexes has this difference of 0.13, meaning that all

[5] Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia.

eight CEE economies have systems of government tools significantly lowering disposable income inequality.

After this initial analysis of current state of income inequality, we need to take a deeper look to investigate the impacts of the individual setting of government policies. As mentioned, we evaluate the impact of three possibilities, how governments can help to reduce income inequality – progressive income taxation, social transfers, and minimum wage. We will estimate their effects on the difference between the Gini coefficient for market income and the Gini coefficient for disposable income. This will be our dependent variable.

Next, we use three independent variables, which approximate or quantify three mentioned government tools, which should contribute to the difference between two Gini coefficients. Net social protection benefits as a portion of nominal GDP ("SOC") approximate social transfers to the population. This is a simplification, however, it enables a comparison among observed economies, as real economies have transfer payments with different attributes such as size, conditions, etc. Data for the share of net social protection benefits is retrieved from the Eurostat.

Another independent variable is proxy for income tax progressivity. Tax progressivity is quantified using the tax wedge indicator for different wage levels. The tax wedge is defined by OECD (2017): *"It is the ratio between the amount of taxes paid by an average single worker (a single person at 100% of average earnings) without children and the corresponding total labour cost for the employer."* To proxy income tax progressivity, the span ranges from 67 percent (TW_{67}) to 167 percent of average earnings (TW_{167}), respectively. This may not capture global progressivity in each economy, but a majority of the population should have labour income within this range. Independent variable ("PROG") is then a difference between these two tax wedges for different income levels, see equation 2. Higher values for PROG mean a higher progressive scheme of income taxation. Data for both tax wedge indicators originate from the OECD data explorer.

$$PROG = TW_{167} - TW_{67} \tag{2}$$

The third independent variable presents the minimum wage ("MW"). To use the minimum wage to compare it's setting in different economies, rather than use absolute values of the minimum wage to a common currency, such as euros or dollars, we rather use the level of the minimum wage relative to the average wage in each economy. This should provide a much better picture to illustrate how this can be beneficially to equalize the threshold for basic income.

Above is listed summary and explanation regarding variables used in this research. To give you an even more detailed overview of data, Table 1 contains descriptive statistics for each variable.

Estimation techniques vary based on the data analyzed, as mentioned in Baltagi (2013). Standard ordinary least square (OLS) regression may not be the best solution for this type of data. We tried both fixed-effect and random-effect panel estimators and based on the Hausmann test, we used a fixed-effect panel estimator as being more efficient in this situation. Moreover, as we want to check estimation results for levels of selected variables, we may come across issues regarding stationarity. The standard procedure is

then to use the first differences of variables with unit-root. However, as we want to check all variables in levels, we add a lagged dependent variable as one of the regressors leaving other independent variables in levels. This should help with the non-stationarity issue, as the lagged dependent variable used as a regressor helps mitigate the trend causing unit-root. Results of the empirical analysis follow in the next chapter.

Table 1: Descriptive statistics of used variables

Variable	Mean	Min	Max	Label	Source
Difference between Gini coefficients	0.168	0.126	0.235	GINI	OECD Data Explorer
Proxy for income tax progressivity	3.622	0.000[6]	8.955	PROG	OECD Data Explorer
Share of net social protection benefits to GDP	17.732	13.610	25.280	SOC	Eurostat
Minimum wage relative to average wage in percent	39.786	30.730	51.931	MW	OECD Data Explorer

Source: own calculations

V. Empirical Results

Before the results of the econometric analysis itself are shown, we should discuss the expected results. Empirical estimation should reveal the average effect of each of the government policies on income inequality. This study contains data from 8 post-communist CEE economies. These economies, although having some similarities from a historical and socio-economical perspective, differ significantly in their respective current government policies. The reason for this econometric estimation is to gain more recent empirical evidence, which can be generalized for CEE economies. The current situation is unique in each country, but we can expect that all three policies (progressive income taxation, higher social transfers, and higher relative minimum wage) should lower income inequality.

As a dependent variable is the difference between the Gini coefficient for market income and the Gini coefficient for disposable income, we can expect a positive coefficient for these policies. A higher value for estimation coefficients of independent variables would mean a bigger impact on income equality on average. The results of the econometric estimation are presented in table 2.

Only one estimate for government policies is statistically significant in table 2. Variable PROG which represents income tax progressivity is positive and significant. Value for its coefficient can be interpreted such that economies where tax wedge for workers with 167 percent of average wage (AW) is higher by one percentage point than tax wedge for workers with only 67 percent AW, have on average the difference between both Gini coefficients higher by 0.0018. This may not seem like much but bear in mind that PROG measures only a part of income tax progressivity (range from 67% to 167% of average wage), many countries have marginal income tax rates for higher levels of wages. For example, the Czech Republic currently has a second marginal tax rate for citizens with three times the average salary and above. Progressive income taxation can be considered an effective tool to lower income inequality based on this result.

[6] Hungary does not show income tax progressivity based on these wage levels for years 2013–2021, hence value zero for "PROG" variable.

Table 2: Fixed-effect panel regression[7]

Variable	Coefficient	t-statistics	p-value
Constant	0.0350	1.801	0.115
GINI (−1)	0.7034***	6.067	0.001
PROG	0.0018***	3.883	0.006
SOC	−0.0002	−0.638	0.544
MW	0.0002	0.808	0.446
Number of observations	71[8]		
Within R2	0.66		
LSDV R2	0.95		
Durbin-Watson statistics	1.90		
p-value for Pesaran CD test	0.823		

Source: own calculations

The estimation result for the independent variable SOC is negative but not statistically significant with a *p*-value much higher than 0.10. This is a rather surprising result as social transfers are supposed to have a positive effect on income inequality, such as income tax progressivity. An inconclusive outcome can have several explanations. Social protection benefits show the overall transfer spending of government as a percentage of GDP. Eurostat (2024) shows that 3/4 of all expenditures to social protection benefits in EU countries consist of only two functions – old age pensions and sickness/health care. As these are important transfers, their role in overall benefits may overshadow other types of transfers which may contribute more to lower income inequality. This issue can be solved by dividing overall social expenditures based on their function.

The coefficient for the third independent variable focused on minimum wage is positive but also not statistically significant. One reason is that the level of minimum wage has a primary effect on lowering the Gini for market income, as it prevents market income from being lower than a certain threshold. However, we anticipated a slight effect on lowering disposable income inequality as well, as minimum wage sets an impulse for wage negotiation in other wage levels. The minimum wage can also be the benchmark for certain social benefits and transfer payments, as in some countries these are linked together.

Besides the estimation coefficient, table 2 contains some parameters of regression itself. You can see the coefficient of determination, which shows a high explanatory value of the model. This is partly caused by the added lagged dependent variable and it suggests a large continuity in the data in time dimension. Durbin-Watson statistics is close to two, which

[7] GINI is the dependent variable for this regression. The number of stars next to the coefficient represents the significance level: (*) 10%, (**) 5%, and (***) 1%. All coefficients are rounded to four decimal points while *t*-statistics and *p*-values are rounded to three decimal points. Heteroskedasticity-consistent standard errors are used to allow the fitting of a model that does contain heteroskedastic residuals.

[8] There is not available data for Gini coefficients in Estonia for the year 2012, hence there is missing one observation.

is the optimal value suggesting no autocorrelation. Lastly, the *p*-value for the Pesaran cross-sectional dependence is higher than 0.1, so we cannot reject the null hypothesis of no cross-sectional dependence in our data.

VI. Conclusion

The presented article is an empirical research paper to examine the current situation regarding income inequality and provide the latest empirical evidence, on how governments can help reduce income inequality. The latest trend regarding income inequality was observed in 8 CEE developed economies. Observed countries exhibit different levels of market income inequality measured with the Gini coefficient and also different effects of government policies that lower disposable income inequality.

Authors acknowledge that income inequality is a natural phenomenon as individuals have different backgrounds, skill sets, opportunities, and access to higher-paying jobs. Certain level of income inequality may not be issue, as it is simply a result of different social classes, determination, and added value of individuals in economy. However excess income inequality may be problematic as it creates social tension, instability, and limitations to economic processes in each country. Governments should have mechanisms in place to partly minimize the impacts of unequal incomes in the economy and help to provide the same opportunities to citizens. Three main tools are considered in this article – income taxation progressivity, social protection benefit expenditures, and level of minimum wage. All these tools of government policy should in theory minimize inequality in the disposable income of individuals.

This was tested using an econometric approach. Fixed-effects panel regression was performed on proxies for these three government policies to check their impact on lowering income inequality in selected economies. Income tax progressivity showed a positive and statistically significant effect, which should effectively lower income inequality. Governments can use tax progressivity to effectively decrease income inequality using several marginal tax rates or fixed tax reliefs.

In conclusion, the role of government in tackling income inequality is multifaceted, encompassing public accountability, governance, and fiscal policy improvements. By implementing policies that promote a fairer distribution of wealth, governments can address income disparities, reduce poverty, and enhance economic equality within society. The effectiveness of these measures in combating income inequality underscores the importance of evidence-based policy interventions that prioritize equity and social justice. By addressing these various aspects, governments can make significant strides in reducing income disparities and promoting a more equitable society.

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