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THE METHOD FOR EVALUATION OF CONSUMPTION TAX REGRESSIVITY

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Abstract. Tax policy, tax progressivity, and income redistribution from higher to lower income earnings are effective economic measures for reducing inequality. The aim of the paper is to elaborate principles of measurement of consumption tax impact on income inequality or level of consumption tax regressivity. The objectives are to compare methods for evaluation of income and consumption tax impact to income inequality and to find the possible solutions how to measure consumption tax impact to income inequality. As result was developed a specially designed method which can be used for evaluation of consumption tax impact to income inequality, as well as an appropriate measurement is recommended.

Keywords: income inequality, income redistribution, tax policy, consumption taxes, tax regressivity.

JEL Classification: E24, H21, H24.

Introduction

The social dimension, including reducing inequalities and incomes redistribution, is essential for sustainable national growth. Many countries still have high income inequalities in the European Union, especially in Eastern Europe (Dobrzanski, 2019; Dauderstädt, 2021). Tax policy is usually an effective tool for income redistribution. However, society's desire for dynamic economic development, but ill-considered decisions by politicians, often supports only a few entrepreneurs or interest groups with tax policy, which means that society's income does not grow evenly for everyone, but some individuals are able to earn much more. The COVID-19 crisis has even more exacerbated income inequality.

In fact, income inequality is impacted by a regressive tax burden. It is generally accepted to measure income inequality before and after income taxes. The GINI coefficient makes it possible to assess income inequality in general, but the Kakwani coefficient makes it possible to assess the effect of income tax progressivity on reducing income inequality. However, because low-income people consume a substantial share of their income on core needs, the regressive tax burden is generated by value added tax and other consumption taxes. As a result, the effect of consumption taxes on income disparity should also be assessed.

Inequality is one of the greatest economic, social, and political challenges of our time. Inequalities within and between countries are a permanent cause for concern, despite some positive signs progress in some areas, at the same time developed economies rapidly distanced themselves compared with the rest of the world. While the income of the bottom 40% of the population grew by more than 2 percent between 2012 and 2017, only in about half the countries it has been higher than the average growth for the total population (Unstats, 2021).

Economic growth is one of the main macroeconomic variables which indicates the quality of living standard and welfare level of the society. The relationship between economic growth and inequality has been assessed in many studies, but the conclusions are rather complicated (Kakwani & Son, 2003). Many recognize that inequality diminishes opportunities for economic growth (Barro, 2000; Berg & Ostry, 2011), it increases the risks of the crisis, or it may also bring political instability, which can discourage investment. But there are some economists, who recognise that certain inequality is essential for the efficient functioning of the market economy and for the incentives needed for investment and growth (Chaudhuri & Ravallion, 2006).

COVID-19 has had a significant impact on all national economies in recent years and it has slowed down the

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growth of economy in last decades in the EU. Moreover, its emphasis the problem of income inequality which remains actual issues in any of the EU country. The higher income inequality in recent years was in Bulgaria where Gini coefficient of equivalised disposable income was 40.0 in 2020 (Eurostat, 2020).

Fiscal incentives only have a favorable effect on economic agents if they result in long-term income growth. As a result, implementing unpredictable fiscal policies can have negative consequences for the economy, production, and social welfare (Dobrotă et al., 2021)generating positive or negative impulses, both on short and long term. The present research focuses on analysing the effects of the discretionary changes in the fiscal policy in seven post-communist countries of the European Union during the period 2000–2018. The autoregressive distributed lag model (ARDL).

One of the most effective mechanisms governments use to reduce economic inequality is taxation and their redistribution. National tax and redistribution policies must be carefully developed to balance the distribution and efficiency objectives.

The level of inequality depends on several factors, including the globalisation and liberalisation of markets, the progressivity of income taxes and taxation policies in general, skills-oriented technological change, the change in the number of low-skilled workers.

The difference in the Gini index before and after taxes and social transfers makes it possible to determine how effectively this policy realises income and reduces inequality. Taxation system is proportional when income inequalities before-tax and after-tax income are identical. Tax policy should be founded on proportionality, which means that citizens of each state should contribute to the government's support in proportion to their respective skills and the revenue they receive (Kakwani, 1977).

Tax policy is usually an effective tool for income redistribution. However, society's desire for dynamic economic development, but ill-considered decisions by politicians, often supports only a few entrepreneurs or interest groups with tax policy, which means that society's income does not grow evenly for everyone, but some individuals are able to earn much more. The COVID-19 crisis has even more exacerbated income inequality.

The European Union countries have very different average tax burdens, but the average tax burden does not indicate income inequality, it can vary widely in each country. It is vital to examine the tax burden and its impact on people of various income levels to better understand the causes of income inequality.

The tax load on low-income people in Latvia, for example, is much greater than the EU average and higher than in other EU countries, according to a review of the tax burden. Latvia's tax burden mainly falls on low-income persons, i.e., the tax burden on low-income persons is much higher than average, but lower for high-income persons. When comparing the tax burden on disadvantaged persons (under 5000 EUR per year), it was significantly higher than in other countries (World Bank, 2014).

Inequalities in income are exacerbated by such tax systems. The Gini coefficient of equivalised disposable income was 34.4 in 2020 (Eurostat, 2020), indicating that revenue distribution and social transfers are insufficient to address income inequality, solutions should therefore be sought within the tax system itself.

The aim of the paper is to elaborate principles of measurement of consumption tax impact on income inequality or level of consumption tax regressivity. The objectives are to compare methods for evaluation of income and consumption tax impact to income inequality and to find the possible solutions how to measure consumption tax impact to income inequality.

1. Literature review

The debate on the role of taxation over the various periods affecting tax revenues on inequality and tax composition was dominated by opposing views.

In the 1950's, economists particularly began to emphasise the role of the government in supporting a fair tax system based on general measures of progressivity (Musgrave & Thin, 1948). In addition, to investigate the consequences of income disparity caused by tax policy, Musgrave and Thin looked at the effects before and after the income tax. Taxation was thought to be a significant governmental tool that could be applied to raise revenue (Musgrave, 1959), while progressive taxation was considered strategically crucial for improving income distribution and promoting a more equitable economic development process (Kaldor, 1963).

The early 1970s crisis cast doubt on the effectiveness of taxes in affecting income distribution and correcting market flaws. Moreover, there was a widespread view that taxes might have a negative influence on growth, affecting consumer and investment decisions (Feldstein, 2012). Therefore, it has been suggested on several occasions that government spending is the only way to accomplish effective achievements in the subject of equality (Bird & Zolt, 2013).

In any case, tax progressivity's costs and benefits are determined by government tax policy, which has a significant effect on economic growth and stability, level of employment, fairness (opportunity or equitable outcome), and social welfare (Papanikolaou, 2021).

Over the past decade, more and more economists (Atkinson, 2015; Piketty, 2014) have returned to the significance of a taxation policy role that promotes more equal income sharing.

Factors influencing income inequality are mainly mentioned: labour market, globalization, technological change, policy reforms, disproportionate tax burdens, various forms of discriminating (ethnic, racial, gender, etc.); economic development speed and other factors (Charlton, 1996; Chomsky, 1999; Kuznets, 1955; Rawls, 2005).

Income inequality is an indicator of how material resources are distributed in society. High-level income inequality is considered morally undesirable. Income inequality creates unwanted consistency – causes dissatisfaction, health problems, reduces life expectancy, creates conflicts, limits cooperation, and causes other undesirable phenomena (Wilkinson & Picketty, 2009).

Inequality in society is caused by a variety of factors. According to studies, income disparity is tightly linked to the development of the economy and living standards (Organisation for Economic Cooperation and Development, 2008). Income inequality is lower in wealthy countries. This is due to better social policies and more opportunities for revenue sharing and social transfers. Traditionally, lower income inequality is found in Western Europe and Scandinavia.

One of the main causes of income inequality is unemployment. It is also affected by national tax policies, and corporate income tax has an impact on this factor (Zirgulis & Šarapovas, 2017).

Aside from the influence on the economy and inequality, it also has long-term consequences, primarily affecting the export of labor without discrimination, thereby emptying the country of young people in pursuit of a better future, potentially increasing the risk of age dependency (Bajra, 2021)the findings show that while remittances influence economic growth, their inflow also promotes a high level of migration and absorbs a large workforce by influencing the labor market and encouraging uncontrolled individual relocation. This paper also reveals that although remittances have eased income inequalities the share of remittances in a country's economy has declined over the years. After testing for the endogeneity of remittances and controlling for various variables, the results indicate that migrant workers' remittances do not provide strong support for economic growth and inequality. For the sample average, a 1-percent rise in the share of remittances in the economy (i.e., to GDP).

It is recognised that a larger wage gap is one of the main consequences for income equality. Widening economic disparities is also an unavoidable consequence of free market economics (Piketty, 2014).

Consumption taxes make up 30% of government revenue in developed economies. According to a study (Kato, 2003), there is a positive relationship between consumption taxes and welfare, which has a positive effect on inequality reduction.

Several economists point out that indirect taxes are distributional neutral, not regressive, because their effects are judged as a share of spending rather than income (Bourquin & Waters, 2019). Mortano (2016) acknowledges that the increased contribution of direct taxation to indirect taxes contributed to the progressive nature of the tax system and contributed to the reduction of inequalities.

At the same time, some scientists point out that that an exclusive focus on direct taxes offers a limited and somewhat distorted picture of the role of taxes in government inequality reduction. It is recognised that although indirect taxes are almost always regressive, they nevertheless play a crucial role in obtaining revenue that funds reallocation for national social transfers. Empirical analysis (Mahler & Jesuit, 2018) shows that the basic structure of indirect taxes is regressive, but it is often significantly reduced by lower rates or exemptions for basic needs embedded in many systems.

Recent studies have found that tax policy, tax progressivity, and income redistribution from higher to lower income earnings are effective economic measures for reducing inequality (Kranzinger, 2020; Papanikolaou, 2021).

Using method for imputing consumption expenditure across countries, using data on income and other socio-demographic determinants (Blasco et al., 2020), the findings reveal that consumption propensities decrease with income, that consumption taxes result in a considerable increase in income inequality, and that the tax rate determines the difference in the distributive effect of consumption taxes across countries.

2. Method

Generally, income inequality is measured by the GINI coefficient (Gini, 1921), which can be determined by comparing theoretical revenues with actual income in the corresponding quintile group. The impact of income tax on income inequality can be characterized by the classical Kakwani coefficient (Kakwani, 1977), which can be calculated according to the following Equation:

$$K_I = G - G_I , \tag{1}$$

where: K_I – coefficient of income tax impact to income inequality; G – GINI coefficient of pre-tax incomes, G_I – GINI coefficient after imposition of income taxes.

A positive K_I coefficient indicates that the impact of taxes on income is progressive (which reduces income inequality), whereas a negative K_I coefficient indicates that the impact of taxes on income is regressive (which increases income inequality).

The traditional Kakwani coefficient (K_I) does not, however, allow for the identification of the elements that affect the regressivity of the tax burden, or even which factors should be modified by taxes.

To fully assess the impact of taxes on income inequality, the overall tax burden must be considered: the tax burden on both income and consumption, since consumption taxes can also affect any income recipient, especially those on low incomes, as they consume most or even all their income. In this context can be used a method of assessment of consumption tax burden (Jurušs, 2016).

The method is based on the theory of consumption by John Maynard Keynes (Keynes, 1936) particularly in relation to a concept of the marginal propensity to consume (MPC). MPC is the proportion of extra disposable income that an individual spends. The concept is that an

increase in disposable income (Y) leads to an increase in personal consumer spending or consumption (C) (income after income taxes and transfers).

The basic thesis is that as people's income increases, their consumption increases, but after reaching a certain income level, their consumption is already increasing at a slower pace or the marginal rate of consumption taxes and, as a result, the burden of these taxes on each subsequent income unit decreases. As changes of consumption are affected by changes of disposal income, it means for low-incomes individuals consumption tax changes on one additional unit of disposal income has higher consumption tax burden effect. Thus, consumption taxes have a greater impact on persons with lower incomes (Jurušs, 2016).

Consequently, the impact of consumption taxes on income inequality can be characterized by a specific K_C coefficient, which can be calculated according to Equation:

$$Kc = G - Gc, \quad (2)$$

where: K_C – coefficient of consumption tax impact to income inequality; G – GINI coefficient of pre-tax incomes, G_C – GINI coefficient after imposition of consumption taxes.

A positive K_C coefficient indicates that impact of the consumption taxes is progressive (which reduces income inequality), whereas a negative K_C coefficient indicates that the impact of consumption taxes is regressive (which increases income inequality).

Unlike the classical Kakwani coefficient, based on the results of the K_C coefficient, it can be analysed what has had an impact by looking in detail at the consumption structure of the group concerned and the burden of consumption taxes (basically VAT) on the groups of goods or services concerned.

It could be more difficult to determine income inequality (G_c) after consumption taxes, as consumption taxes are imposed significantly different way from income taxes. Therefore, the method can be applied in practice in combination of estimation of consumption tax burden of various income level (Jurušs, 2016). It can be based on data on the national average consumption tax burden. Just as the GINI coefficient compares theoretical income with actual income, this method compares theoretical consumption with actual consumption in each group of quintiles.

Particularly, consumption tax burden on specific group of quintiles can be calculated by the following Equation:

$$T_{CN} = T_{CA} \times \frac{I_A}{I_{TA}} \times \frac{C_N}{I_{TN}}, \quad (3)$$

where: T_{CA} – average consumption tax burden, I_A – average income before income taxes, I_{TA} – average income after income taxes, I_{TN} – income of specific group of quintiles after income taxes, C_N – consumption by specific group of quintiles.

3. Results

The method was used to estimate consumption tax regressivity for different quintile groups in Latvia (see Table 1).

Table 1. Consumption tax burden in Latvia, 2018 (source: Calculations by authors by using data from (Central Statistical Bureau, 2018)

Quintile	Income before income taxes (MEUR)	Income after income taxes* (MEUR)	Consumption (MEUR)	Consumption tax burden, %	Income after consumption taxes (MEUR)
N	*I*	I_T	*C*	T_C	I_{CT}
1	697.4	591.6	665.8	12.2	625.2
2	1174.1	963.3	912.2	10.3	1075.2
3	1644.9	1314.6	1142.2	9.4	1521.1
4	2307.5	1755.0	1382.8	8.5	2157.6
5	4503.6	3375.3	2108.3	6.8	4275.0
Average	2065.5	1600.0	1242.3	8.4	1930.8

Note: *Income taxes: personal income tax and state social contribution paid by employee.

The calculations were performed in the following steps:

- It was obtained the information on pre-tax income, income after tax and consumption in the relevant quintile groups (see column '*I*', 'I_T' and '*C*' in Table 1) (Central Statistical Bureau, 2018);
- Consumption tax burden was calculated by Formula 3 (see column 'T_C' in Table 1);
- Income after consumption tax was calculated (see column 'I_{CT}' in Table 1).

More detailed analysis of the data (Central Statistical Bureau, 2018) shows that people with lower earnings (Group 1) spend most of their income on consumption, primarily food, whereas consumption declines in groups with higher incomes as a portion of their money is saved or invested rather than consumed. Furthermore, according to data from Group 1, persons spend more than they earn, which could be explained by loans or illegal (undeclared) incomes.

At the same time, consumption reduces in groups with higher incomes, especially Goup5 (see Table 1) as a part of their income is saved or invested rather than consumed.

In 2018 the average consumption tax (particularly, value added tax (VAT)) burden in Latvia was 8.4% (Eurostat, 2018); nevertheless, realistic calculations (using Formula 3) reveal that the VAT burden varies depending on income levels (see Table 1). Thereby, the calculation shows a regressive consumption tax burden.

From the calculation of consumption tax burden can also determine the income (I_{CT}) which would have each

quintile group after consumption taxes (see Table 1), assuming no income taxes would be applied.

The findings make possible to determine and compere income inequality before taxes (G) and after consumption taxes (G_C) by using classical formula for calculation of GINI coefficient.

Particularly, calculation (by using data from Table 1 column 'I') has result that GINI coefficient (G) in this case is 33.9 but calculation (by using data from Tab 1 column 'I_{CT}') has result that GINI coefficient after imposition of consumption taxes (G_C) is 34.7.

Finally, by using Equation 2 it can also be estimated the regressivity of consumption tax, or K_C coefficient, which is –0.86 in this situation. This indicates that consumption taxes are regressive and increase income inequality.

The study's findings, based on this method, show that consumption taxes have a significant impact on inequality. Governments have the option of using not only income taxes, but also consumption taxes as an effective tool to reduce income inequity in society.

4. Discussion

Changing taxes can reduce income inequality. This can be done with a progressive income tax or similar solution. For example, by increasing the non-taxable minimum or reducing the effective tax for persons with lower incomes, or by imposing progressive income tax on high-income persons. Another possibility – consumption taxes can be differentiated (VAT on essential goods, food, or at least certain foods, or increase the burden on luxury goods or other people more consumed by wealthy people), as well as other solutions (redistribute funds with benefits to the disadvantaged) or combine different solutions (Jurušs, 2016). Further studies would be needed to identify in which countries at some level of income inequality whose approach would be most effective.

According to the European Commission policy documents (EC, 2020), it is suggested an option that the tax burden be shifted from labour to consumption. It needs to be examined very carefully. Consumption taxes are regressive and an increase in the consumption tax burden can only further increase the overall tax burden and therefore income disparity. Therefore, instead of shifting the tax burden from labour to consumption, the best approach would be to redistribute or equalize the tax burden among people of various income levels.

It is essential to make sure that all possible behavioural effects are well measured before the tax system changes, and then to compare the benefits of differentiation with costs. Because the benefits of developing a tax system in a more appropriate way must exceed the costs of running a more complex system and compliance.

Tax evasion and non-compliance with regulatory functions exacerbate income inequality, namely the incorrect redistribution of public funds, such as the rescue of banks from bankruptcy in crisis rather than spending on social aid. Inequalities are exacerbated by illegal activities such as tax evasion, corruption, fraud, and others.

Adequate tax policies and effective administration therefore have a significant impact on income equality. While the primary function of taxes is fiscal, practice often focuses on another essential tax function – regulatory function. A country can influence the economy through tax policy if the free market is not able to function properly.

The tax burden on consumption might be differentiated, for example, by reducing the VAT rate on categories where the share of spending from total income is higher for low-income persons – such as food and other core needs. The VAT reduction on food would result in a decrease in government revenue. One possibility for compensating fiscal losses could be an increase in VAT on other goods or services. Another option for reducing economic disparity is to redistribute state budget revenues and provide greater social transfers and benefits to low-income persons (Jurušs, 2016). Since there are a wide variety of national inequalities among countries caused by different factors, specific studies are needed before deciding on changes in tax policy.

As in practice there are reduced VAT rates for different product groups in many countries, the method for assessing the regressivity of consumption taxes should be adjusted to consider in detail the consumption structure of each quintile group and the goods and services consumed by that group. Therefore, further research in this regard would also be needed.

Conclusions

Tax policy is the most effective tool to reduce inequality, therefore governments have the option to use one or another method or combine different solutions. Inequality can be alleviated not only by progressive direct taxation but also by regressive consumption taxes, which have a significant impact on inequality.

In order to create an optimal tax policy, to determine the regressivity of consumption taxes, the specific method based on the estimation principle of Kakwani coefficient can be used to evaluate the consumption tax impact. However, to determine the impact of consumption taxes, before it the consumption tax burden should be calculated for each of the group of quintiles.

In applying the method developed by the authors in the case of Latvia, the results show regressivity of consumption taxes – the persons with lower incomes spend the majority of their income on consumption, primarily food, whereas consumption declines in groups with higher incomes as a part of their income is spent on saving or investing rather than consumption.

To reduce inequality, a more equitable tax system must be created, which means reducing the regressivity of the tax burden. In many countries, the progressive income tax has been introduced, and in several countries, particularly with high tax rates, the emphasis of taxation

policy is placed on revenue reallocation. However, consumption taxes, in particular VAT, could be reduced for basic goods (food, medical products, etc.), which create the largest tax burden for lower income earners.

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