

PROGRESSIVITY VERSUS A FLAT TAX RATE IN COMBATING SOCIAL INEQUALITY?

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Abstract: *On the automatic stabilization capabilities of the progressive tax regimes much has been written and argued. Equally, the flat tax rate has often been indicated as a promoter and stimulator of business, but also as a factor for the perpetuation and widening of social inequalities. Therefore, the article reproduces some of the themes of previous articles trying to discern between the qualities and defects of the two types of taxation regimes: progressive or single quota. The empirical analysis on the data gathered for the EU28 countries following the two tax regimes is interesting and surprising and deserves further reflection. This analysis supports the results shown in the literature on progressive tax regimes, but equally points to a number of key tax elements that use the flat tax rate, investigating whether or not it acts as a regressive tax by its effect on the Gini coefficient.*

Key words: *automatic stabilization, EU28, social inequality.*

JEL classification: *H11, H24, E63, I38.*

1. Introduction

Regarding progressive quotas or regimes, it is often state their quality of support for the principles of fiscal equity, thus the contributions of those who earn income (or in the case of companies, profit) increasing with revenues or profits made. Proportional quotas or single rates (or flat tax rates) consider a fairly equal position in the face of taxes irrespective of the level of income or profit achieved. This flat tax rate is currently used only in 7 EU28 countries: Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Hungary and Romania. Baltic countries such as Estonia, Latvia and Lithuania have been using this regime since the early 1990s and Romania since 2005. The relatively long period since the start of the flat tax rate implementation so far can outline any potential stabilizing or less stabilizing effects in the economy.

Therefore, a series of questions arise about the two types of tax regimes: What were the desired effects? Was desired a transition from equity to efficiency or vice versa? Was desired a tax regime designed to support social equality? Looking at the Central and Eastern European countries, part of the responses may naturally come from the analysis of the surprisingly large emigration of the young people able to work from these countries. Another part of the answers can also come through investigating the idea of delayed social equity, initially materializing in the support of businesses through reduced rates of corporate income tax and flat income tax rates. Theoretically, they should allow accumulations of capitals that, by investing, to be subsequently job generators and, ultimately, social equilibrium and social equity generators.

The lack of an integrated system of global income taxation has often made the approach towards progressive quotas less wanted for some policy makers and therefore the use of the flat tax rate has become the most attractive option. But the flat tax rate usually has widened the social gap in each and every country that has used this regime. Equally, this type of tax regime may have contributed to increasing the gap between the (still underdeveloped) eastern and western European continent. So the eastern Europe countries opted generally for the flat tax rate, while the western Europe countries opted for the progressive quotas.

An interesting discussion is whether flat tax rate acts as a regressive tax. We recall that a regressive tax imposes a higher tax burden on the poor, with lower incomes, in favor of the population with higher incomes or wealth. This, theoretically, allows an

accumulation of capital, to add more to their wealth by acquiring additional luxury products, buying new shares, saving and investing more. But if this does not happen in the formula desired by the fiscal-budgetary decision-makers, the phenomenon can be translated into a poor administration: the lack of fiscal effectiveness and, moreover, social inequality.

Therefore, generally a regressive tax rate is aimed at a higher range of low-income people. Regressive rates are seldom used for revenue taxation, but are primarily aimed at managing and directing consumption, generally being used as taxes on sales of goods and services. Just to be less regressive, they even seek to avoid taxing basic commodities such as food, housing, medical services and medicines etc. Excise duties are a concrete example of a regressive tax acting as a tax imposed on each item sold and which may affect the poorest population as far as it often uses those products subject to excise duty. As poor population is more vicious by using alcohol, gambling, tobacco and other harmful products subject to excise, the greater is the social inequality. On the other hand, gasoline excise duties and import tariffs (except in the case of free trade agreements) and the consumer tax called value added tax can not be avoided by anyone, regardless of whether the majority population in a country is predominant poor or rich, or whether it is vicious or less vicious.

In order to avoid the potential exhaustion of resources and to better protect the environment, some countries resort to an increase of the excise duty on fossil fuels. This approach, in addition to consumers and public outrage, does not solve the environmental problem, risking an avalanche of other adverse effects from rising inflation and ending with the emergence of social and political crises. Solutions to environmental issues should not only be fiscal, but should first of all start from contingent on negative effects by reforestation, promoting green cities, green cars and green industries. Also, in addition, in the idea of a more judicious management of resources and social equity, we can hypothesize that if the trade deficit is significantly in a country, this aspect certainly affects the welfare of the population and can lead to the deepening of the social inequalities.

Taking these issues into account, there is a tendency for translation from higher taxation of income and profits to higher consumption taxation, i.e. a shift from direct taxation to indirect taxation, while pursuing fiscal simplification. This approach is also found in the idea of a flat tax rate of the population income. However, due to its effect on lowering social equity, low-income people supporting a higher tax burden, it is interesting to investigate whether the single tax really acts as a regressive tax. Therefore, the article investigates this progressive-regressive dilemma from the perspective of equity in EU28 countries, knowing that a regressive tax increases social inequality and a progressive tax reduces it.

2. Description of the Problem and Literature Overview

The international and regional literature on the progressive tax is quite vast, but it cannot be said the same about the flat tax rate impact on inequality. The simulation is the main method of the most studies, and they start usually with the assumption of budget revenue neutrality. Only few studies (e.g. Davies and Hoy, 2002 - for the hypothetical case of United States; Chipman, 2004 - for the hypothetical case of Australia, Mihăilă, N., 2010, for the Romania) regard the flat tax rate as capable of reducing inequalities and that the flat tax rate is more simplified, more transparent, a much fairer and more efficient system and that can attract foreign investments due to the competitiveness of the taxation rate.

In the present, personal income tax (PIT) structures have lower top statutory marginal tax rates, fewer tax brackets and reduced complexity than 25 years ago, shifting slightly towards flat rate income taxes (Sabirianova Peter, Buttrick and Duncan, 2010).

Also, in Duncan and Sabirianova Peter (2012) empirical study, it is shown that progressivity reduces observed inequality in reported gross and net income and it has a smaller impact on inequality in consumption. They find also that progressivity changes at the top of the tax schedule are more effective in reducing income inequality than progressivity changes at the bottom and that progressivity has a larger negative effect on net income inequality than on gross income inequality.

In Voinea and Mihăescu (2009) study, there is analysed the flat tax impact on inequality in Romania comparing the year 2005 against 2004. They found that, the higher the number of dependents are, the lower the flat tax gains are and the higher the gross wage is, the higher the flat tax gains are. Also, the inequality indicators calculated by the authors show that the flat tax determines an increase in inequality, also reflected in Lorenz curve which reflected that the richest 20% of the population appears as the clear winners of the flat tax system. At the same time, they found that most of the flat tax gains (on average 74%) were spent, instead of saved. Finally, Voinea and Mihăescu (2009) recommend the replacement of the flat tax with a progressive tax, with two or three brackets, with large differences between them, serving for decreasing inequality and for automatic stabilization for prices and profits.

3. Data Sources and Methodology

Resuming a series of issues and notations present in other previous personal articles, the paper aims to investigate whether the flat tax leads or not to the increase of social inequality, thus whether or not it acts as a regressive tax. Using Eurostat data to quantify revenue inequality, we used the Gini coefficient of equivalent disposable income. At the same time, the article aims to highlight whether a progressive tax regime contributes to greater social equity.

To become more specific, for progressivity, only data on countries with a tax regime with 5 and more than 5 personal income tax brackets were used. The analysis period is 2007-2017 for both, progressive and flat tax rate countries. Econometric processing uses statistics from the European Commission and Eurostat. The correlations relate to elements such as: NoB - number of brackets (thresholds), TSPITR (%) – top statutory personal income tax rate and TSCITR (%) – top statutory corporate income tax rate, TGGR (% GDP) - the share of total general government revenues in GDP, TGGE (% GDP) - share of total general government expenditure in GDP, VIPI - Volume index of production (Mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply, unadjusted data, Index, 2015=100), FCEH (% GDP) - Final consumption expenditure of households and non-profit institutions serving households (GDP), UR3YA (%) - Unemployment rate - 3 year average, TB (mil.Euro) - Trade balance in million ECU/EURO and Gini coefficient of equivalised disposable income - EU-SILC survey, which should capture the issue of social inequality.

It should be noted that the results should be interpreted with caution because the systematization at the level of the groups of states (e.g. the group of progressive and flat tax rate countries) allows a high degree of heterogeneity of information.

4. Results Obtained

Starting the analysis from of systematization of data and the elaboration of correlation matrices on the one hand for countries with progressive taxation of personal income, and on the one hand for flat tax rates countries, we can select, in order to better highlight the effects of progressiveness, only countries with 5 and more than 5 personal income tax brackets. These countries are Belgium, Spain, France, Italy, Cyprus, Luxembourg, Malta, Austria, Portugal, Slovenia and Finland. With regard to Figure no. 1,

we note that there is a slight upward trend in the top personal income tax rate - TSPITR for these countries, which confirms the theory that progressive taxation, although relatively modest, reduces social inequality. Element reinforced by the evolution, also still modest, of the correlation between the number of thresholds (NoB) and the evolution of the Gini coefficient (see Table no.1).

Table no. 1. The correlation matrix of elements selected for a series of EU28 countries (Belgium, Spain, France, Italy, Cyprus, Luxembourg, Malta, Austria, Portugal, Slovenia and Finland) with five and more than five personal income tax brackets for the 2007-2017 period

| | <i>RGDPGR (%)</i> | <i>Gini coef</i> | <i>TSPITR (%)</i> | <i>TSCIT R (%)</i> | <i>TGGR (%GDP)</i> | <i>TGGE (%GDP)</i> | <i>VIPI</i> | <i>FCEH (%GDP)</i> | <i>UR3YA (%)</i> | <i>TB (mil. EUR O)</i> | <i>NoB</i> |
|---------------|-------------------|------------------|-------------------|--------------------|--------------------|--------------------|-------------|--------------------|------------------|------------------------|------------|
| RGDPGR (%) | 1 | | | | | | | | | | |
| Gini coef | -0.16 | 1 | | | | | | | | | |
| TSPITR (%) | -0.17 | -0.06 | 1 | | | | | | | | |
| TSCITR (%) | 0.08 | 0.12 | 0.34 | 1 | | | | | | | |
| TGGR (%GDP) | -0.10 | -0.42 | 0.68 | 0.26 | 1 | | | | | | |
| TGGE (%GDP) | -0.38 | -0.22 | 0.72 | 0.24 | 0.83 | 1 | | | | | |
| VIPI | 0.24 | 0.12 | -0.37 | -0.30 | -0.21 | -0.37 | 1 | | | | |
| FCEH (%GDP) | -0.25 | 0.43 | -0.05 | -0.27 | -0.22 | 0.08 | 0.21 | 1 | | | |
| UR3YA(%) | -0.14 | 0.62 | 0.24 | 0.02 | -0.27 | 0.00 | -0.15 | 0.42 | 1 | | |
| TB(mil. EURO) | 0.03 | -0.28 | 0.00 | -0.25 | 0.02 | -0.12 | -0.16 | -0.06 | -0.20 | 1 | |
| NoB | 0.10 | -0.13 | -0.03 | -0.01 | 0.05 | -0.17 | -0.18 | -0.75 | -0.40 | 0.10 | 1 |

Source: Eurostat data and the European Commission (2018), author's processing and conception.

Notes: RGDPGR (%) - real GDP growth rate, Gini coef – Gini coefficient of equivalised disposable income - EU-SILC survey, TSPITR(%) - Top statutory personal income tax rates (including surcharges), TSCITR (%) - Top statutory corporate income tax rates (including surcharges), TGGR (% GDP) - the share of total general government revenues in GDP, TGGE (% GDP) - Total general budget expenditure (% of GDP), VIPI - Volume index of production (electricity, gas, steam and air conditioning supply, Unadjusted data, Index, 2015 = 100), FCEH (% GDP) - UR3YA (%) - Unemployment rate - 3 year average, TB (mil.Euro) - Trade balance in million ECU / EUR, NoB- number of brackets (thresholds) of personal income tax rate.

Noteworthy, given the downward trend in the top statutory corporate tax rate (TSCITR,%), both in progressive and flat tax rate countries, the positive correlation between TSCITR and the Gini coefficient reflects its contribution to reducing social inequality. If it is relatively normal and expected that the unemployment rate expressed as a three-year average (UR3YA, %) evolves in the same direction as the evolution of social inequality proving a relatively strong relation (0.62), not the same can be said about the volume of production index (VIPI) and final consumption expenditure of households and non-profit institutions serving households - FCEH (% of GDP). This would indicate that domestic production does not support as would normally should the reduction of social inequality, and household final consumption expenditure is not a limiting factor, but sometimes, of deepening the social inequality.

However, this analysis should be interpreted cautiously in the sense that, as a result of the global economic and financial crisis and other second-round crises and effects in the Western EU28 countries, both VIPIs and FCEHs have not evolved towards increasing in

all the states analyzed, and in this case the direct link to the Gini coefficient should be viewed positively, reducing social inequality.

Equally, with regard to the FCEH (%), the percentage of correlation with the Gini coefficient is much lower compared to the countries with flat tax rate on personal income.

Thus, returning to the countries with a flat tax rate on personal income, regarding Figure no. 1, we notice that in their case, the tendency for the evolution of TSPITR (%) (which in this case is the flat tax rate) is generally a reduction. This shows that the negative correlation between TSPITR (%) and the Gini coefficient (see Table no.2) actually contributes to increasing social inequality, reinforcing the possibility of a rather regressive effect of the single quota.

Table no. 2. Matrix of correlation between selected items for Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Hungary and Romania, with flat tax rate on personal income for 2007-2017 period

| | RGDPGR (%) | Gini coef | TSPITR (%) | TSCITR (%) | TGGR (%GDP) | TGGE (%GDP) | VIPI | FCEH (%GDP) | UR3YA (%) | TB (mil. EURO) |
|---------------|------------|-----------|------------|------------|-------------|-------------|-------|-------------|-----------|----------------|
| RGDPGR (%) | 1 | | | | | | | | | |
| Gini coef | 0.08 | 1 | | | | | | | | |
| TSPITR (%) | -0.07 | -0.27 | 1 | | | | | | | |
| TSCITR (%) | -0.12 | -0.62 | 0.49 | 1 | | | | | | |
| TGGR (%GDP) | -0.12 | -0.69 | 0.34 | 0.53 | 1 | | | | | |
| TGGE (%GDP) | -0.41 | -0.65 | 0.36 | 0.48 | 0.83 | 1 | | | | |
| VIPI | 0.56 | 0.12 | -0.21 | -0.30 | -0.04 | -0.38 | 1 | | | |
| FCEH (%GDP) | 0.00 | 0.80 | -0.20 | -0.72 | -0.71 | -0.50 | -0.03 | 1 | | |
| UR3YA (%) | 0.05 | 0.31 | 0.08 | -0.21 | -0.07 | 0.00 | -0.03 | 0.28 | 1 | |
| TB(mil. EURO) | -0.16 | -0.74 | 0.06 | 0.41 | 0.64 | 0.50 | 0.14 | -0.76 | -0.07 | 1 |

Source: Eurostat data and the European Commission (2018), author's processing and conception.

Notes: RGDPGR (%) - real GDP growth rate, Gini coef – Gini coefficient of equivalised disposable income - EU-SILC survey, TSPITR(%) - Top statutory personal income tax rates (including surcharges), TSCITR (%) - Top statutory corporate income tax rates (including surcharges), TGGR (% GDP) - the share of total general government revenues in GDP, TGGE (% GDP) - Total general budget expenditure (% of GDP), VIPI - Volume index of production (electricity, gas, steam and air conditioning supply, Unadjusted data, Index, 2015 = 100), FCEH (% GDP) - UR3YA (%) - Unemployment rate - 3 year average, TB (mil.Euro) - Trade balance in million ECU / EUR, NoB- number of brackets (thresholds) of personal income tax rate.

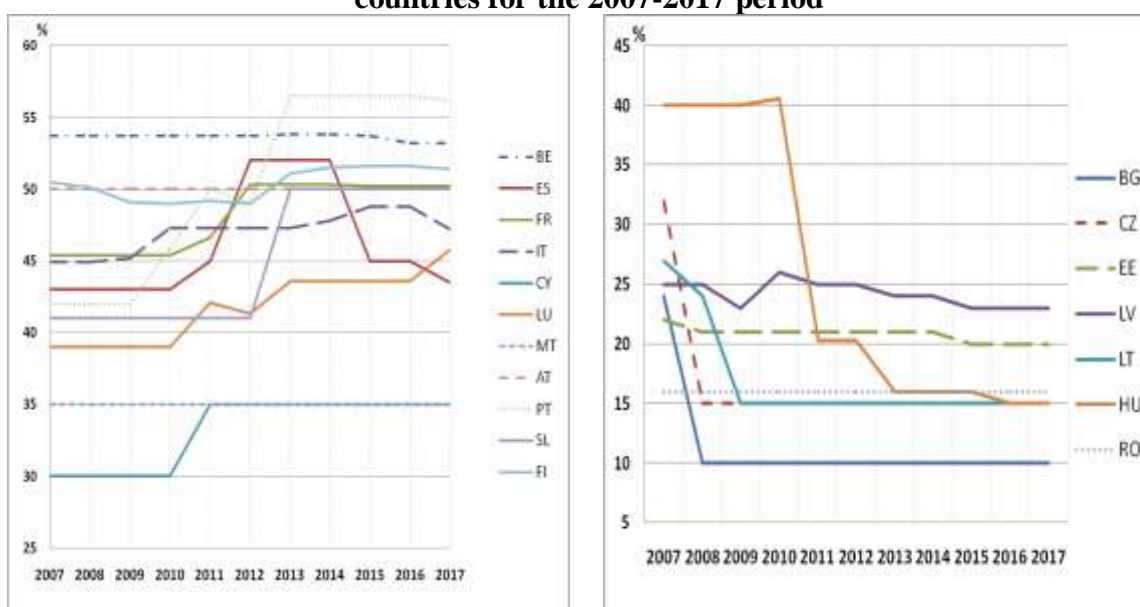
The aspect is also reinforced by the relatively strong negative correlation between TSCITR (%) and Gini coefficient, with a TSCITR (%) downward trend observed in the group of analyzed countries. At the same time, the positive correlation with the unemployment rate expressed as a three-year average (UR3YA (%)) although it is normal to evolve in the same sense as the Gini coefficient, yet the percentage is only half compared to the similar percentage for the countries with a progressive tax regime, thus the unemployment rate expressed as an average of three years is not a major determinant of reducing or increasing social inequality.

Referitor la Indicele volumului producției (VIPI), tendința acestuia este vădit de creștere la nivelul tuturor statelor cu cotă unică privind impozitul pe venit personal, aspect care ar indica că producția internă nu susține așa cum ar fi normal reducerea inegalității

sociale. În privința cheltuielilor de consum final ale gospodăriilor FCEH (%), evoluția acestora agregată la nivelul acestui grup de țări cu cotă unică indică mai degrabă o tendință de reducere, ceea ce ar indica mai degrabă un efect direct, pozitiv și puternic (0,80) în raport cu reducerea inegalității sociale.

Regarding the Volume index of production (VIPI), it is obvious the growth trend for all the states with flat tax rate on personal income, which would indicate that domestic production does not support the reduction of social inequality. Concerning final consumption expenditures of households FCEH (%), their aggregate evolution in this group of countries with flat tax rate on personal income indicates rather a downward trend, which would suggest a direct, positive and strong effect (0.80) in terms of reducing social inequality.

Figure no. 1. TSPITR (%) for a series of EU28 countries with five and more than five personal income tax brackets and for flat tax rate on personal income countries for the 2007-2017 period



Source: data from European Commission (2018), author's processing and conception. Note: TSPITR(%) for Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Hungary and Romania is of course the flat tax rate

For flat tax rate countries, the regression equation expressed in a simplified form is: Gini coef = f (TSPITR, TSCITR) (see Table no.3). Analyzing the value of the determination coefficient or R2, which is used to measure the intensity of the correlation between the endogenous variable and its determinants, it is noticed that the value of 0.389 is not very good. At the same time, with respect to adjusted R2, it is equal to 0.373 in the sample with 77 observations, suggesting that there is not a very strong correlation between the variables in the model.

It can be seen that, based on the results in Table no. 3, for TSPITR (%), which is actually the flat tax rate, the coefficient is not significantly different from zero, at the same time this indicator has an associated probability or a p-value well above 0.05. Only TSCITR (%) has a p-value probability far below 0.05, more precisely of 3.02825988860478E-08, which confirms that only this is significant in the total statistical population and that only for this indicator, the null H0 hypothesis is rejected.

Thus, for the TSCITR (%) the model was correctly specified, identified and evaluated, and therefore, it can be considered that the influence on the dependent variable

(Gini coefficient) comes only from this factor. This result, although for better substantiation requires additional elements of analysis, reflects, however, the rather indirect and regressive aspect of the profit tax (we recall that during the analysis period the trend of the TSCIR (%) was rather declining and therefore the negative correlation with the Gini coefficient would indicate an increase of that).

Table no. 3. The result of the regression equation for the relation between Gini coefficient, TSPITR (%) and TSCITR (%) for Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Hungary and Romania with a regime of flat tax rate on personal income for the 2007-2017 period

| <i>Regression Statistics</i> | |
|------------------------------|-------|
| Multiple R | 0.624 |
| R Square | 0.389 |
| Adjusted R Square | 0.373 |
| Standard Error | 3.538 |
| Observations | 77 |

| ANOVA | | | | | |
|------------|-----------|-----------|-----------|----------|-----------------------|
| | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i> | <i>Significance F</i> |
| Regression | 2 | 590.365 | 295.183 | 23.584 | 0.000 |
| Residual | 74 | 926.216 | 12.516 | | |
| Total | 76 | 1516.581 | | | |

| | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> | <i>Lower 95%</i> | <i>Upper 95%</i> | <i>Lower 95.0%</i> | <i>Upper 95.0%</i> |
|------------|---------------------|-----------------------|---------------|----------------|------------------|------------------|--------------------|--------------------|
| Intercept | 44.478 | 1.856 | 23.964 | 0.000 | 40.780 | 48.177 | 40.780 | 48.177 |
| TSPITR (%) | 0.027 | 0.067 | 0.409 | 0.684 | -0.105 | 0.160 | -0.105 | 0.160 |
| TSCITR (%) | -0.759 | 0.123 | -6.192 | 0.000 | -1.004 | -0.515 | -1.004 | -0.515 |

Source: Eurostat data and the European Commission (2018), author's processing and conception.
Notes: Gini Coef - Gini coefficient of equivalised disposable income, TSPITR(%) - Top statutory personal income tax rates (including surcharges), TSCITR (%) - Top statutory corporate income tax rates (including surcharges).

5. Conclusions

Literature mentions and demonstrates the qualities of progressive tax rates both in terms of better automatic stabilization and in reducing social inequalities. This is less relevant in the case of countries with single or proportional tax regimes. Therefore, the article investigates econometrically for 2007-2017 period, the link between social inequalities and a series of macroeconomic and fiscal indicators (top personal income tax rate and top corporate tax rate). The data used are from Eurostat and the European Commission.

In order to better capture progressivity, we only analyzed the states with and over five brackets of personal income tax, and in the case of regression, hypothetically, we associate the seven countries of the EU28 with a flat personal income tax rate with the countries with regressive fiscal effect. With 121 statistical observations for countries with

progressive quotas and 77 statistical observations for flat tax rate countries using a panel-based systematization, the results can be considered credible.

The results, albeit modest in terms of intensity, confirm the theoretical hypotheses of the literature, the increase of progressivity being negatively correlated with the social inequality and positively correlated with the economic growth rate. With regard to the flat tax rate, the results confirm the hypothesis of a rather unfavorable effect in terms of social equality. Although it is assumed that the effect of corporate tax rate comes to reinforce the positive effects of personal income tax rate, in the case of flat tax rate countries it is rather to strengthen the negative effects of personal income tax on social equity, outlining the necessity and opportunity of some revision of the tax system in these countries.

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