CAN PROGRESSIVE TAXATION CONTRIBUTE TO HUMAN DEVELOPMENT?

Marcus-Radu Man[1], Sorana Vătavu[2*]
[1),2)] *West University of Timisoara, Timisoara, Romania*

Abstract
This paper aims to understand and quantify the impact of taxation on the Human Development Index. The countries considered for this research are members of the European Union and the period overviewed is 2011-2019. According to the computation of the data relevant to this research, progressively taxed countries have a higher Human Development Index than the ones that practice a flat tax system. Subsequently, the income tax as a share of GDP is also at a much higher rate in progressively taxed countries than in flat-taxed countries. Additionally, countries in the European Union that have a progressive taxed system also collect more taxes as a share of GDP than the countries that have a flat tax system. Ultimately, this paper aims to reinforce the need for the European Union's member states that do not have a progressive taxed system to transition to one in order to have a fairer tax system that leads to a higher value of the Human Development Index and higher governmental revenues.

Keywords
taxation, flat tax, progressive tax, Human Development Index, income tax

JEL Classification
C23, H2, O15.

Introduction

The aim of this research paper is to compare the two ways of taxing the personal income, flat tax and progressive tax, and argue through empirical date which one would be better for increasing the Human Development Index (HDI). Additionally, this paper used a novel way of quantifying the Human Development Index by arguing that taxation is directly impacting the HDI value. This paper employs the use of a multiple linear regression, arguing how six independent variables related to public revenues impact the human development in EU countries.

According to Simpson (2002), the earliest forms of taxation come from a fuzzy past of ancient empires. Inadequate records of the past make it almost impossible to pinpoint the exact moment when taxation was first introduced. The Egyptian Empire, the

* Corresponding author, **Sorana Vătavu** – sorana.vatavu@e-uvt.ro

Mesopotamian Empire and the Chinese Empire are believed to be the first to introduce taxation as a concept. In modern times, having a fair tax burden distribution among the population has been a pivotal problem to be solved by policymakers. Social welfare should be maximized through a proper tax system while considering that social welfare is greater when resources are equally distributed. Still, transfers and redistribution of taxes can negatively affect the desire and necessity for savings and working. Therefore, it creates and enlarges the discrepancy (trade-off) between efficiency and equity. In this regard, the earnings of low-income individuals should be taxed at a much lower rate, since it can impact the decision of one's participation in the labour market, while the revenues of high earners should be taxed at a considerably higher rate (Belsey, 2013).

The income effect and the substitution effect are the starting point. The disposable income of individuals decreases as taxes are higher (the power of purchase of earners decreases as citizens purchase less) and this "loss" of power of purchase can be lessened or completely erased by working more hours. The situation of the poorest of individuals in a society is being helped by improving the benefits of social insurance, this being financed by progressive taxation. Furthermore, the tax system must be impartial. This means that all members of society must be treated equally, whether poor or rich. Moreover, a properly functioning tax system should be thorough and very easy to implement (Popescu et al., 2019). For example, there must be a clear specification of what is being taxed in the 'income tax' (such as employment income, trading income, property income, etc.). Additionally, flexibility and stability are very important characteristics of a well-functioning tax system. For economic reasons, stability is needed, while for political reasons, flexibility is crucial. European Union (EU) member states employ various tax systems, being different in many ways. The highly developed countries in the EU employ a progressive tax system in order to shift the tax burden from low-income earners to high-income earners. In a progressively taxed system, the brackets of taxation are settled for different income levels (for example, a tax of 20% for the first 10,000 euros earned and, afterwards, a 40% tax on income for any additional 10,000 euros). Usually, when revenues increase, so does the economy, and a certain amount of that is returned to the state through income tax. There are two advantages when this happens: it reduces the public deficit and limits the aggregated demand increase. As presented above, a progressive tax is more present in developed nations (in the case of the EU), while a flat tax system has been introduced in emerging economies such as Romania, Bulgaria, Estonia, and Hungary. The benefits of a flat tax system can be settled down to one reason, i.e., simplicity, which was emphasized as the main argument when the tax system was introduced in Central and Eastern European countries between 1990 and 2005. Although it was introduced a while ago, there are still proposals for changing from a flat tax system to a progressive one due to the rampant inequality increase that Eastern European countries face (Barrios et al., 2019).

The following section, "Review of the scientific literature", covers previous publications that deal with the purpose and the trend of the increase in taxation as a share of GDP. The "Methodology" and "Research data" sections deal with the authors' computation of the data collected, showcasing the trends in the evolution of the HDI, and all the components of taxation that were being taken into consideration for this paper. Moreover, this section

is continued by the results from the linear regression models and several observations on the influences indicated. Lastly, the "Conclusion" section encompasses the outline of this research, specifically how progressive-taxed countries have a higher HDI compared to flat-taxed countries.

1. Review of the scientific literature

As stated by Besley (2013) the ability to tax and the variety of tax forms that can be implemented are heavily dependent on the following: the nature of the economy (including its structural characteristics). The economic point of view of developments and taxation's focus point is how the evolution of tax systems is being affected by economic instability. In this regard, the structural change reflects a shift in the tax system. One such example is how the tax net is widened by a reduction in the informal sector. Large firms grow and thus create a compliance chamber where the expansion of the financial sector demands an accounting system that is very transparent in order to facilitate taxation.

The approach in standard economics looks at how the economy is being influenced by a particular tax system. The efficiency loss created by taxes can be minimized and even raised by a well put together tax system. Both individuals' and businesses' reactions are affected by a lower rate of income tax (because of the income and substitution effects). Working, saving, and investing are rewarded by a lower tax rate, thus increasing the spending power of individuals. Tax cuts, usually, have this purpose. One more benefit of tax cuts is the reduction of existing fluctuations in the tax amount, causing an efficiency-improving change in the make-up of the economic activity further away from sectors that have a favourable tax such as the health sector or the housing sector. Additionally, rate cuts also create a surge in the disposable income of earners which might reduce the need and desire of taxpayers to invest or work.

Nations, throughout the years, have become more and more capable of extracting revenues from the population through various means. One such example was emphasized by Maddison (2001), in 1910, for countries such as France, Germany, and the Netherlands, which raised only 12% of their GDP in taxes, this percentage growing to 46% by the beginning of 2000. This "success" has been attributed to 'tax innovations' such as creating tax brackets for high-income earners, i.e. those who earn more and pay higher taxes. In general, EU member countries collect most of their tax revenues through personal income tax, corporate income tax, consumption taxes and social contributions. And there is a tendency to compensate the level of direct taxation with the indirect one so that, for example, when labour taxes are decreased then consumption taxes increase (Vatavu et al, 2019). Governments may use fiscal policies to sustain economic growth and well-being of their citizens, as previous research already evidenced a direct relationship between high fiscal pressure and economic development, and also citizens' willingness to support higher taxes when there is evidence for equity and a decent standard of living for all social strata (Tanzi and Zee, 2000; Li and Sarte, 2003; Wojciechowska−Toruńska, 2017; Vatavu et al, 2019).

2. Research methodology

We have started on the premise that taxation has a direct and positive impact on the value of the Human Development Index, because if governments collect more revenue, they can spend more on social protection measures, which would rise the HDI. For this paper, we chose a quantitative approach, the data being collected from the Eurostat and the United Nations database, over a period of nine years (2011-2019), on an annual basis. First, we evidence the evolution of the data collected, through descriptive statistics, and after we focus on econometric analysis.

For the analysis, we employed simple and multiple linear regression models (the ordinary least square – OLS model), in order to determine the influential factors for human development. The equations and models will be further explained in the "Regression results and discussions" section.

The variables taken into consideration are the following: for the dependent variable we considered the Human Development Index, while the independent ones were, in turn, governmental revenues, income tax, corporation tax, VAT, taxes and duties on imports, and net social contribution, all evaluated as share of GDP.

Research data

In this section, we overview the evolution of the following indicators: Human Development Index (HDI), governmental revenues, income tax, tax on corporate profits, value added tax (VAT), taxes and duties on imports and net social contribution. Except for the first indicator, which is an index without dimension, the rest of the indicators are expressed in % of GDP. The data were collected over the period 2011-2019, on an annual basis. After acknowledging the main results from the previous research available in the scientific literature, we decided to overview our data based on two categories of countries from the EU: flat-taxed countries, from which we mention Bulgaria, Estonia, Hungary and Romania, and progressive taxed countries, from the rest of the EU member states.

Table no. 1: Evolution of average data at the level of EU (2011 vs. 2019)

	Flat taxed countries		Progressive taxed countries	
Indicators \ Countries	Bulgaria, Estonia, Hungary, Romania		Austria, Belgium, Croatia, Cyprus, Czechia, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden	
(average values)	2011	2019	2011	2019
HDI	0.82	0.84	0.87	0.9
Governmental revenue (% of GDP)	37.1	38.17	42.93	43.71
Income tax (% of GDP)	5.62	5.97	10.64	11.65
Corporation tax (% of GDP)	1.6	1.82	2.66	2.97
VAT (% of GDP)	8.37	8.47	7.45	7.81
Taxes and duties on imports (% of GDP)	1.31	1.22	0.68	0.59
Net social contribution (% of GDP)	10.12	10.95	11.67	11.85

Data source: own computation, data retrived from the United Nations and Eurostat databases

As observed in Table 1, both type of countries had a higher HDI in 2019 than in 2011. In the case of governmental revenues, the same progression can be observed. For flat-taxed countries the increase was of 1.07%, from 37.1% in 2011 to 38.17% in 2019. For progressive-taxed countries the increase was 0.78% from 42.93% in 2011 to 43.71% in 2019. The only variable that has not increased is the taxes and duties on imports which decreased by 0.09% for both flat-taxed and progressive-taxed countries.

Next, we observed the evolution of each indicator throughout the nine years analyzed, for every EU member state, through the graphics presented in figures 1-7. From figure 1 it is obvious that the lowest values of the human development index are registered by some of the flat-taxed countries (Bulgaria, Romania and Hungary). Estonia, although with a flat tax promoted, is situated close to the average HDI at the EU level. As a general trend, all EU member states had an increase in the HDI from 2011 until 2019, but Ireland had the highest increase, being in the last year analyzed (2019) the top country in terms of human development level, closely followed by Germany, Sweden, the Netherlands, Denmark, and Finland.

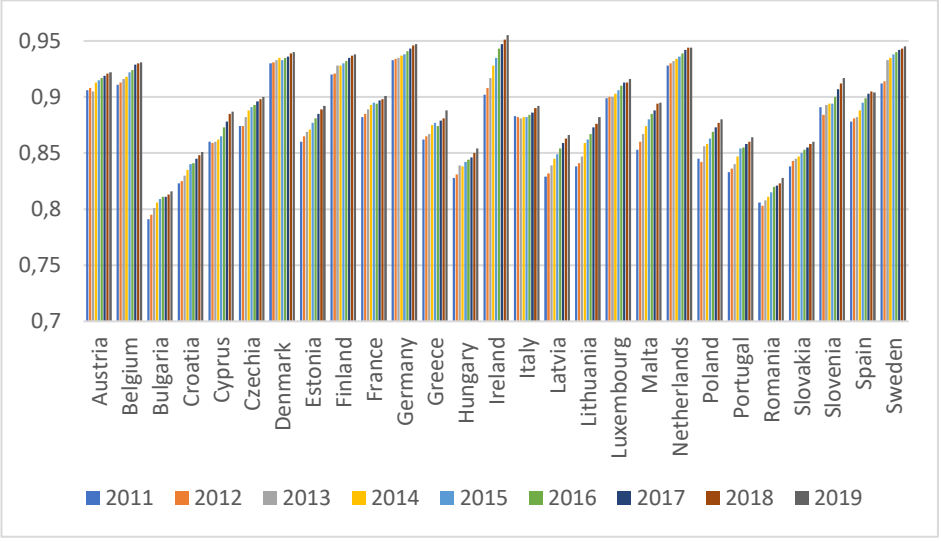

Figure no. 1: Evolution of the Human Development Index
Data source: United Nations database

From figure 2 we observe, once again, that flat-taxed countries (especially Romania, Bulgaria and Estonia) are situated among the EU countries with the lowest levels of governmental revenues. However, we emphasize that although Ireland had the highest HDI in 2019, it is at the bottom of the ranking in terms of governmental revenues as % in GDP in 2019. In addition, Ireland had the most significant dropout of all EU, falling from

33.6% in GDP in 2011 to 24.7% in GDP in 2019. However, there was significant fluctuation in the level of governmental revenues in all EU countries, and we cannot evidence a significant common trend for these revenues.

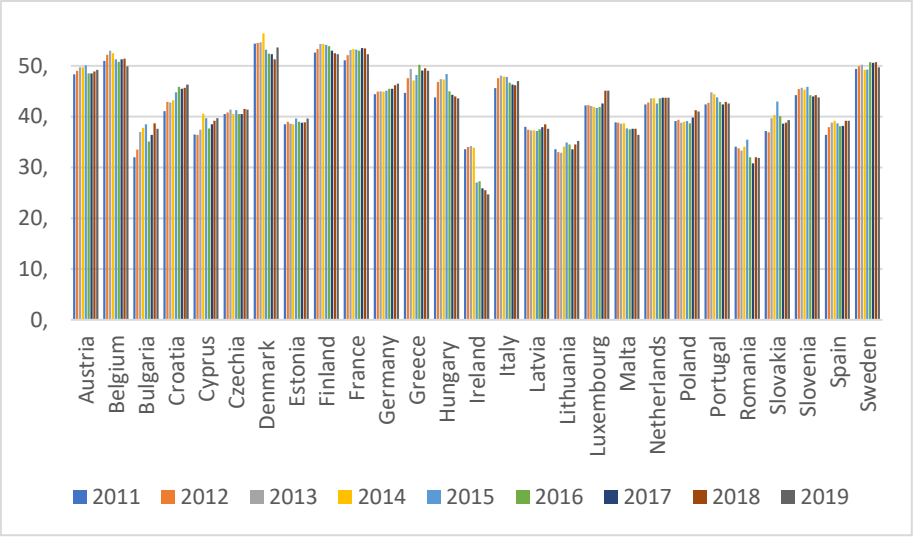

Figure no. 2: Evolution of governmental revenues (% of GDP)
Data source: Eurostat database

From figure 3 we observe a significant outlier in the case of Denmark, and even Sweden, having the highest levels of income tax in GDP, but very low social contributions, as evidenced in figure 7. Therefore, there is a trade-off between these two tax categories for Scandinavian countries. All the flat-taxed countries are at the bottom of the list if we classify EU countries based on the income tax levels in GDP. Hungary and Estonia are also among the last five countries of the EU when we consider the level of corporate taxation in GDP (as illustrated in figure 4). Then, except for Romania (which in 2019 was ranked 23), Hungary was placed 3rd, Bulgaria 5th and Estonia 8th when we consider the 2019 ranking in terms of VAT as % of GDP (illustrated in figure 5). Estonia is ranked first for collecting taxes and duties on imports and evidenced as an outlier from all EU member states, as emphasized through the graph presented in figure 6. Therefore, the tradeoff between direct and indirect taxation is emphasized by these trends, proving that countries with lower levels of taxes for corporate and income revenues tend to apply higher taxes on consumption through the value-added tax.

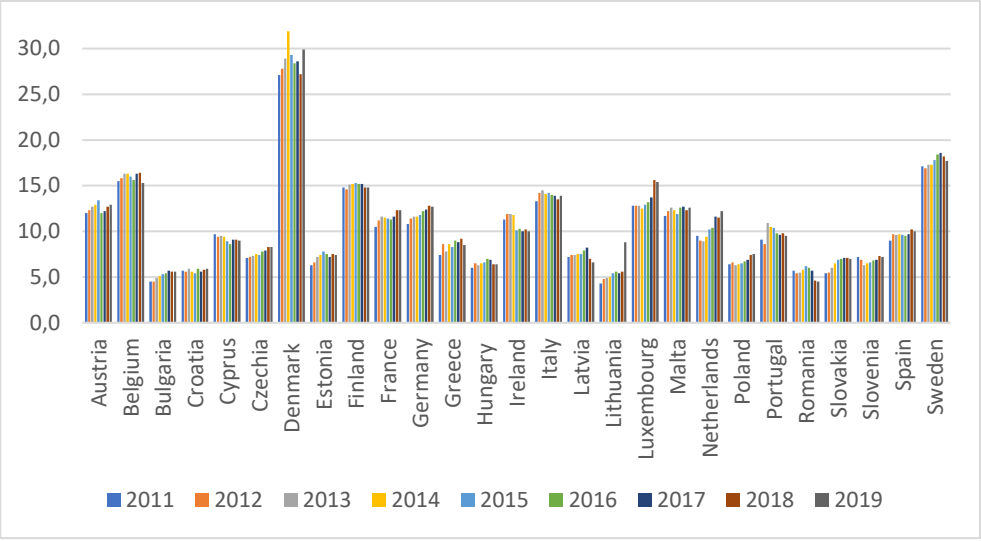

Figure no. 3: Evolution of income tax (% of GDP)

Data source: Eurostat database

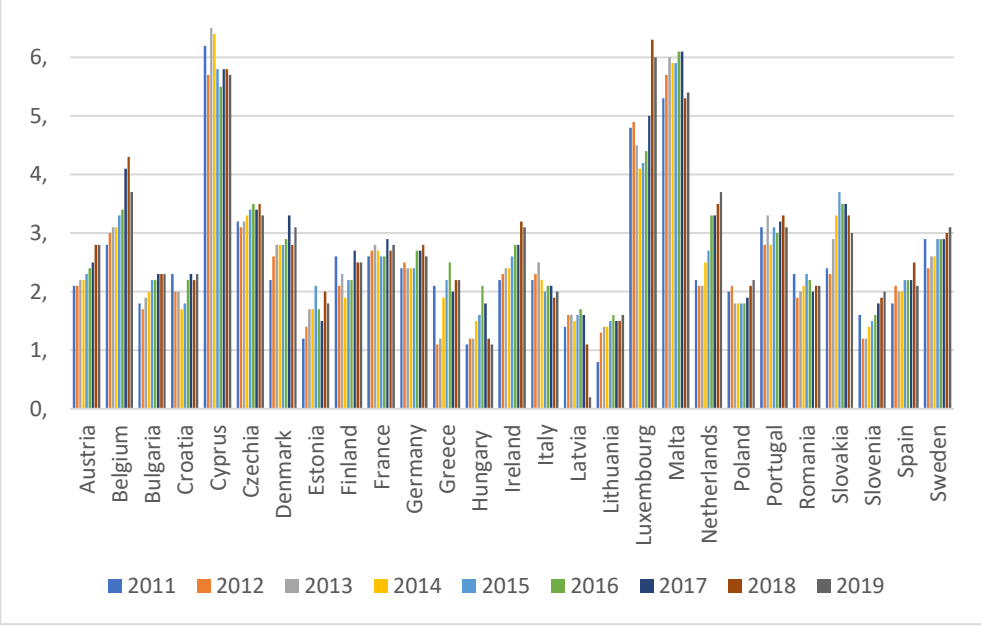

Figure no. 4: Evolution of corporate tax (% of GDP)

Data source: Eurostat database

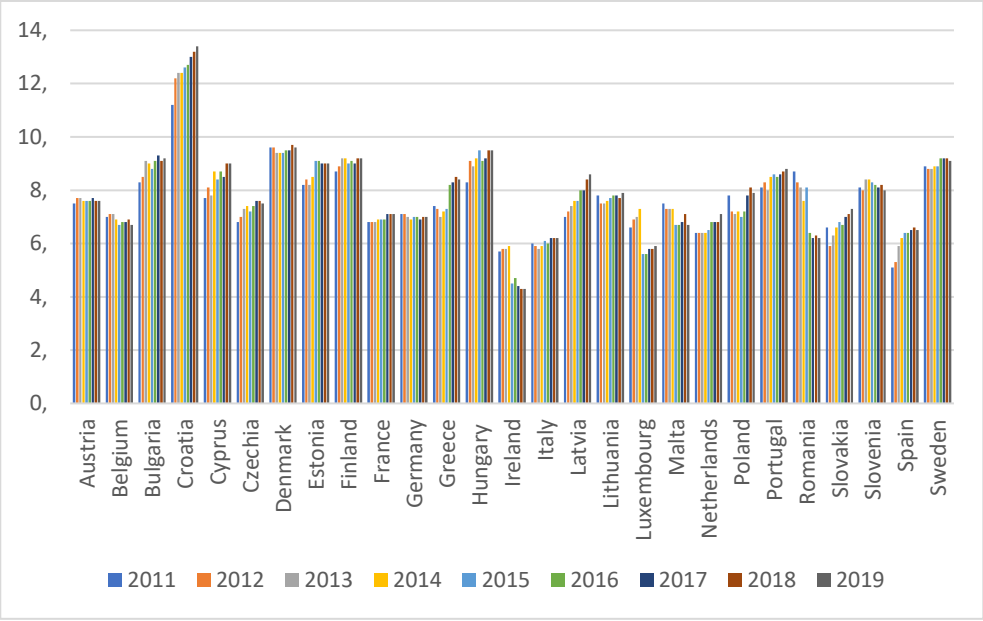

Figure no. 5: Evolution of VAT (% of GDP)

Data source: Eurostat database

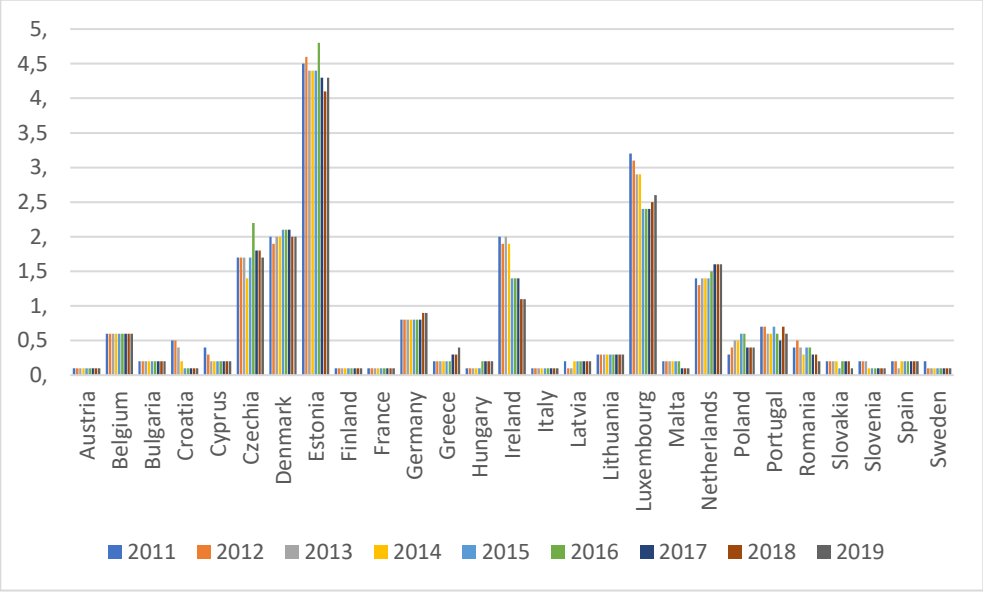

Figure no. 6: Evolution of taxes and duties on imports (% of GDP)

Data source: Eurostat database

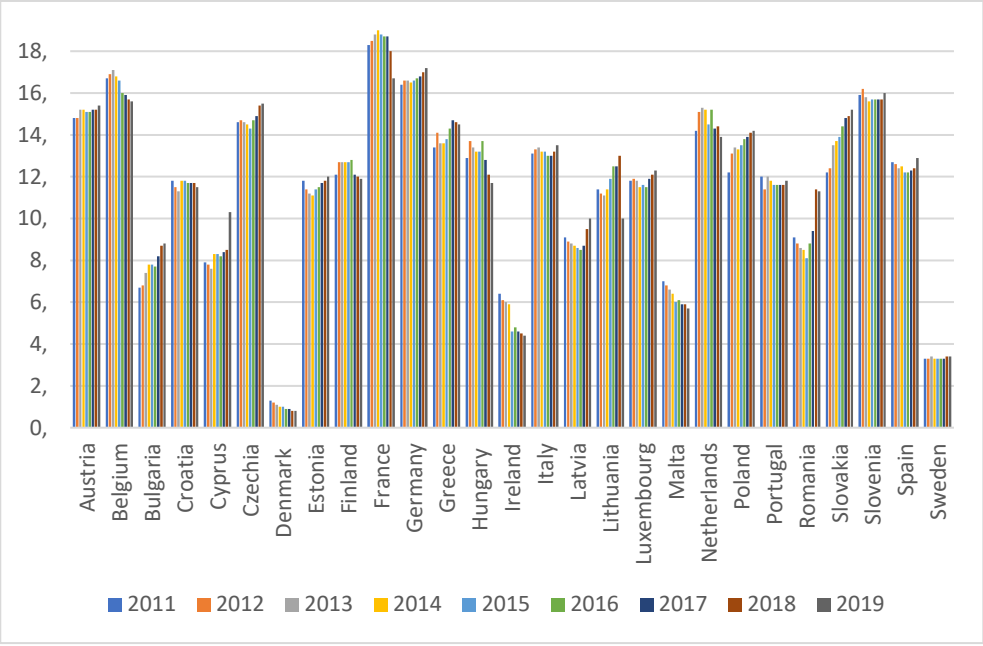

Figure no. 7: Evolution of social contributions (% of GDP)

Data source: Eurostat database

3. Results and discussion

Taking into consideration the statistical findings previously described, we decided to also apply a regression model with the following variables: Human Development Index (HDI) as the dependent variable; Governmental revenues (% of GDP), Income tax (% of GDP), Tax on corporate profits (% of GDP), VAT tax (% of GDP), Taxes and duties on imports (% of GDP), and Net social contribution (% of GDP) as independent variables. Therefore, we present the following formula for the general linear regression model:

$$Y = \alpha + \beta X1 + \gamma X2 + \delta X3 + \zeta X4 + \eta X5 + \theta X6 + \varepsilon \quad (1),$$

where

Y is the dependent variable, and

X1, X2, X3, X4, X5, X6 are the independent variables (governmental revenues – Gov.rev., Income tax – PIT, Tax on corporate profits– CIT, value added tax – VAT, Taxes and duties on imports – Imp., Net social contributions – Soc.contr.), α is the intercept or the constant, β is the regression coefficient or the slope of the first independent variable, and γ, δ, ζ, η, θ are the regression coefficients of each independent variable. Therefore, our model may be described in the following regression equation form:

$$HDI = \alpha + \beta\ Gov.rev. + \gamma\ PIT + \delta\ CIT + \zeta\ VAT + \eta\ Imp + \theta\ Soc.contr. + \varepsilon \quad (2),$$

where

ε (the error term) encloses the unobserved deviation of the HDI, as our model considers only six independent variables. Our database is comprised of annual data for the period 2011-2019. The countries considered in this analysis are members of the European Union.

Table no. 2: Regression results for the overall dataset

	OLS (1)	**OLS (2)**	**OLS (3)**	**OLS (4)**	**OLS (5)**	**OLS (6)**	**OLS (all indep. var.)**
Gov.rev.	0.0027*** (8.024)						-0.0013* (-1.7990)
PIT		0.0053*** (14.396)					0.0076*** (8.1780)
CIT			0.0066*** (3.2289)				-0.0005 (-0.3883)
VAT				-0.0071*** (-4.3951)			-0.0028* (-1.6701)
Imp.					0.0091*** (3.7551)		0.0038** (2.2069)
Soc.contr.						0.0002 (0.3659)	0.0042*** (4.8341)
Const.	0.7658***	0.8289***	0.8666***	0.9394***	0.8776***	0.8817***	0.8330***

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (all indep. var.)
							(59.6026)
R-squared	0.2108	0.4624	0.0415	0.0742	0.0552	0.0005	0.6225
F-stat.	64.38***	207.24***	10.426***	19.31***	14.1***	0.1339	64.82***

***, **, * - significant at 1%, 5% and 10% respectively; t-statistics in parenthesis
Data source: Author's own computation, data retrieved from Eurostat database

Table no. 3: Regression results for the countries with flat and progressive taxes

	OLS (flat-taxed countries)	OLS (progressive taxed countries)
Gov.rev.	-0.0012 (-1.118)	-0.0008*** (-1.1324)
PIT	0.0095** (2.704)	0.0059*** (5.7548)
CIT	-0.0014 (-0.2505)	-0.0023* (-1.6356)
VAT	0.0034 (1.038)	-0.0035** (-2.0802)
Imp.	0.0074*** (4.797)	0.0045* (1.6478)
Soc.contr.	0.0065*** (3.797)	0.0025*** (2.7806)
Const.	0.7181*** (34.385)	0.8646*** (58.808)

	OLS (flat-taxed countries)	**OLS (progressive taxed countries)**
R-squared	0.9366	0.5321
F-stat.	71.346***	37.91***

***, **, * - significant at 1%, 5% and 10% respectively; t-statistics in parenthesis

Data source: Author's own computation, data retrieved from Eurostat database

Based on the R-squared presented in table 2 (0.6225 for the regression model including all independent variables) and table 3 (0.9366 and 0.5321) we can clearly observe that the value for the dataset of the flat-taxed countries is much higher than the one for progressive taxed countries. Thus, we can state that the regression model employed in this research is much better suited for the countries that promote a flat tax than it is for the progressive taxed systems.

Examining the independent variables presented in table 2, we can observe that governmental revenues (Gov.rev.), corporate income tax (CIT), and VAT have a negative impact on the evolution of the Human Development Index, while the personal income tax (PIT), taxes and duties on imports (Imp.), and social contributions (Soc.contr.) have a positive effect on the human development. Observing the p-values of the independent variables, all of them are statistically significant (either in the simple linear regression or in the multiple linear regression model) given the fact that their levels were less than 0.1.

In table 3 we observe different coefficients for flat-taxed countries and progressive taxed countries. Considering the flat-taxed countries database, the corporate income tax and government revenues have a negative impact on the evolution of HDI, while the rest of the indicators (personal income tax, social contributions, VAT and taxes and duties from imports) carry a positive influence on human development. Given their p-value, governmental revenues, corporate tax and VAT are not statistically significant. However, for progressive taxed countries, all the indicators are statistically significant in relationship with the human development index (with p-values below 0.1). Governmental revenues, corporate income tax and VAT have a negative influence on the trend of the HDI, while the rest (personal income tax, social contributions and taxes and duties from imports) have a positive one. Based on the two sub-samples and the period analyzed results emphasized that human development is influenced by all types of taxes more in countries with progressive tax systems, while in flat-taxed systems, personal income tax, social contributions and taxes and duties from imports are influential for the human development index.

Our results have common points with those evidenced in the scientific literature. For example, the literature has already proved that developed countries are characterised by high taxes, and tend to have better human development indexes (Vatavu et al, 2019). However, previous research evidenced that, between fiscal revenues, social contributions

are most important for improving welfare and significantly influencing human development. Our study evidenced the influence of several types of taxes on human development, beyond the social contributions, also focusing on flat-taxed and progressive-taxed countries, ensuring a new perspective of evidencing the recent development of the society.

Conclusions

As seen throughout this paper, flat tax systems are usually being used by countries that have a much lower Human Development Index than the countries that have a progressive taxed system. For example, even if flat-taxed systems have advantages related to an easier way of applying and maintaining a properly functioning tax administration, it is not enough to offset the need for reform into a fairer tax system (e.g., a progressive tax system). Progressive taxed systems have the advantage of collecting more taxes by putting in place brackets of income. Thus, if a taxpayer earns more, he will pay a higher share of taxes on his income. One such example, from the countries that we computed data from, is that Germany, for single taxpayers, has an income tax rate from 0% (for the first 9,744 euros earned) to 45% (for earning over 274,612 euros). In the case of a flat-taxed country such as Romania, a 10% rate is applied to all incomes, regardless of the amount earned, causing a potential loss of revenues in the state's income.

Moreover, if we look at the data collected for this research and the computation of the findings, we clearly observe that countries that have a progressive tax system collect much more revenues as a share of GDP compared to countries that tax on a flat rate system for income taxes (this includes employment income, trading income, and property income).

In the case of the Human Development Index, an evolution of the indicator was more obvious for the progressive-taxed countries, since 2010. It is worth mentioning that while both the independent indicators of governmental revenues (as a share of GDP) and income tax (share of GDP) were relevant for the regression line of the flat-taxed countries, for the progressive-taxed countries, the second one was not statistically significant.

To conclude, this research may be considered as a tool for the debate in Central and Eastern European countries to finally switch their tax system in line with the developed nations of the European Union. By doing this, the level of inequality can be diminished, and governments can raise more money for their national budget.

The limit of this research lies in the fact that it is difficult to quantify the impact of progressive taxation on Human Development given that, for this paper, we took into consideration only six independent variables. In reality, there are more fiscal factors with potential impact on Human Development, such as taxes on winnings, pollution, wealth etc. Lastly, as a further research objective, we should consider all the components of the governmental revenue, as a share of GDP, and expand the study beyond the EU, to paint a global perspective.

Acknowledgment

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