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CORPORATE INCOME TAX RATES IN THE EU MEMBER STATES: WHY LOWER MEANS BETTER

Andrzej Karpowicz[1]

Abstract

Governments of EU Member States have been reducing statutory corporate income tax rates ("CIT") for several years. What encourages them to take part in tax competition? The article discusses several issues which are in favor of lower CIT rates. They are selected based on their relevance. The study is performed with use of data available from applicable statistical bodies/literature and is based on literature review (especially in cases where required data is not available). It seems that the commonly raised issue of rivalry for capital in the globalizing world economy with highly mobile capital could be only one of a number of reasons for CIT rate depression. Tax competition is fueled by the various sizes of the economies of EU countries as well. The following important rationale may include the aspiration of governments to curb the local shadow economy. There are also some issues of a more theoretical nature that explain decreasing CIT rates. They include: (i) the necessity to accommodate CIT rate levels from the perspective of double taxation of dividends, (ii) the requirement to consider political responsibility of CI or (iii) the need to manage a deadweight loss. As a result of these challenges EU Member States often broaden the legal CIT base to maintain government revenues.

JEL classification: E62, H25
Keywords: Macroeconomic Policy, Fiscal Policy, Tax, Corporate Income Tax

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1 Bialystok University of Technology, Engineering Management Faculty, Financial and Accounting Department; e-mail: a.karpowicz@pb.edu.pl; ORCID: 0000-0003-3229-5272.

Introduction

Over the last decades corporate income tax rates ("CIT") declined (or at least remained at the existing level) in all EU Member States. There is a rising anxiety that tax competition will eventually erode the budget revenues from that tax – especially in small open economies. This has raised concerns of the ability of governments to redistribute income and finance public welfare ((Lee & McKenzie, 1989), (Hicks & Swank, 1992)).

Some see a solution to these developments in CIT harmonization, which should limit the so-called "race to the bottom". Therefore, the European Commission proposes the Common Consolidated Corporate Tax Base for the Member States ("CCCTB"). One of the key arguments of the tax harmonization supporters is the negative influence of tax competition on welfare. Indeed, most of the literature claims that tax competition leads to inefficiently low taxes (Wilson, 1999). Assuming that tax competition means lower CIT revenues, governments have fewer resources to spend on public services. This leads to under-provision of public services and decreases in public welfare. The CCCTB might be a cure to those developments.

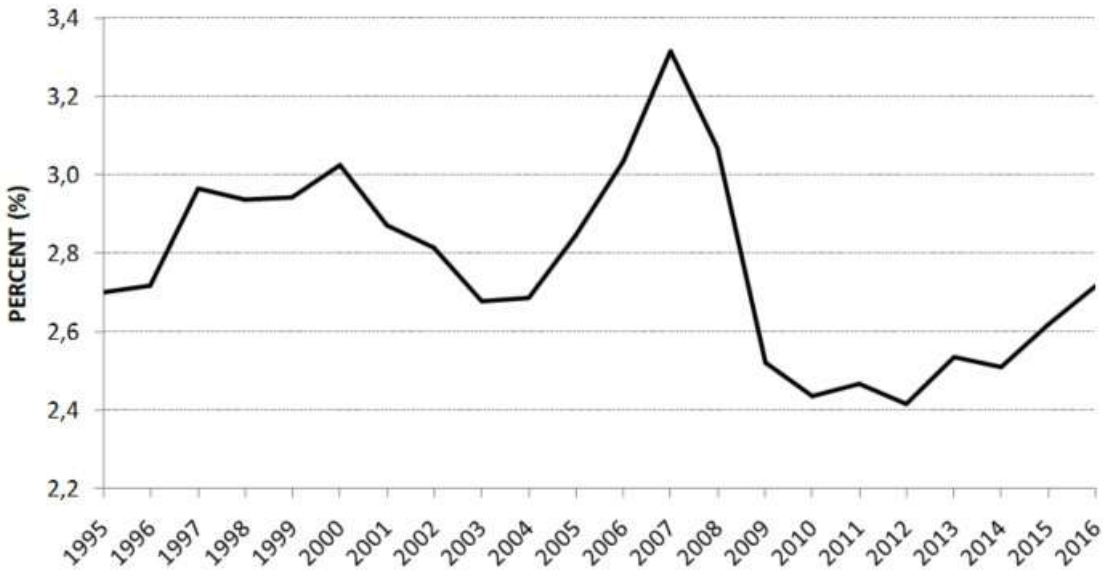
But evidence shows that the budget inflows from CIT remain relatively stable or at least are not strictly decreasing over time. The correlation coefficient for average CIT revenues and top CIT rates in the EU countries is weak and amounts only to 0.37. The reason is that the CIT rate is not the key determinant of budget revenues from that tax.

For example, Karpowicz and Majewska found that corporate income tax revenues depend on GDP growth, globalization of the economy and personal income tax rates whereas the size of the shadow economy proved not to be statistically significant (Karpowicz & Majewska, 2018).

The question arises as to what motivates the governments of EU Member States to decrease the statutory CIT rates. In this article I try to answer that question by discussing several issues in favor of lower CIT rates. The arguments presented here are constructed mainly by application of theory to CIT and by analysis of applicable data for a selected sample of EU countries. For some of the issues examined here it is hard to refer directly to the set of states under review or it is difficult to quantify but I decided to include them to provide comprehensiveness of the study. They may also serve as an outcome for further research. Thus, the key contribution of the paper consists in gathering several arguments in favor of lower CIT rates and their application (to the extent possible) to EU Member States. Such arguments were collected based on scientific and practical experience of the author and supported (where applicable) with appropriate data and calculations and/or references to the literature.

The article is structured as follows. In the first section I present the background of changes of CIT rates in the

Figure 1: Average revenues of EU Members States from CIT (as a percentage of GDP)



Source: Compiled based on Eurostat

EU Member States. In the following step I analyze several issues which seem to encourage EU countries to decrease the CIT rates. Finally, I discuss the results and draw some fiscal policy recommendations.

CIT RATE DEVELOPMENTS IN EU COUNTRIES

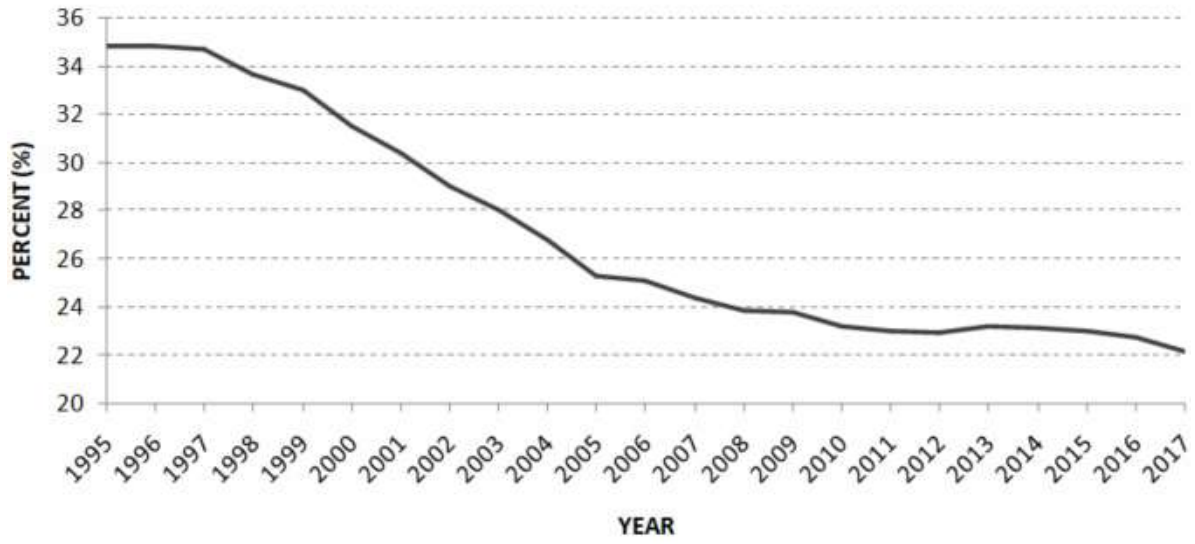
CIT competition mostly originates from rivalry for capital between the USA and Europe. After World War II, the USA was by far the most important global economy and thus it was able to set standards also in the area of taxation. Imposing high statutory CIT rates in the USA did not trigger outflow of capital. Other countries followed the US pattern of high CIT rates, as they were not afraid of outflow of capital because the rates in the USA were not competitive.

The situation has been changing since the mid-1980s. The role of the US economy has started to decrease. The US government responded with lower CIT rates. Consequently, other countries found themselves under pressure to cut the CIT rates to maintain the competitiveness of their own economies. At that time the UK decreased considerably the statutory CIT rates (Devereux, Griffith, & Klemm, 2004). In the early 1990s Scandinavian countries introduced the dual-tax system and reduced the CIT rates in such a way that they were put on a considerably lower level than the personal income tax ("PIT") rates. Eastern European countries after the fall of communism were gaining more attention from investors. These countries were in need of capital. They tried to attract foreign investments inter alia by decreasing CIT rates. The quality of public services offered by those developing states in exchange for the tax collected was poor. The so-called tax competition accelerated and contributed to the further decline in statutory CIT rates in the current EU states ((Devereux, Lockwood, & Redoano, 2008), (Devereux, 2007)).

During the last two decades the process of CIT competition continued. Member States were encouraged to lower the CIT rates, because they perceived them as an important factor which either lures or deters foreign investments. Accession of Central European countries to the EU even encouraged that process. On the eve of EU enlargement in 2004 the CIT rates in the 10 new Member States were on average 10 percentage points lower than in the EU15 at that time. Effective tax rates were estimated to be around half of the EU15 average (Jacobs, Spengel, Finkenzeller, & Roche, 2003). The perspective of shifting capital to newly-joined Member States once more motivated Western Europe to make their CIT systems more attractive to investors.

The figure below presents how far the average top statutory CIT rates of the EU28 Member States has declined over the last 23 years (in several EU states there exist multiple corporate tax rates for other income brackets; for simplicity and clarity I present on the chart only the developments of the top statutory CIT rates).

Figure 2: Average top statutory CIT rates of the EU28 Member States



Source: Compiled based on Taxation Trends in the European Union 2017 (EU, 2017)and Taxation Trends in the European Union 2013 (EU, 2013)

In 1995 the top statutory CIT rates on average were 34.8 percent and were decreasing to 2012 when the level of 22.9 percent was reached. With the second round of economic crisis the tax rates in some countries increased, which could be observed on this figure presenting aggregated data. However, in 2017 the new all-time-low was reached and the average top statutory CIT rates of the EU28 Member States amounted to 22.2 percent. Thus, over the considered period the tax rates decreased by 12.6 percentage point, which means a downturn by over a third.

The scope of changes of the statutory CIT rates differed among the Member States. Current and historic values of top statutory CIT rates could be analyzed based on the table below. It presents the EU Member States in order from the state which cut the top statutory CIT rate the most.

While comparing 2017 to 1995 it strikes us that all Member States decreased their top statutory CIT rates (or at least left the rates unchanged). The range of those reductions varied from 30 percentage points for Bulgaria to no change (but also no increase) for Malta (however, the effective CIT rate in Malta is much lower and with use of special tax refund provisions amounts to 5 percent). Despite these cuts the division between EU Member States is still visible. 12 states with the highest statutory CIT rates are among the EU15 (except for Malta), while the Central European states maintain CIT rates equal to 22 percent or lower.

Reasons for CIT rate depression

In this paper I attempt to give rationale and reasons for the CIT rate depression that could be observed among the Member States. The following sections focus on selected CIT features that support the decrease of statutory CIT rates.

CIT as an element of progressive taxation of individuals

Corporations only pay CIT but do not bear its cost. The capital itself does not bear the cost of the tax. There are only individual, who bear the burden of taxes. Behind any corporation stands eventually an individual. Consequently, CIT is often seen as a tax imposed on shareholders being physical persons. This is because this tax is due on income of a company owned by its equity holders.

However, shareholders who require return on capital invested in a company do not bear only CIT. As a rule, income of companies once distributed to investors is liable to tax due on dividends. Therefore, shareholder income is subject to double taxation - (i) on the level of the company

Table 1: Top statutory CIT rates in the EU Member States in selected years

(in %)	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017	2017 vs. 1995
Bulgaria	40,0	32,5	15,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	10,0	-30,0
Ireland	40,0	24,0	12,5	12,5	12,5	12,5	12,5	12,5	12,5	12,5	12,5	-27,5
Germany	56,8	51,6	38,7	30,2	30,2	30,2	30,2	30,2	30,2	30,2	30,2	-26,6
Italy	52,2	41,3	37,3	31,4	31,4	31,4	31,4	31,4	31,4	31,4	27,8	-24,4
Romania	38,0	25,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	16,0	-22,0
Poland	40,0	30,0	19,0	19,0	19,0	19,0	19,0	19,0	19,0	19,0	19,0	-21,0
Czech	41,0	31,0	26,0	19,0	19,0	19,0	19,0	24,5	23,5	22,0	22,0	-19,0
Slovakia	40,0	29,0	19,0	19,0	19,0	19,0	23,0	22,0	22,0	22,0	21,0	-19,0
UK	33,0	30,0	30,0	28,0	26,0	24,0	23,0	21,0	20,0	20,0	19,0	-14,0
Lithuania	29,0	24,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	-14,0
Luxembourg	40,9	37,5	30,4	28,6	28,8	28,8	29,2	29,2	29,2	29,2	27,1	-13,8
Cyprus	25,0	29,0	10,0	10,0	10,0	10,0	12,5	12,5	12,5	12,5	12,5	-12,5
Greece	40,0	40,0	32,0	24,0	20,0	20,0	26,0	26,0	29,0	29,0	29,0	-11,0
Portugal	39,6	35,2	27,5	29,0	29,0	31,5	31,5	31,5	29,5	29,5	29,5	-10,1
Latvia	25,0	25,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	15,0	-10,0
Netherlands	35,0	35,0	31,5	25,5	25,0	25,0	25,0	25,0	25,0	25,0	25,0	-10,0
Spain	35,0	35,0	35,0	30,0	30,0	30,0	30,0	30,0	28,0	25,0	25,0	-10,0
Austria	34,0	34,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	-9,0
Denmark	34,0	32,0	28,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	25,0	-9,0
Hungary	19,6	19,6	17,5	20,6	20,6	20,6	20,6	20,6	20,6	20,6	10,8	-8,8
Belgium	40,2	40,2	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	34,0	-6,2
Sweden	28,0	28,0	28,0	26,3	26,3	26,3	22,0	22,0	22,0	22,0	22,0	-6,0
Estonia	26,0	26,0	24,0	21,0	21,0	21,0	21,0	21,0	20,0	20,0	20,0	-6,0
Slovenia	25,0	25,0	25,0	20,0	20,0	18,0	17,0	17,0	17,0	17,0	19,0	-6,0
Finland	25,0	29,0	26,0	26,0	26,0	24,5	24,5	20,0	20,0	20,0	20,0	-5,0
France	36,7	37,8	35,0	34,4	34,4	36,1	38,0	38,0	38,0	34,4	34,4	-2,3
Croatia	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	20,0	0,0
Malta	35,0	35,0	35,0	35,0	35,0	35,0	35,0	35,0	35,0	35,0	35,0	0,0
EU-28 average	**34,8**	**31,5**	**25,3**	**23,2**	**23,0**	**22,9**	**23,2**	**23,2**	**23,0**	**22,7**	**22,2**	**-12,6**

Source: Compiled based on Taxation Trends in the European Union 2017 (EU, 2017) and Taxation Trends in the European Union 2013 (EU, 2013)

and (ii) on dividend distribution. The tax theory assumes that such a compounded tax rate should be close to the highest marginal PIT rate applicable for wages.

The rationale for the reasoning presented above is as follows. Shareholders as individuals are believed to be better off and hence potentially subject to top PIT rates if they were to earn a wage subject to progressive PIT rates. For example, 90 percent of the richest families in the USA in 2001 held stock (directly or indirectly) with a median value of USD 248 ths. Concurrently, only 52 percent of the total US population held stock with a median value of USD 34 ths (Aizcorbe, Kennickell, & Moore, 2003). Generally, the fraction of individuals who hold stock rises with the income of these individuals. In this context CIT is regarded also as an element of progressive tax system.

Net income after such a compounded rate may be calculated as follows:

$$(1\text{-}CIT)(1\text{-}PITd)$$

where CIT is the corporate income tax rate and *PITd* is the tax rate imposed on dividends. If instead of dividends the investor derives income from wages, the net income would be:

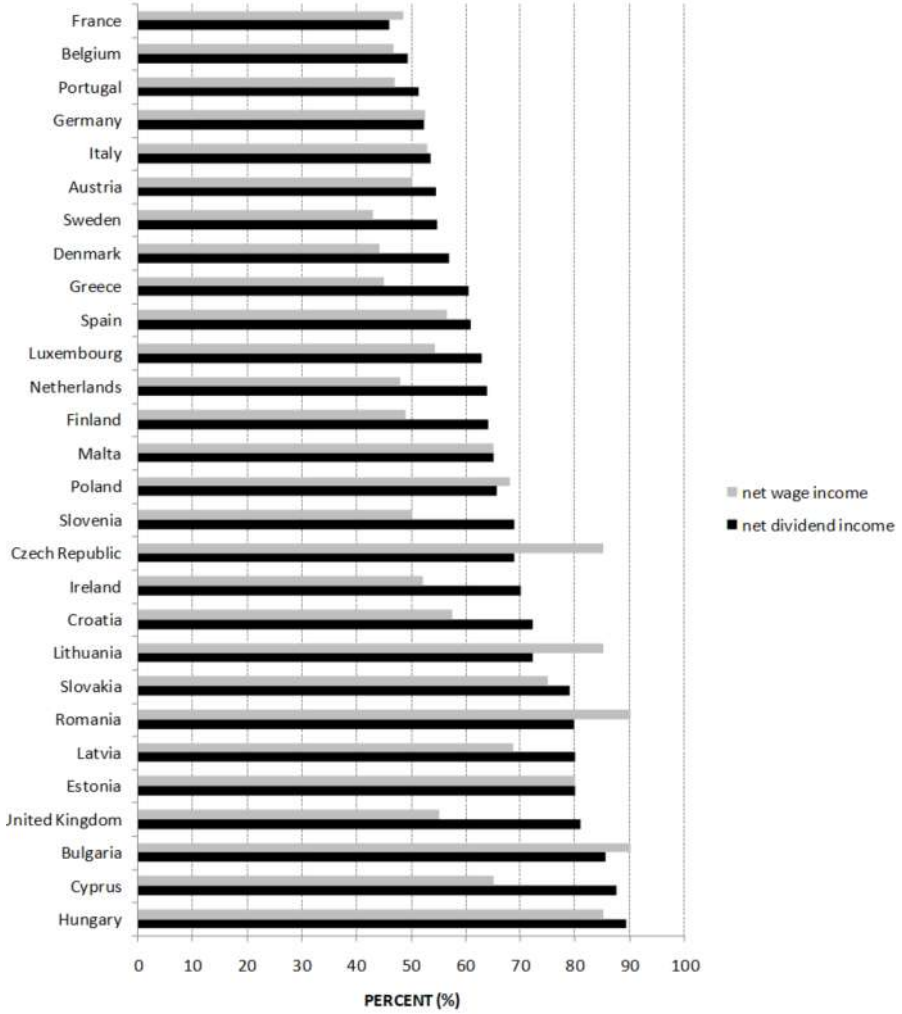
$$(1\text{-}PITp)$$

where *PITp* is the progressive PIT rate. Thus, according to the theory the following equation should be met:

$$(1\text{-}CIT)(1\text{-}PITd)\approx(1\text{-}PITp)$$

For instance, in Poland such a compounded tax rate is 34.4 % (as CIT in Poland is 19% and PIT on dividends is 19%), whereas the top PIT rate applicable for labor is 32%. Therefore, these numbers are close and hence this condition of optimal tax is fulfilled.

Figure 3: Net income earned by individuals (i) from dividends and (ii) from wages; calculations made for EU Member States for 2018



Source: Compiled based on Taxation Trends in the European Union 2018 (EU, 2018)and Withholding Tax Rates 2018 (Deloitte, 2018).

This condition holds also for a number of other Member States. For an overview please refer to the table below, where net income after such a calculated rate of (1-CIT)(1-PITd) is compared with net income after the top PIT rate (1-PITp).

The correlation coefficient of net income computed in such a way is 0.74, which is a relatively high value for empirical data. Therefore, the relatively low CIT rates and their accommodation to PIT rate levels imposed on wages may be appropriate taking into consideration that CIT imposed on income of corporations is usually the first stage of income taxation burden that individuals bear.

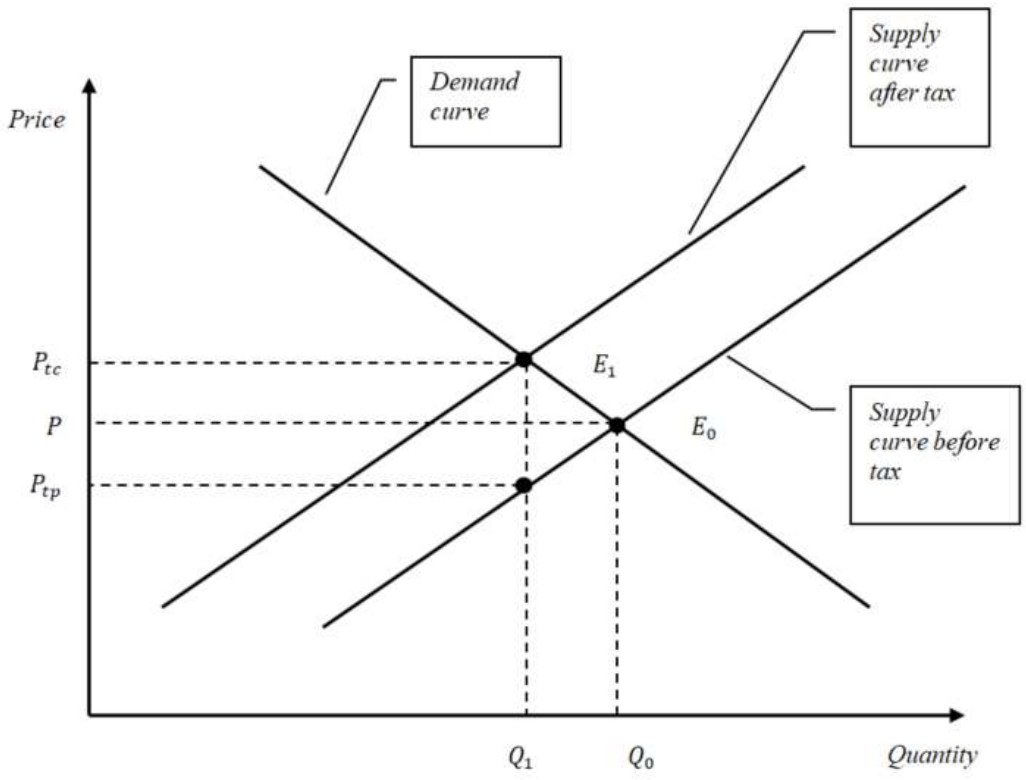
CIT does not meet the political responsibility criterion

According to the theory any taxpayer should be in a position to understand and estimate the tax burden that falls on him. This is required by the so-called principle of political responsibility, which is one of the features of an optimal tax system. CIT does not meet this condition. The reason is explained below.

With respect to CIT, these are obviously corporations, which are the taxpayers. But the actual tax incidence of CIT is completely different. These are almost all categories of taxpayers but the corporations who bear CIT.

In the previous section we agreed that one of the groups affected by CIT cost are shareholders who as a rule are wealthier individuals. According to the model presented by Harberger, CIT is borne not only by the owners of corporate capital but generally by all owners of capital as such (Harberger, 1962). Assuming that investors expect equal after-tax returns on capital and that capital is more heavily taxed under CIT than PIT, capital prefers the non-corporate sector to the corporate sector. This automatically eliminates ventures with low profitability from the corporate sector. The return in the corporate sector and non-corporate sector should be equal. Therefore, the CIT may be borne by the entire capital i.e. not only by corporate investors because CIT affects return in the non-corporate sector. The equalization of returns on capital from corporate and non-corporate capital is possible due to the fact that investors demand a fixed after-tax rate of return. Therefore, the value of corporate assets must drop to the level at which the profitability of the corporate sector would roughly equal that of the

Figure 4: Equilibrium on goods market before and after CIT is imposed



Source: Based on Stiglitz (Stiglitz, 2004)

non-corporate sector. According to the theory envisioned by Tobin and further developed by Hayashi in the interim period the demand for non-corporate capital rises, which is followed by increase in prices of non-corporate assets ((Tobin, 1969), (Hayashi, 1982)). This in turn affects the return on non-corporate capital.

Stiglitz argues that the CIT burden is transferred in fact not only to capital owners but also to workers, consumers and borrowers (Stiglitz, 2004). Workers may experience lower wages, consumers may face more expensive goods and borrowers are exposed to lower after-tax returns. The mechanism is as follows on Figure 4.

If there were no taxes the consumers would buy Q_0 products for price P, which is represented by equilibrium point E_0. After introduction of CIT, the supply curve would move to the left. The shift is a result of marginal production costs increase since investors demand the same return on capital after tax as before the tax was introduced. Consequently, the companies decide to produce less. Although the CIT was formally imposed on the companies, the consumers also bear it. The consumers are now in the E_1 equilibrium point and pay for the goods price P_{tc}, which is higher than previous price P. Companies are not able to shift the total CIT burden onto the consumers. Now the corporations receive higher price for their products P_{tc} but bear the CIT cost of P_{tc}-P_{tp}. That tax concurrently is the revenue gained by the government. It means that effectively companies get the net price P_{tp}, which is lower than the price before CIT introduction P, but higher than the net price the companies would earn, if the total CIT burden fell on them. This mechanism is similar for workers or borrowers.

The fact that it is difficult to tell who bears the CIT is used by politicians. Politicians like to make an impression among unaware voters that these are not the ordinary citizens who bear the CIT but some wealthy companies and their shareholders. Moreover, if a government would decide to abolish the CIT the voters may see such step as give-away to the rich (Slemrod, 2007). Thus, although CIT does not meet the condition of political responsibility, the ambiguity of who bears the cost of that tax paradoxically is one of the reasons supporting the existence of CIT. Summarizing, CIT rate competition may seem justifiable as potentially it leads to less CIT cost in the economy and as a result may limit the influence of tax that is not politically responsible. Regrettably, it is difficult to refer the issue of political responsibility of CIT to the analyzed sample of countries in quantitative terms. I am not aware of any available studies in this respect for the EU that analyze the CIT incidence as well. Thus, this matter might be an area for further research.

High mobility of capital and impact of globalization

Tax competition concerns primarily CIT. This is due to the fact that other taxation objects such as:

a) labor force subject to payroll taxes,
b) goods and services subject to sales or value added tax or,
c) land subject to real estate tax,

are less mobile or not mobile at all and by definition as it is difficult (or even impossible) to report them for taxation in another country. For example, with respect to taxation of the work force the studies show that migrations are primarily income-driven and not tax-driven. Workers migrate in search of better jobs and higher gross wages (often paid in the shadow economy without tax at all) and are only rarely motivated by lower taxation.

Furthermore, PIT is often imposed on smaller firms operating in the form of sole-proprietorships or partnerships. However, companies operating on the international level are usually bigger with more capital shifting possibilities. Thus, mobile capital is connected more with companies rather than partnerships or sole-proprietorships. This suggests that CIT is more affected by the international openness of economies than PIT.

Finally, if capital is mobile, then it needs to exit from investments relatively quickly. Sole-proprietorships are not transferable, whereas sale of partnerships is more burdensome than sale of shares of a company. Thus, mobile capital engages rather in the corporate than non-corporate sector. The objective is higher mobility.

With respect to VAT the main conclusions are as follows. Goods or services can be bought by residents of one country in another other country depending on which state imposes a smaller tax on consumption. The literature shows, however, that such practices decrease rapidly with the distance the consumer would need to move to buy a good taxed with lower VAT.

Finally, as land is immobile by nature, shifts in taxation between countries in this respect are obviously excluded.

The above conclusions are reflected inter alia in

empirical research performed by Winner, who analyzed the influence of capital mobility on the tax burden based on the panel data for 23 OECD countries for the period 1965 – 2000 (Winner, 2005). For the purpose of his model he defined the capital mobility as the absolute difference between domestic savings and investments related to the output $\frac{|S^D - I^D|}{Y}$. He estimated that one percentage point increase in capital mobility means a decrease of CIT burden by 0.18 percentage points (measured according to the concept of average effective tax rates). Concurrently, capital mobility hasa positive impact on the labor tax burden. One percentage point increase in capital mobility transforms into increase of the labor tax burden by 0.07 percentage point or even 0.08 percentage point if the labor tax burden is defined as taxes imposed both on labor and consumption (It is often claimed that workers bear the consumption tax. Hence, Winner adopted also the alternative measure of tax burden on labor as a compounded tax nominally imposed on labor and consumption).

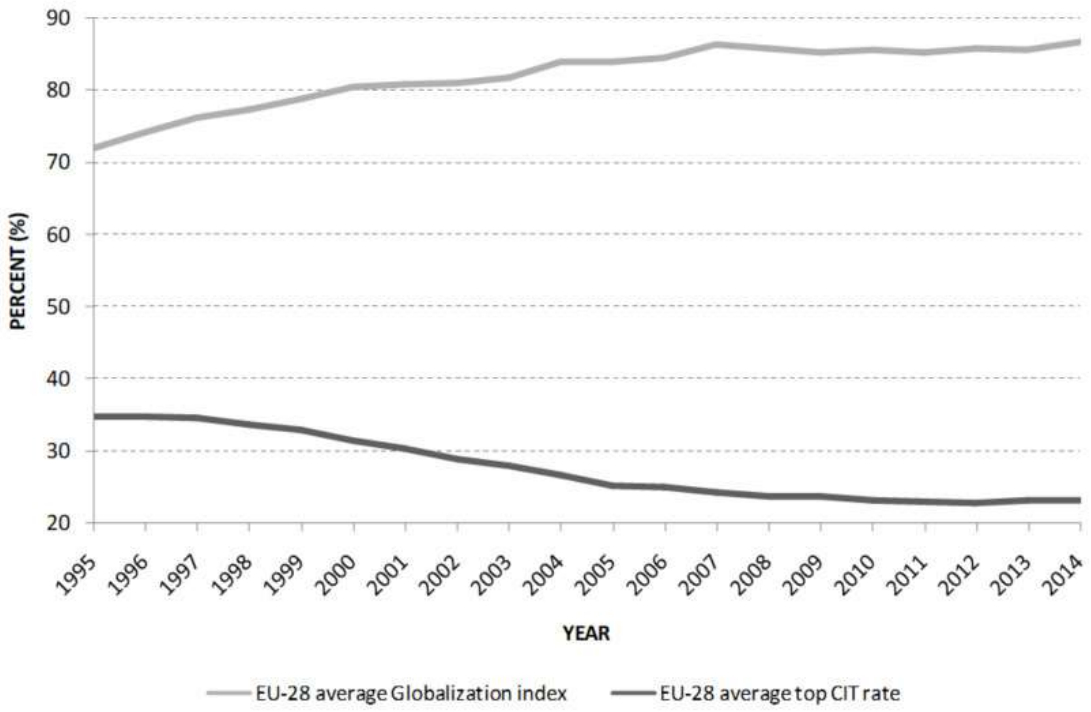
These ideas confirm that it may be more effective for a country from the perspective of raising budget revenues to tax labor or land (as less mobile factors) than capital featuring high mobility.

Mobility of capital is strictly connected with globalization and also puts pressure on low CIT rates. This is due to the fact that taxpayers equipped with more powerful instruments are able more efficiently to avoid taxes. Fear of outflow of mobile capital resulted in the so-called "race to the bottom" hypothesis. Some researchers even questioned the reasons for CIT existence as not efficient enough hand deterring mobile capital ((Gordon, 1992), (Weichenrieder, 2005), (de Mooij, 2005), (Sørensen, 2007)).

Globalization naturally influences mobile factors most. Therefore, CIT which as such is always imposed on mobile factors i.e. capital, is affected more than any other tax. For example, Haufer et al. show that increase in the share of global multinational firms' income in an economy is connected with lower CIT rates (Haufler, Klemm, & Schjelderup, 2009).

To analyze this phenomenon further we compare the decrease of average top statutory CIT rates in the EU Member States with the average globalization index for these groups of countries (the index is calculated and published by ETH Zurich for each country on a yearly

Figure 5: Average top statutory CIT rates of EU28 Member States and average globalization index for EU28 Member States



Source: Compiled based on Taxation Trends in the European Union 2017 (EU, 2017), Taxation Trends in the European Union 2013 (EU, 2013)and Globalization index published by ETH Zurich

basis).

The lower the CIT rates are, the higher the globalization index. The correlation coefficient is -0.96, which means that there is an almost perfect downhill (negative) linear relationship. This is a very robust figure. Such a high correlation coefficient is quite rare for macroeconomic calculations. Taking into consideration the above, it seems that capital mobility connected with globalization exerts pressure on policymakers of particular EU Member States to decrease the CIT rates.

Size of the economy and CIT rate

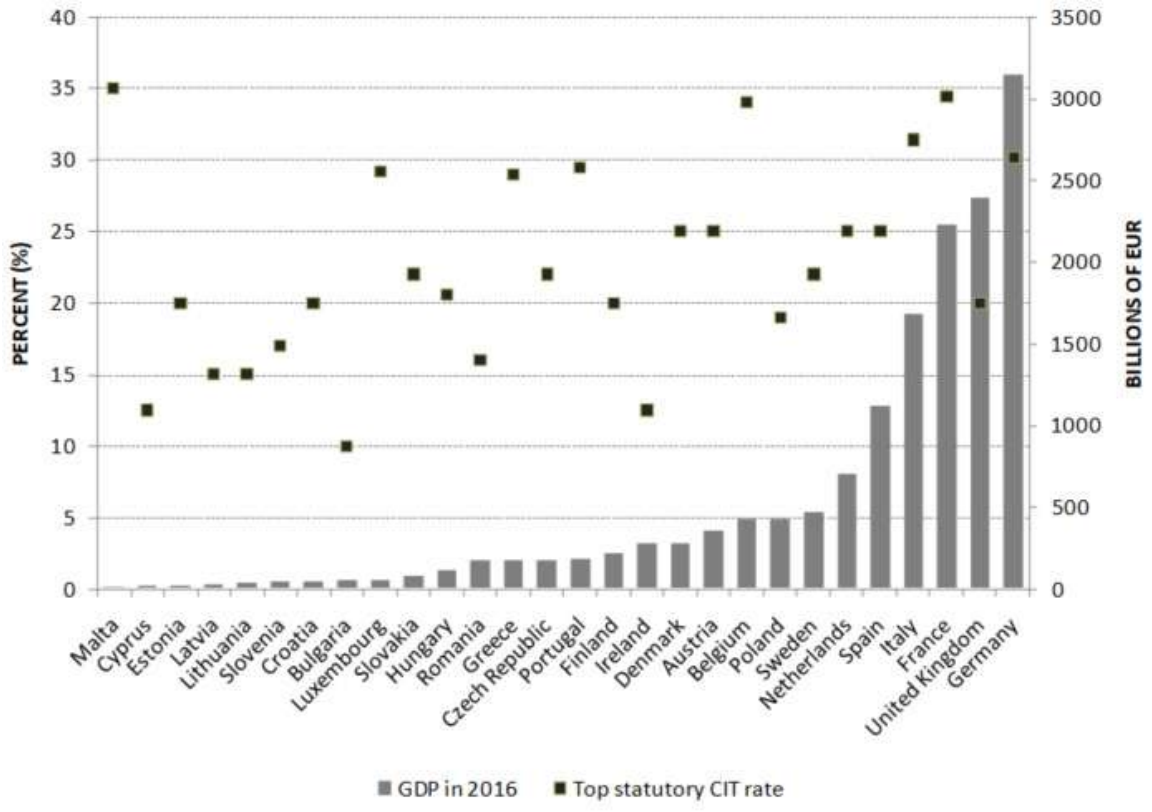
There is pressure on low CIT rates from small economies, which are particularly engaged in tax competition. The EU countries in terms of GDP size are very diverging. Classic economic models claim that assuming perfect capital mobility the optimal CIT rate for a small open economy equals zero ((Diamond & Mirrlees, 1971), (Gordon, 1986), (Zodrow & Mieszkowski, 1986), (Wilson, 1986)). Smaller Member States seem to pursue that aim.

Small economies are particularly exposed to the risk of outflow of capital. Enterprises may easily resign from business operations in one small country leaving its market. Withdrawal from a leading global economy could be unreasonable for an enterprise, even if part of its income would need to be transferred to a local state treasury. Small countries face higher capital supply elasticity than the big countries. The cost of taxing capital at the source increases along with the degree of capital mobility.

Gordon and Varian conclude that bigger countries may have some market power in the world capital market, which supports taxation of capital (Gordon & Varian, 1989). Large jurisdictions are able to "export" part of their tax burden to non-residents in the form of their reduced after-tax returns on capital (Zodrow & Mieszkowski, 1983). Thus, quite an intuitive conclusion would be that small countries could improve national welfare by cutting CIT rates more than the big countries as the response from capital would be higher in the case of small countries.

If two states of different size share the mobile capital tax base, the smaller economy could be interested in fiercer tax rate competition. A small country by cutting the CIT rate may attract a certain share of capital located in the big country, whereas in nominal terms that share

Figure 6: Size of the economy and top statutory CIT rates in 2016



Source: Compiled based on Eurostat

could be considerable. Concurrently, if a big state reduces its statutory CIT rate it will lure a share of capital invested in a small country. However, in proportion to the size of the economy that share may not be significant. Hence, small countries have an advantage in tax competition (Wilson, 1999).

Empirical studies indeed find a linkage between the size of the country and the CIT rates ((Slemrod, 2004), (Weichenrieder, 2005)). Altschuler and Grubert, who analyzed the effective tax rates of foreign subsidiaries of American firms for the period 1992 – 2000 also found that the tax rates fell by the most in the small countries (Altshuler & Grubert, 2004). Bretschger and Hettich focusing on the data for 14 OECD countries for the period 1967 – 1996 estimated that small countries have the lowest CIT rates (Bretschger & Hettich, 2002). Genschel et al., who analyzed EU countries from this perspective for the period 1997 – 2006, arrived at similar conclusions (Genschel, Kemmerling, & Seils, 2011).

This phenomenon holds also for the EU, where smaller states have on average lower CIT rates than the big ones and they reduce the rates faster. Clausing concludes that the tax base in large more closed economies reacts in elastically to tax rate changes in comparison to small open economies (Clausing, 2007). The linkage between the level of CIT rates and size of each EU Member State (measured in terms of total GDP) may be observed based on the below figure.

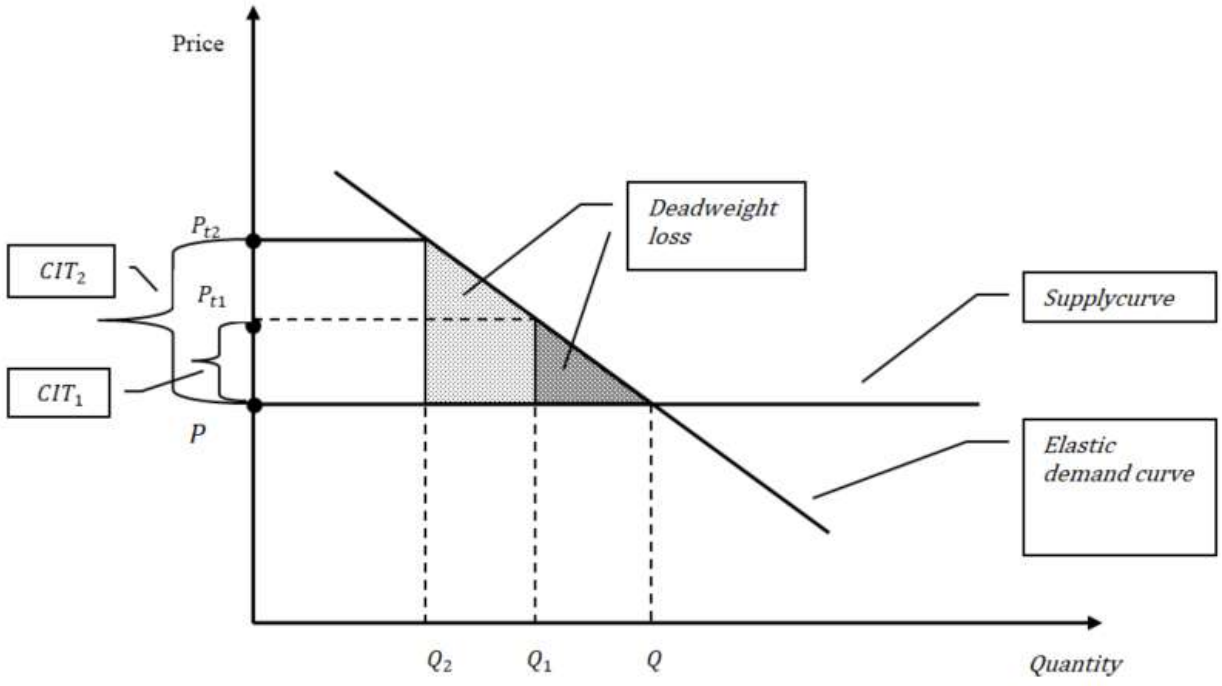
From the graph it strikes us that the linkage between top statutory CIT rates and the size of the economy exists. One very outstanding country from this trend is Malta, where despite the tiniest economy in the EU, the statutory CIT rate is 35 percent. However, the effective CIT rate in Malta is much lower and amounts to 5 percent as a result of special tax refund provisions, which means that in practice the issue of Malta is exceptional. The correlation coefficient between total GDP and level of top statutory CIT rates for the EU countries in 2016 is 0.4 including Malta and 0.48 without Malta. Although such a value remains average it confirms to some extent our reasoning.

Lower CIT rate means lower deadweight loss

Deadweight loss rises exponentially with the increase of the tax rate. This can be well observed on the below figure.

Low CIT_1 rate results in a deadweight loss equal to the dark grey triangle. Two times higher CIT_2 rate produces a deadweight loss equal to the whole triangle, which seems four times bigger. Finally, if the tax would be raised even higher above CIT_2 not only the deadweight

Figure 7: Size of the deadweight loss depending on the tax rate level



Source: Based on Stiglitz (Stiglitz, 2004)

loss would rise but the government tax revenues would start to decline. Therefore, an assumption that high tax rates are particularly distortive is fair.

To estimate the deadweight loss it is enough to calculate the integral. The vertical edge of the triangle presented above is the amount of CIT, which we will denote as *t*. The horizontal edge is equal to the change in quantity of acquired goods. That change depends on the demand elasticity for a good. Elasticity is calculated as increase in quantity divided by increase in price.

$$\mathrm{n} = \frac{\Delta \mathrm{q}/\mathrm{q}}{\Delta \mathrm{p}/\mathrm{p}}$$

Transforming the above equation we get:

$$\Delta \mathrm{q} = \frac{\Delta p}{\mathrm{p}} qn$$

This equation shows that the change in quantity is higher (i) the bigger the change in price is and (ii) the more elastic the demand curve is. As in our model the change in price is equal to tax *t* we get:

$$\Delta \mathrm{q} = \frac{\mathrm{t}}{\mathrm{p}} qn$$

Thus, the triangle field is equal to:

$$\frac{1}{2}\Delta qt = \frac{1}{2}\frac{t}{p}qnt = \frac{1}{2}\frac{t^2}{p}qn = \frac{1}{2}(\frac{t}{p})^2 pqn$$

However, $\frac{t}{p}$ is the change of the relation of tax to the price, which is actually the tax rate *T*. Hence, we get the following equation:

$$\frac{1}{2}(\frac{t}{p})^2 pqn = \frac{1}{2}T^2 pqn$$

Based on the above we see that the deadweight loss rises (i) to the squared tax rate (as presented on the below figure) and (ii) substitution effect, which depends on the elasticity of demand.

Ballard et al. found that for CIT per dollar of revenue raised there is a deadweight loss of 46 cent, whereas for PIT it is only 23 cent (Ballard, Shoven, & Whalley, 1985). Fullerton and Kodrzycki Henderson obtained estimates of 33 cent and 26 cent, for CIT and PIT respectively(Fullerton & Kodrzycki Henderson, 1989). Judd, who used a dynamic perfect foresight model, arrived at a deadweight loss of 25 cent for CIT and 15 cent for PIT (Judd, 1987). Thus, the deadweight loss on CIT is estimated to be higher in comparison to other taxes. Huizinga and Laeven estimated elasticity of the corporate tax base to the rate for European countries at the level of 0.45 (Huizinga & Laeven, 2008). Therefore, knowing that the average corporate tax rate in the EU in 2017was 22.2 percent, the deadweight loss as a percentage of tax collected would be 5 percent.

Obviously, a lower CIT rate transforms into lower deadweight loss. This holds for any world economy as we have here a universal mathematical calculation. In particular, there should be no specific issues in this respect applicable to the EU. This finding is confirmed also in empirical studies quoted in the paragraph above and the calculation I made for Member States (as presented in the previous paragraph). Thus, this is another rationale for CIT rate decreases.

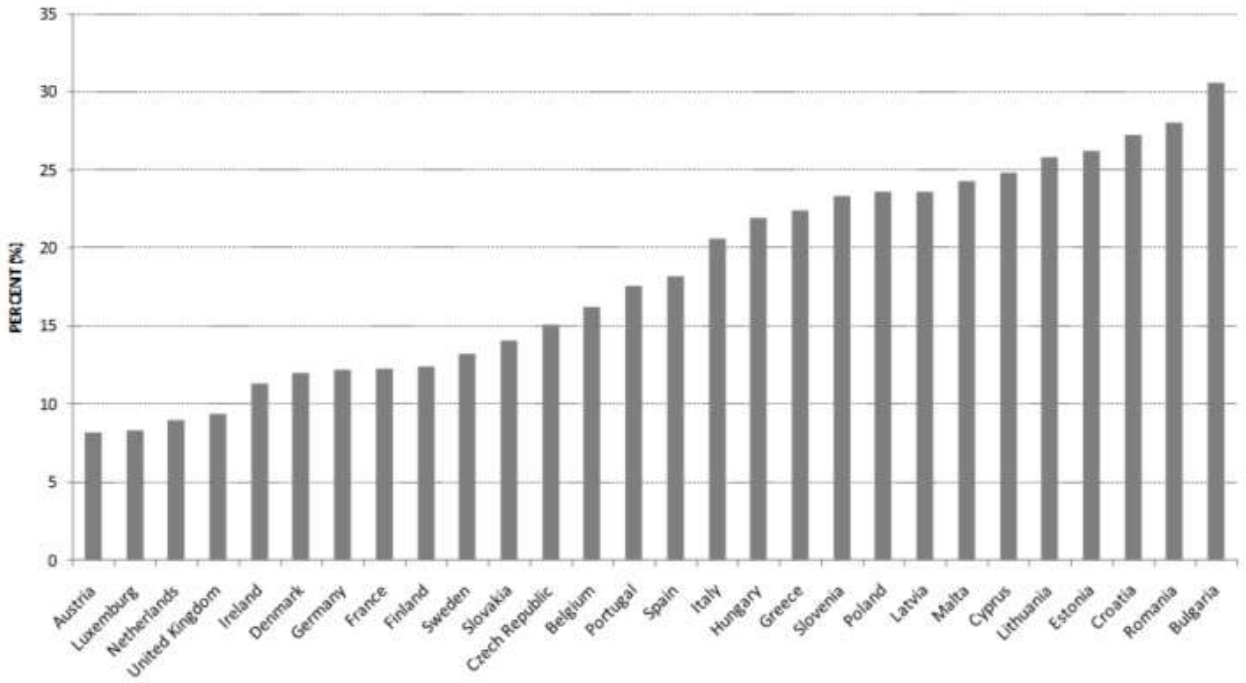
Stifling the shadow economy

Tax cost is probably the most important determinant of the shadow economy. Feld and Schneider estimated based on 12 or 22 empirical studies that increase in tax and social security contribution burdens is responsible for 35-38 percent or 45-52 percent of the size of the shadow economy, respectively (Feld & Schneider, 2010).

Schneider estimates that in 2003 in EU countries the size of the shadow economy generated on average 22.3 percent of GDP but systematically dropped over time. In 2012 it arrived at 18.4 percent (Schneider, 2013). However, the EU is not homogenous in this respect. Below is presented the size estimated by Schneider of the shadow economies in EU countries in 2015 (Schneider, 2015).

When comparing the above figure with Table 1 (Top statutory CIT rates in the EU Member States in selected years) one may suspect that there is not necessarily a linkage between the shadow economy and CIT rates. The CIT rates in Austria, Luxembourg, or the Netherlands are relatively high although these countries have the smallest shadow economies. In Bulgaria or Romania, the tax rates are low, but the shadow economy is high. Friedman et al. conclude that only good governments can sustain high tax rates (Friedman, Johnson, Kaufamm, & Zoido-Lobaton, 2000). This means that in practice welfare states with developed economies have the tools and power to impose higher taxes and concurrently to control the shadow economy. We may expect that indeed there is a correlation between the CIT rates and size of the shadow economy but in order to calculate that a time series data is required on the size of the shadow economy in particular Member States. For such an overview please refer to the

Figure 8: Size of the shadow economy in Member States in 2015 (percentage of GDP)

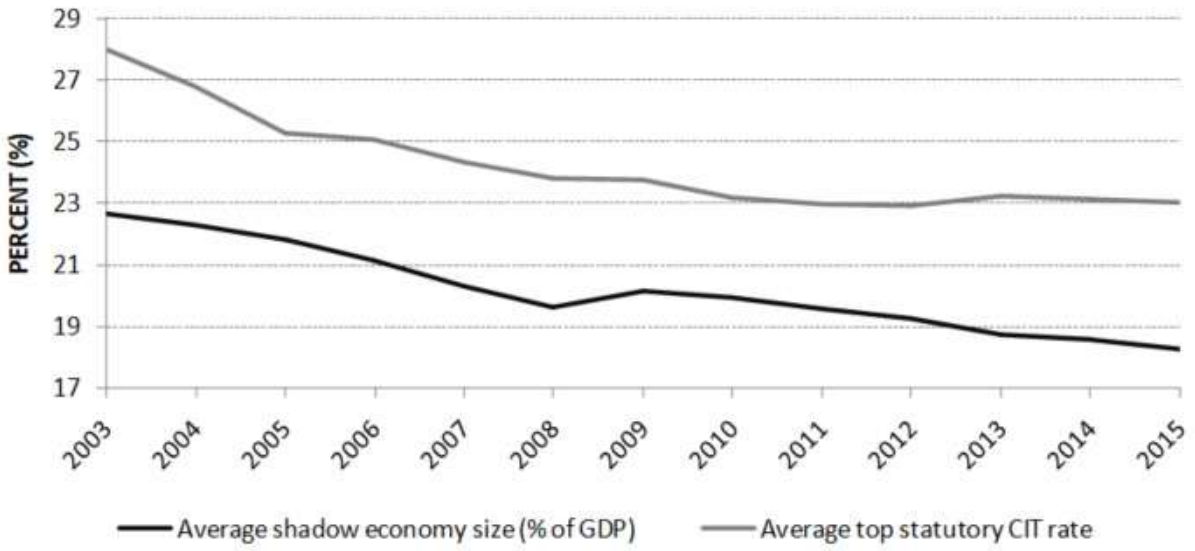


Source: Compiled based on Schneider (Schneider, 2015)

below figure.

Taking into consideration the above we may assume that indeed the size of the shadow economy follows the level of the CIT rate. The correlation coefficient is 0.92, which means that there is almost a perfect positive linear relationship. Due to its nature the correlation of course does not provide a casual link. Panel data regression may be more applicable, but such additional calculations will not be made in this short article.

Figure 9: Average top statutory CIT rates of EU28 Member States and average size of the shadow economy in EU28 Member States



Source: Compiled based on Taxation Trends in the European Union 2017 (EU, 2017)and Schneider (Schneider, 2013) and (Schneider, 2015)

CIT base broadening

There are spreading ideas claiming that broader legal CIT bases and low statutory CIT rates are in general superior in economic policy terms to narrow CIT bases and high CIT rates. EU Member States seem to make use of that knowledge. Analysis of the below figure may suggest that.

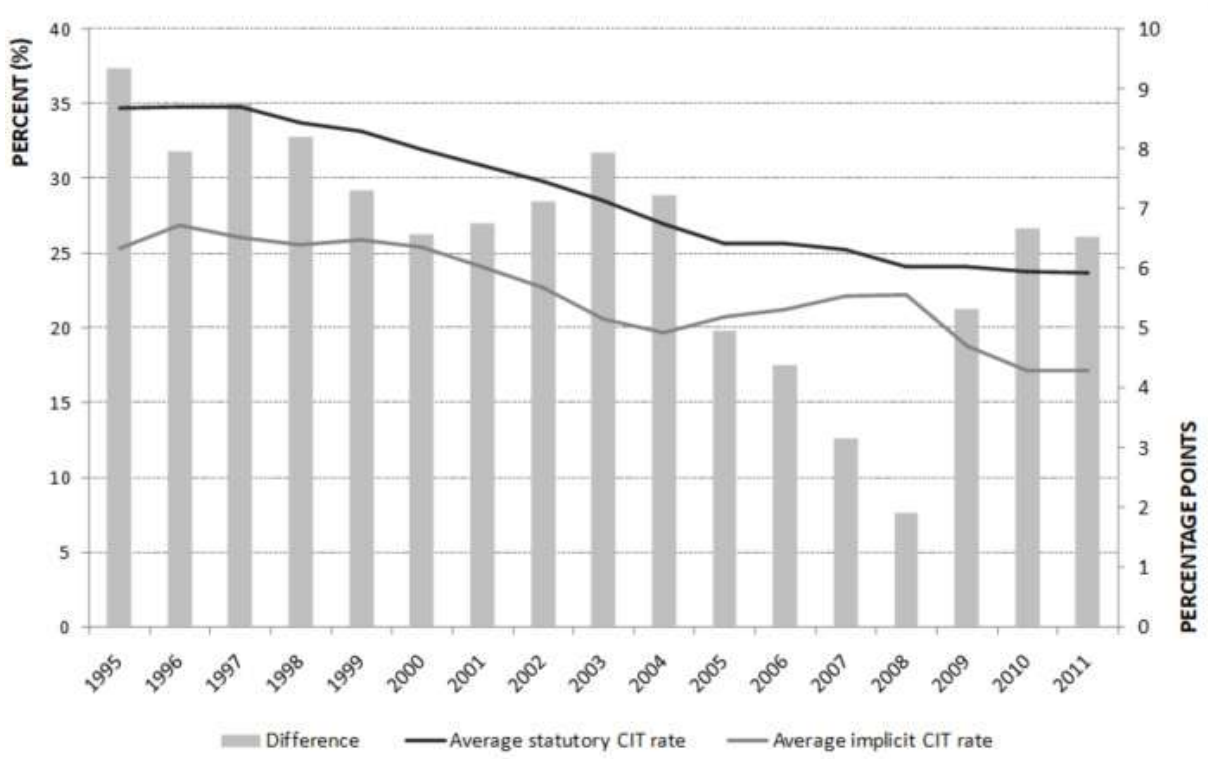
Whereas statutory CIT rates have been declining almost year on year and among EU countries fell in the period 1995 - 2011 on average by over 11 percentage points, the effective CIT rates have decreased by some 8 percentage points. Thus, the pace of the decline was significantly lower in comparison to the statutory CIT rates.

The more moderate decline of effective CIT rates can be explained inter alia by the broadening of tax bases in particular Member States, which compensated the sharp fall of statutory CIT rates. However, as we see on the above graph the tax base broadening practices have not fully neutralized the decline of statutory CIT rates. In other words, the effective CIT rates were generally falling. Moreover, the breadth of the tax bases differs significantly. Schratzenstaller claims that in general the legal tax bases in EU15 countries are considerably narrower than among the Member States that joined the EU in 2004 (Schratzenstaller, 2007).

The key argument for reducing CIT rate is that the level of the tax rate is easily observable by the investors and more understandable to them. The scope of the legal tax base is much more burdensome to define and hence investors have difficulties in observing the differences in this respect between the states. A tax rate reduction sends a much stronger competitive signal to investors than the tax base narrowing (Ganghof, 1999).

According to empirical studies the statutory tax rate is the most important determinant of the effective tax burden of corporations (EC, 2001) and high income individuals (PricewaterhouseCoopers & ZEW, 2005). This argument holds also for CIT purposes, since as discussed earlier CIT is born in fact not by companies but by individuals including shareholders. Hence, individual

Figure 10: Average statutory and implicit CIT rates in the EU



Source: Based on Eurostat; due to limited number of data for implicit CIT rates the graph was made for 19 EU countries i.e. Belgium, Czech Republic, Denmark, Germany, France, Italy, Cyprus, Latvia, Lithuania, Hungary, Netherlands, Austria, Poland, Portugal, Slovenia, Slovakia, Finland, Sweden and UK; Eurostat does not update data on implicit tax rates any more, therefore the above figure does not contain information for most recent years

investors are interested in the level of CIT rates.

A broad tax base usually reduces the tax compliance and administration costs. This is based on the assumption that a broad legal tax base in opposition to a narrow tax base provides for fewer exemptions or allowances. Devereux et al., who analyzed the CIT developments in the OECD countries showed that the legal tax base broadening processes have been carried out by reduction of accelerated depreciation schemes, limitation of loss offset abilities, restrictions on interest deductibility or refusal to treat certain expenses as tax deductible, etc. (Devereux, Griffith, & Klemm, 2002). Fewer modifications of accounting income make the taxable income easier to calculate for the firm and to pay the tax in the appropriate amount. Concurrently, simple CIT rules are also advantageous for tax authorities which perform tax audits. Administrative simplicity (which is one of the features of an optimal tax) is easier to reach with a broader legal tax base and low CIT rate than the other way round.

Finally, a narrow tax base - unlike a low statutory CIT rate - does not offer protection from profit shifting or outflow of capital ((Zodrow, 2006), (Genschel & Schwarz, 2011)). Consequently, governments broadened tax bases while reducing the CIT rates as this should limit tax avoidance.

Discussion of the results and conclusions

CIT rates were decreased several times over the last years by almost all EU Member States. Such an approach by politicians is understandable. There are several arguments supporting the developments in this respect which were analyzed in this article. However, they play different roles in shaping fiscal policy with respect to CIT and their importance varies.

CIT is an element of the progressive taxation of individuals. Eventually the shareholder of each company is an individual, who bears not only PIT but also CIT. Therefore, the compounded CIT rate and PIT rate applicable to dividends should align with the top PIT rate applicable on wage income of individuals. To meet this condition the CIT should be on a relatively low level. Consequently, from this perspective a CIT rate level more nationally oriented as a reference to the local PIT rate on wages is crucial.

CIT incidence is not easily observable. Various economic agents are not in a position to say to what extent they bear CIT. Therefore, CIT does not meet the criterion of political responsibility being a feature of any optimal tax. Consequently, lesser CIT cost means less tax that is not optimal. Nevertheless, CIT is a part of fiscal policy and an important source of fiscal revenues. CIT acts also as a PIT backstop by curbing erosion of budget revenues from that tax. Slemrod found in his cross-country analysis a strong association between the top statutory CIT rate and the top statutory PIT rate (Slemrod, 2004). Therefore, the importance of CIT is greater than is suggested solely by the CIT revenues, because it serves as a backstop to PIT (i.e. in the absence of CIT, the PIT revenues would be descending e.g. due to firms that would prefer to incorporate to pay no tax rather than to run the business in the form of partnerships).

Capital which is subject to CIT could be shifted among jurisdictions. As this mobile factor is difficult to tax, it might be more reasonable to resign from elevated statutory rates for the benefit of a larger tax base. Globalization puts additional pressure on capital mobility. Therefore, the higher degree of globalization the more governments of EU Member States are afraid of tax base erosion and are eager to reduce the statutory CIT rates. This factor seems to be taken into consideration primarily by smaller EU countries. The smaller the economy the more it is inclined to keep the CIT rates low in the view of attracting a higher share of capital. That capital may not be significant in percentage terms of total world assets but still in nominal terms might enlarge the tax base of a small state to a satisfactory extent. According to the theory the CIT rates in small economies should be lower than in the large economies as the governments in small countries do not have enough power to tax mobile capital. At the same time, once smaller EU economies set CIT rates on a lower level, they become some reference point for the other countries. Consequently, bigger EU Member States are more inclined to reduce CIT rates as well in rivalry for mobile capital.

CIT produces a deadweight loss that rises with the increase of the tax rate. To manage that undesirable state, a moderate rather than a high level of CIT rate could be a solution. Assuming that elasticity of demand (which is one of the two factors that impact size of deadweight loss) is comparable among countries of the world, then such deadweight loss should be lower for EU Member States than for world economies. The reason is that on average

the CIT rate in EU amounts to 21.3 percent in comparison to 24 percent for the world in total (data for 2018; according to calculations of KPMG). Therefore, probably the pressure for further decrease of the CIT rates in the EU is relatively smaller from that perspective.

The shadow economy depends inter alia on the cost of tax. Lower tax cost transforms into a larger tax base as taxpayers move into the official economy. Based on Schneider estimations of the shadow economy for the EU is on average 18.3 percent. This is far lower than the mean for the world of 32.3 percent (Schneider & Medina, 2017). Therefore, it seems that the shadow economy also plays a less important role in shaping revenues from CIT in the EU than elsewhere. However, that impact should still not be negligible.

Revenues collected by governments depend both on the statutory tax rate and tax base. Tax base includes (i) the tax base given by law and (ii) the total income of taxpayers subject to tax. To accommodate for reduction of the statutory CIT rates, legal tax bases are broadened. This is done primarily by extension of different categories of incomes subject to tax or by elimination of tax incentives. That approach has several advantages that include decline in tax avoidance, lesser discouragement of capital for a particular jurisdiction or reduction of tax compliance cost.

Summarizing, there are a number of reasons for lowering CIT rates. However, some of them are more theoretical in nature and it might be doubtful if they are thoroughly considered by governments when setting the tax rates. To this group I would allocate the matter of (i) dividend vs. wage taxation, (ii) political responsibility or (iii) size of deadweight loss. In practice governments are more likely to decrease the CIT rates due to (i) high mobility of capital and globalization of economies and (ii) size of local shadow economies. At the same time the legal breadth of the tax base is rather a tool for maintaining budget revenues from that tax on a satisfactory level than a cause for CIT depression.

Taking into consideration the above, the downward trend of CIT rates might seem inevitable. Assuming that EU states want to maintain total tax revenues on the current level, there are three practical solutions. Countries may attempt to (i) fight the shadow economy, (ii) dampen mobility of capital or (iii) seek to increase other taxes or impose taxes on new objects. The answer to the first idea is complex and not the aim of this article. The second solution might include consolidation of taxes among states - e.g. through adoption of CCCTB and further development of the model of common EU corporate taxation. The third scheme might assume elevating taxes on objects that are less elastic and hence might not easily escape from taxation in a certain country. Alternatively, new sources of revenues might be taxed – for example the not yet fully exploited environmental taxes on property. Any solution has however disadvantages, whose precise identification is not the aim of this article.

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