

Tax Structure Changes in the European Union

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The European Union does not have a comprehensive common tax policy and substantial changes in this specialized area of policy in the foreseeable future aren't likely either. Albeit common rules, requirements, minimum rates for certain tax types were implemented in the last few decades, they barely limit the member states in using their tax policies as one of the worthiest elements of their arsenal in increasing competitiveness or quite the contrary, to undermine their own international competitiveness inadvertently through a misguided tax policy. In this article, we put the tax policies of the Visegrad Group and the Eurozone core countries (Germany, Austria, Netherlands) and their changes under the magnifying glass, in terms of the impact of tax structure changes on economic growth and employment in the last decade.

1. Introduction

In lack of a common tax policy in the European Union, member states are given relatively free rein in shaping their own tax policies, albeit the fiscal regulations related to European integration pose external limits to developing the budget policy and thereby to the appropriate tax policy. Albeit common rules, requirements, minimum rates for certain tax types were implemented in the last few decades, they barely limit the member states in using their tax policies as one of the worthiest elements of their arsenal in increasing competitiveness or quite the contrary, to undermine their own international competitiveness inadvertently through a misguided tax policy. The study puts the tax policies of the Visegrad Group and the Eurozone core countries (Germany, Austria, Netherlands) and their changes under the magnifying glass.¹ While doing so, our main focus is to analyze to what extent the tax structure changes and shifts are in line with the growth-friendly tax structure recommendations of the European Commission.

First we examine the possible correlations between the five large tax categories (labor-income taxes, capital income taxes, consumption taxes, property taxes and environmental taxes) and growth and employment, based on theoretical and empirical studies. There are no

¹ Hungary is given a special role in the study, albeit not all the tax reforms of the period examined are presented descriptively. For changes since 2010, see the article authored by Baksai–Csomós–Kiss in 2014.

clear conclusions as to what impact the changes to the ratio of certain tax types within government revenue can have on growth and employment in a certain country. Indeed, the effects depend on many country-specific factors, such as the elasticity of the labor market supply in the case of labor-income taxes. Nevertheless, following the recommendations of the Commission, we are going to outline the scope of tax types which exert the least distorting effect on economic growth and employment.

Then we analyze the individual tax types in detail to determine what tax structure changes are characteristic in the EU states. In addition to outlining the general trends in the EU, our analysis will also touch upon how the shifts in emphasis in the tax policy of the Hungarian budget differ from the trends in the competing states in the region (Czech Republic, Slovakia and Poland) and the core countries of the Eurozone (Germany, Austria, Netherlands). Data published on the Eurostat website² and tax publications of the European Commission and of the Eurostat served as data sources.

Nevertheless, we must point out that any examination of the GDP-proportional size of revenue from certain tax types within the various tax categories may be quite distorting. This is relevant especially for the crisis, where economic shrinkage, decline of production, demand and employment and thereby of revenue from tax types on these activities, to a degree which surpasses even the pace of GDP change, obscures the shifts in proportions within revenue triggered by any tax base or tax rate changes. For this very reason, the major tax reforms have also been presented where necessary.

2. Impact of taxes on economic growth and employment

The duties of a tax system are (i) to secure the funds for the budget, (ii) to supply the income redistribution function, (iii) to act as a stabilizer during the cyclical fluctuations of economy, (iv) to enable the internalization of externalities, that is the costs of outside negative impacts (e.g. in the case of taxes on environmentally polluting operations), (v) and at the same time, to influence the allocation of resources on the level of national economy. However, taxation can have a significantly distorting effect on economic growth both in the short term and in the long term. The theoretical chapter examines the potential distorting effect of taxes which is exerted through influence on the conduct and decisions of economic players.

² Eurostat database http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database (between 15-30.06.2014)

The main purpose of the *optimal taxation theory* is to answer the question of how it is possible to create a tax system which ensures attainment of the economic policy objectives set, and at the same time least distorts decisions of economic players and involves the lowest possible administrative costs, minimizing the negative impact of taxation on economic growth (European Commission (2011b)). Some optimal taxation theories also add the justice criteria to these two conditions. In this study, we shall not enter into much detail about the administrative cost³ and fairness criteria related to the tax system⁴ (albeit the importance of efficient administration will be emphasized when we analyze the consumption taxes). Our study focuses on the impact of certain taxes grouped by economic function (labor-income taxes, capital income taxes, consumption taxes, property taxes, environmental taxes) on *economic growth and employment*. First, we examine the theoretical impact of certain tax categories, then we present the empirical results and conclusions from the model calculations, and outline the direction of tax structure changes considered desirable by the European Union for economic growth.

Labor-income taxes (personal income tax, employer's contributions and employees' contribution) exert an impact on decisions of economic players through three channels. Thereby they affect the demand and supply sides of the labor market, as well as the investment and accumulation decisions: they influence the employee's preferences and decisions related to leisure and division of labor, and they also impact investment decisions of economic players, as well as the accumulation of human capital (Meghir – Phillips 2010; Bocconi 2011). Examining *the changes of labor supply triggered by taxation* requires a complex impact analysis. An individual may decide to deem leisure or work more useful in a given situation. Tax reduces their net income, which means they can afford less leisure time, while the wage income which should be used for more leisure would be reduced. The first effect is called the income effect, while the second is the substitution effect. So the elasticity of labor supply (i.e. how an employee changes his or her labor supply as a result of a change

³In terms of administrative levies, both the national and international experts are in relative agreement in that the simpler and more transparent a tax system, the less it is characterized by tax avoidance (European Commission 2011b). It can also be established that tax avoidance is more difficult and administration cheaper in the case of indirect consumption taxes than in the case of investment-related and labor-income taxes, which are direct taxes (Elek – Scharle 2008).

⁴ Examination of justice depends on the justice concept itself, too. The different methods used for establishing and measuring social welfare reflect the possible differences in how justice is seen. The two extremes are the utilitarian solution where social welfare is the sum of the individuals' well-being, and the Rawlsian maximin rule where the social welfare function is defined as the well-being of the poorest of society and we strive to maximize it. (Bakos et al. 2008).

in the average or marginal rate⁵) is measured as the product of the vector of two contrary effects (Scharle et al. 2010). The labor supply of individuals can be influenced by income tax rates through two channels. First it affects the individual's presence on the labor market i.e. whether they work or not (extensive margin), but it can also impact the number of hours worked (intensive margin). Average tax rate exerts its impact through the first channel, while marginal tax rate through the latter one. Labor taxes also touch the *demand side of labor*; indeed, any raise in them will make the given production factor more expensive, too. So tax raises will exert an impact depending on the elasticity of labor demand (how the production factor becoming more expensive will influence demand). We should also mention the distorting effect of labor-income taxes on *human capital accumulation* i.e. how labor-income taxes influence the individual's decision related to qualification trainings and studies. This is determined basically by the progressivity of income tax. The higher the tax burden on people who earn more, the less it is worth accumulating human capital (Meghir – Phillips 2010).

Capital income taxes (including taxes on profit from business, on returns of private individuals' savings, such as capital income, dividend and interest taxes) play a role in economic growth and productivity through the individuals' savings and investment decisions. As these effects generally apply in the long run, too, they are associated with a significant downward effect on economic growth. For this reason, most theoreticians see zero capital income tax as desirable in the long term (Samuelson 1954; Judd 1985; Jones et al. 1997). Nevertheless, theoretical discourses give more room to the conclusion that it is not zero income tax which is desirable (Sørensen 2007).

Consumption taxes (mostly including value-added tax⁶ and excise duty) are looked at favorably both in domestic and international literature, in terms of their impact on economic growth. At the same time, any definition of the basis and rate of consumption taxes should bear in mind that there are low and high price elasticity products. In the case of low price elasticity products, any tax on them will not have a significant influence on demand for those products, which means the consumption tax will have a low distorting effect and low adverse impact on economic growth.⁷ In the case of certain excise duties (such as those on tobacco

⁵ Average rate shows what portion of an employee's gross income is paid as taxes, while marginal tax rate expresses how much tax would have to be paid by an individual in case of earning one unit more. Average tax rate can show the income effect, while marginal rate demonstrates the substitution effect (Scharle et al. 2010).

⁶ Hereafter in the study we use the term "sales tax" and "value-added tax" interchangeably. The latter term is used in Hungary.

⁷ This approach actually draws attention to the practical application of the Ramsey rule: consumption tax is optimal in the case of households with similar consumption habits if its rate is inversely proportional to the price elasticity of the product (Ramsey 1927).

and alcohol), the distorting effect on consumption is often desirable, as the goal is to influence demand for these products.

However, some theoretical concepts suggest that a uniform consumption tax has the same impact as a uniform wage tax, in terms of the budget limits of individuals (Atkinson – Stiglitz 1980). Nevertheless, we should remember that income taxes and consumption taxes differ in terms of efficiency. If the weight of consumption taxes in the total tax burden increases against income tax, it is likely that the aforementioned decrease of the distorting effect and increased efficiency (both in terms of administrative costs and payments) will have a positive influence on the labor market and economy as a whole. There is no widely accepted model of the optimal ratio of the two tax types, albeit the literature on the effects of taxation attaches an increasing importance to this matter (Crawford et al. 2008).

As for *property taxes*, we can state that they can impact economic growth in many ways depending on the various tax types (European Commission 2011b). This group includes real estate taxes, net welfare taxes, donation and estate taxes, taxes on financial and capital transactions.⁸ Of the tax types listed, real estate taxes have the least distorting effect on growth, as they do not influence labor and investment decisions. As opposed to this, estate and donation taxes may hinder capital accumulation, while welfare taxes are similar to capital taxes and capital income taxes, insofar as they can distort savings decisions and thereby investment decisions, which has an essential impact on the improvement of productivity and hence on economic growth. Taxes on financial transactions and capital transfers can have a negative effect on investment decisions, as they increase the cost of capital. This means that of property taxes, real estate tax has the least distorting effect on economic growth.

Environmental taxes, known also as corrective or green tax in national and international literature, gain more and more weight in European discourses on the desirable tax structure reforms since the global economic crisis. They include energy taxes, transport taxes, pollution taxes and taxes on natural assets. This tax type largely facilitates the internalization of the costs associated with the negative impacts of environmentally harmful activities and also acts as an incentive in the development of environmentally friendly technologies (Prammer 2011). Additionally, as it transpires from the model-based study of the European Commission, increasing the proportion of energy taxes within national tax systems (assuming that the excess revenue from energy taxes is paired with a similar decrease in social security contributions imposed on labor) has a positive impact on employment and gross

⁸ We should note that in Hungary, financial transaction duty is classified as a sales tax.

domestic product. The higher the rate of increase of public revenue from energy taxes to the detriment of social security contributions, the stronger the positive impact (European Commission 2011a).

The prevailing conclusion from analyzing the impact of the tax categories listed and of the particular tax types on economic growth and employment is that a shift from direct taxes to indirect taxes i.e. from income taxes to consumption taxes is recommended, as it can have a positive effect on growth rate. Results of economic simulations confirm this, albeit they quantify the growth impacts differently (Myles 2009). Results of the Commission's model also point out that a shift in revenue from labor-income taxes which account for 1% of GDP to consumption taxes exerts a positive influence on growth and employment. The positive effect is stronger in the short term if the Member States implement the tax structure reforms one by one, as it can help them acquire a competitive edge over each other. At the same time, in the long term the desirable structural change is advisable in the entire Eurozone, as it would trigger a 0.25% increase in employment and real GDP in the long run (European Commission 2008). Arnold et alia studied 21 OECD states and the growth-friendly nature of their tax structures between 1971 and 2004. Their conclusions confirmed the theoretical assumptions that property taxes (in particular, real estate tax) and consumption taxes are the most growth-friendly taxes. As opposed to this, the most distorting effect was exerted by corporate and income taxes (Arnold, 2008; Arnold et al. 2011).

After this overview of the theoretical and empirical conclusions, the tax structure change proposed by the European Union - one that would decrease labor-income taxes - no longer seems a coincidence. The recommendation of the "Europa 2020" long-term economic strategy document in this matter is as follows:

"Where taxes may have to rise, this should, where possible, be done in conjunction with making the tax systems more 'growth-friendly'. For example, raising taxes on labor, as has occurred in the past at great costs to jobs, should be avoided. Rather Member States should seek to shift the tax burden from labor to energy and environmental taxes as part of a "greening" of taxation systems."(European Commission 2010:29)

At the same time, we must point out that albeit theory and empirical findings can help determine a direction of tax structure reforms which would have favorable impact on growth and employment, this doesn't mean there is one correct solution only. Some goals and criteria

phrased in optimal taxation theories often contradict each other, e.g. growth-friendliness and justice. In the next sections we examine whether the EU states in the pre-crisis and post-crisis periods witnessed any of the tax structure changes which are deemed favorable by theoretical discourses, models and simulations i.e. whether any shift from direct taxation to indirect taxation can be observed. Then we analyze the data in detail.

3. EU taxation trends

3.1. Tax structure reforms in the European Union pre- and post-crisis

Based on Doris Prammer's study in 2011, it seems it cannot be stated clearly about the pre-crisis period (2001-2007) that EU countries, in line with the recommendations, decreased the ratio of income and capital taxes in the budget revenues or increased the ratio of consumption taxes, environmental taxes and real estate tax (Prammer 2011). We can get a more accurate picture if we divide the EU27 states into two groups. In the EU12 of the old Member States, labor-income taxes decreased and consumption taxes increased, but capital taxes also climbed slightly. As opposed to this, states in the EU15 group reduced consumption taxes, but raised capital taxes.

To the crisis which escalated in 2008, the European Union attempted a coordinated response action which was meant to increase aggregate demand in 2009 and to a lesser extent in 2010, through a primarily expansive fiscal policy. Based on the Commission's publication of 2011 which summarized the tax reform trends in the European Union in H2 2010 and H1 2011, it seems a need for tax consolidation arose in 2010 and in numerous countries in 2011, as 24 of the 27 Member States were affected by the excessive deficit procedures in 2011 (European Commission (2011b)). The rupture came in 2010, when several countries still implemented expansive fiscal policies aimed at boosting demand, while consolidation measures through increasing revenue also gained more ground. In 2011, almost all the Member States attempted to increase their tax revenue by raising tax rates, broadening the tax base or implementing special regimes (some countries, though, handled the consolidation actions rather through interventions related to expenditure). In the EU27, average tax burden did not change from 2009 to 2010 (representing 39.8% of the GDP), but this value did increase by 2011. Most Member States increased personal income tax in this period: Greece, France, Ireland, Latvia, Luxembourg, Portugal, Spain and the United Kingdom did so by raising the rates, and 12 countries broadened the tax base and implemented special regimes. That is, the trend characterizing both the EU12 and EU15 states i.e. decreasing labor-income

taxes stopped. In 2010-2011, fourteen EU Member States raised the VAT rate and 22 the excise duty, most often through increasing the tax rate.

3.2 Labor-income taxes

In 2013, labor-income taxes amounted to 14% of the average GDP in the EU28. The tax level was somewhat higher in Germany, Austria and Netherlands (16.7-16.9% of GDP), but this trend - except for the oscillations during the crisis - is downward in Germany, upward in Netherlands and stagnating in Austria. In V4 countries, the level is somewhat lower (Poland 12.2%, Slovakia 13.8%, Hungary 13.4%), except for the Czech Republic (15.6%); but the trend, with some fluctuations, has been generally stagnating in the last decade.

3.2.1 Personal income tax

The highest personal income tax rate expressed in percentage on average in the EU Member States dramatically declined between 1995-2007 (from 47.4% in 1995 through 44.8% in 2000 to 39.2% in 2007), but it has practically stagnated ever since (38.9% in 2013). Personal income tax revenue represented 9.4% of the state budget on weight average in 2012 in EU28. In this, significant differences were registered between the various Member States; the two extremes are Denmark at 24.5% and Slovakia at 2.6%. Germany, Austria and Netherlands reported values dispersed around the EU average (+/-1.5 %), while V4 states all fell significantly below the EU average with downward trends; one of the reasons for this, in addition to the different economic policy approaches, was that the flat-rate personal income tax system implemented by several V4 countries was launched in Hungary in 2011.

1 Personal income tax as a per cent of GDP (%)

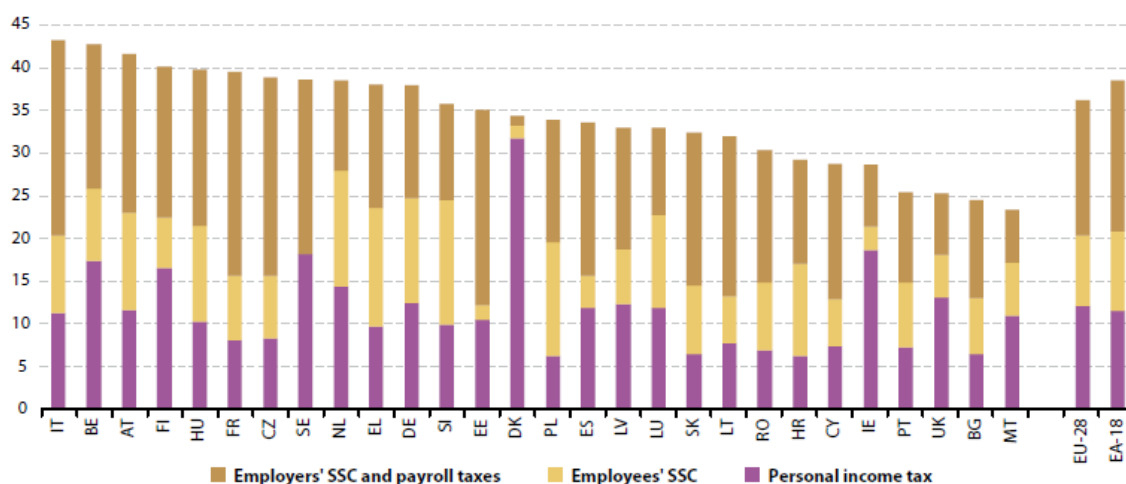
	2004	2005	2006	2007	2008	2009	2010	2011	2012
Germany	8.0	8.0	8.2	8.6	9.0	9.1	8.3	8.4	8.8
Austria	10.1	9.5	9.6	9.8	10.4	9.9	9.8	9.8	10.1
Netherlands	6.0	6.6	6.9	7.4	7.2	8.6	8.5	8.1	7.7
Hungary	6.6	6.6	6.8	7.3	7.7	7.4	6.5	4.9	5.4
Czech Republic	4.7	4.4	4.2	4.3	3.7	3.6	3.5	3.7	3.8
Slovakia	2.7	2.6	2.5	2.6	2.7	2.4	2.3	2.5	2.6
Poland	3.6	3.9	4.6	5.2	5.3	4.6	4.5	4.5	4.6
Weighted average in EU28	8.9	9.0	9.2	9.3	9.4	9.3	9.1	9.1	9.4

Source: Eurostat, 2014:189

3.2.2 Social security contributions, taxes

Social security contributions account for a higher ratio in terms of income to GDP in most EU Member States, than personal income tax (Denmark, already mentioned, is a striking exception). According to calculations of the European Commission, average personal income tax burden declined in the EU, while social security contribution and tax to total wage cost (levied both on employers and employees) climbed slightly between 2000 and 2012. In the V4, total tax burden stagnated, as in Poland, or dropped. In Slovakia and Hungary, employer costs considerably decreased; this attenuation was compensated by the Hungarian budget partially by increasing revenue from employees' social security.

1: Breakdown of actual tax burden on labor income (%)



Source: European Commission (2014): Taxation trends in the European Union. p. 29

Explanation: dark brown: "Employers' SSC and payroll taxes", light brown: "Employees' SSC", purple: "Personal income tax"

3.3 Capital income taxes

3.3.1 Corporate tax

The level of adjusted top statutory tax rate on corporate income mostly hasn't change in EU Member States since 2010; in 2014, it was 23.1% on average, but a downward trend can be observed in terms of the data series for the last 15 years. Germany decreased the highest corporate (adjusted) tax rate in three phases (1998, 2000 and 2008-ban) from 56% to 30%, meeting the requirements of an economic growth-incentive tax system, while in Austria and Netherlands this rate is 25%. In V4 countries, this corporate burden (19% in the Czech

Republic and Poland, 19% in Slovakia before 2012, currently 22%, and 20.6% in Hungary) lags behind the EU average (Eurostat 2014:36).

3.3.2 Levies on the financial sector

The economic crisis significantly increased the number of Member States where the financial sector contributes to the state budget in some form of “solidarity tax” (transaction duty, banking tax, etc.). Such countries are Austria, Belgium, Cyprus, Denmark, United Kingdom, France, Hungary, Germany, Portugal, Slovakia and Sweden). However, this tax burden is quite varied in terms of tax base, rate, and timing (temporary or permanent levy), as well as weight (Prammer 2011; European Commission 2013).

3.4 Property taxes

Among property taxes, we shall examine mostly real estate tax, as this is the tax type which has the least distorting effect on economic growth. As a general trend in the EU, real estate tax was introduced or increased after the onset of the crisis to compensate for the decrease in consumption and other tax revenue (Eurostat, 2011; Eurostat, 2012; Prammer, 2011). However, some Member States had reported significant revenues from this source even before the crisis (in 2007): 2.7% of GDP in Denmark, 4.2% in the United Kingdom, 3.2% in France (European Commission 2013). In V4 countries and core Eurozone countries, revenue from this source, expressed as a percentage of GDP, varied between 0.4 and 1.2% (0.9% in Germany, 1.1% in Netherlands, 0.5% in Austria) (European Commission 2013).

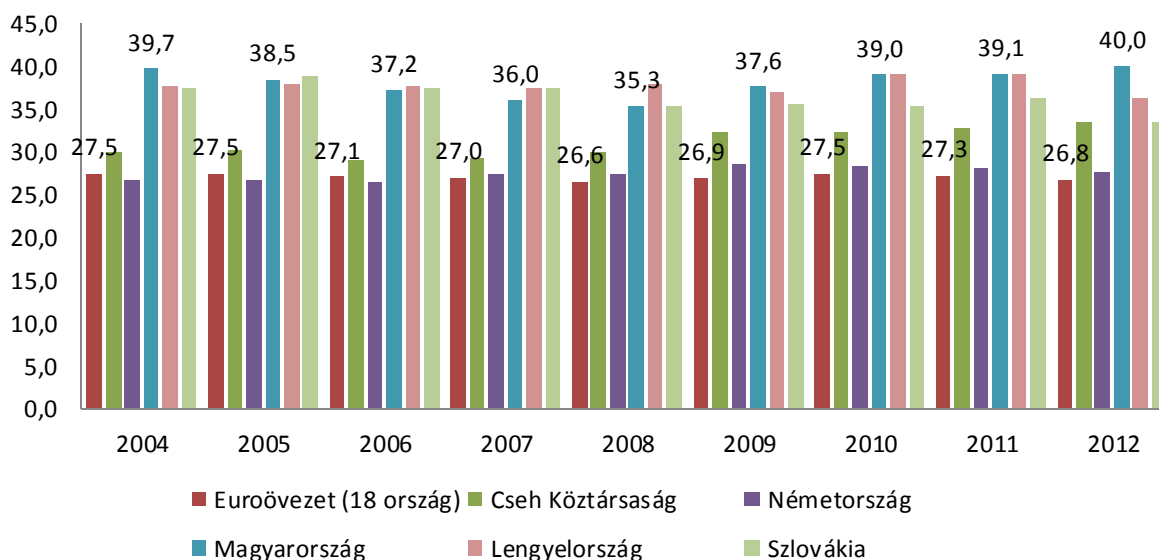
3.5 Consumption taxes

As discussed before, theoretical literature on the impact of consumption taxes suggested that one of the most important characteristics of this tax type is that they had a much milder distortive effect on intertemporal decisions of economic players than labor-income taxes (Prammer 2011).

In Hungary, consumption taxes represent 40% of total tax burden which is the 5th highest value in the European Union, according to a 2014 Eurostat report (Eurostat 2014). The characteristic trend in the EU is that countries that joined the Union from 2004 give a much more important role to indirect taxes such as excise duty or value-added tax (VAT) which are imposed on consumption. Of the V4 countries and Eurozone core countries, used

for comparison, Hungary reports the highest consumption tax ratio of the total tax burden. In Poland, this ratio is roughly 37%, in the Czech Republic and Slovakia around 33%, while in Germany and Austria, it is 28%. Overall, this data follows the European trends, but Hungary reports a higher figure not only compared to core economies, but also to its direct regional partners.

2: Consumption taxes to total tax burden, 2004-2012



Source: Authors' compilation based on the Eurostat: Structure of taxes by economic function database (Dark brown: Eurozone, Dark green: Czech Republic, Purple: Germany, Blue: Hungary, Pink: Poland, Light green: Slovakia)

The implicit tax rate (ITR) on consumption⁹ (Hungarian Central Statistical Office 2010) consists of four major components based on a Eurostat breakdown:

- VAT component,
- tobacco and alcohol component,
- energy component,
- others.

The implicit tax rate on consumption in Hungary is characterized by a similar structure as V4 countries, Germany, Austria and Netherlands: VAT accounts for roughly two thirds of ITR, while the rest is shared by the other three components in a variable proportion. Albeit the European trend suggests ITR stabilization, in Hungary it increased 1.2% in 2012, while in Slovakia and Poland it dropped 1.6 and 1.5%, respectively.

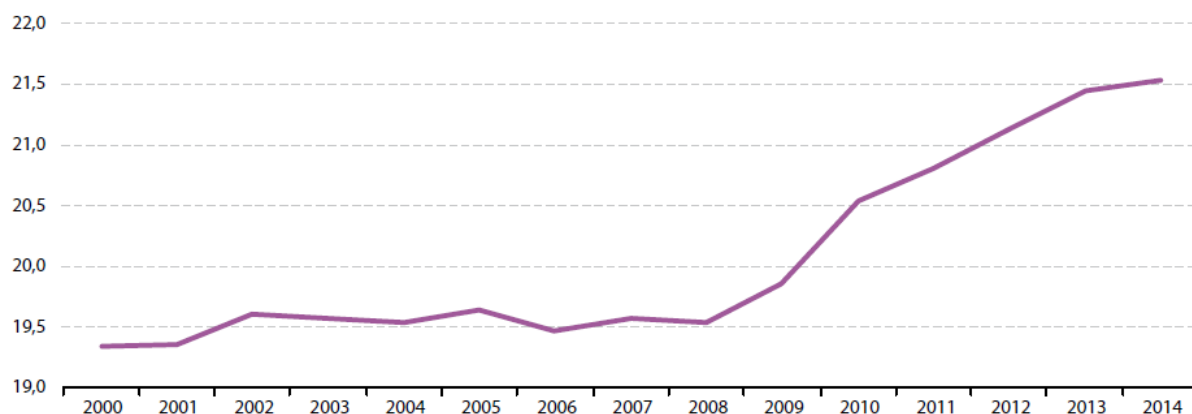
⁹ "Implicit tax rate on consumption can mean the ratio of revenue from consumption taxes to final consumption expenditure of households." (KSH 2010:4)

Using the methodology of Eurostat and the Taxation and Customs Union directorate of the European Commission, we examine consumption taxes by classifying them into two major groups.

3.5.1 Value-added tax

Average VAT rate in Europe has been virtually unchanged in the Member States in the 2000s, and was around 19.5% even after accession of new Member States. However, in 2008, the economic crisis triggered a drastic surge of VAT rates in Europe: in the 2008-14 period, 20 Member States increased the VAT rate (Eurostat, 2014). As a result, by 2014 the average VAT rate of the EU28 exceeded 21.5% in spite of the fact that in the triad of Germany, France and the United Kingdom, only the latter one raised the VAT significantly under the effect of the meltdown (from 17.5% to 20%) (Eurostat, 2014:26). The upward trend of VAT rates reflects the revenue boosting intention of European governments, as the EU's fiscal policy focused on decreasing the government deficit to GDP as part of crisis management in this phase of crisis management (Prammer 2011).

3: Evolution of average VAT in the EU28, 2000-14



Source: (Eurostat 2014:25)

Of the countries examined, Hungary reports the highest volatility in terms of standard VAT rate. After its accession, VAT declined to 20% in 2006, then after 2008, it rose to 25%, which was followed by another two-percentage point hike in 2012 (27%). As a result, currently Hungary has the highest standard VAT rate among European countries. The European upward trend can be observed in each of the Visegrad countries, but with fewer and smaller adjustments. Of the Visegrad Four states, Hungary is followed by Poland as the state

with the second highest VAT rate at 23%. The 22% VAT rate applicable from the early 2000s was raised in 2011. In the Czech Republic, a 19% VAT rate was applicable in the pre-crisis years, which climbed to 20% in 2010, then to 21% in 2013. Of the Visegrad Four countries, Slovakia reports the lowest standard VAT rate: its pre-crisis 10% rose to 20% in 2011. German, Austrian and Dutch VAT rates are 19, 20, and 21%, respectively. Among the states examined, only Austria and Germany maintained a stable VAT rate before and after the crisis, albeit we must note that the standard VAT rate in Germany rose from 16% to 19% in 2007. Netherlands raised its VAT rate from 19% to 21% in 2013.

Besides the standard VAT rates, interesting conclusions can be drawn also from the evolution of preferential VAT rates. Generally they apply to essential consumer goods such as certain types of food, water, dairy and bread. The scope of products with preferential VAT rate varies from country to country, but they follow the same logic. Of the Visegrad Four and Germany, Austria and Netherlands, the lowest preferential VAT rate is practiced in Germany and Netherlands at 7 and 6%, respectively. In some countries, including Hungary, a third, even lower VAT rate applies to medicine, district heating, books and other products. This rate is 5% in Hungary. The other three Visegrad countries and the three core states only use two VAT rates.

As an increasing proportion of tax revenue comes from the rising value-added taxes, examining the so-called VAT gap is quite relevant. By definition, the gap is the difference between total statutory VAT payment liabilities and actual payments received (Center for Social and Economic Research, 2013). The value is influenced by several factors, such as the institutional environment and the VAT rate (the higher the VAT, the more it can induce certain economic players to engage into VAT fraud and avoidance), as well as the economic environment in the recession. The econometric model of the issue confirmed the expectations: during recession, the VAT gap is the highest when VAT rates are high and the tax administration and other institutional environment is weak. Based on this, countries in the Eurozone enjoy a better position than the other Member States which joined later. The fact that increasing the rate widens the gap means that the European upward trends since 2008 raised the VAT gap by 5% in the Member States of the European Union (Eurostat, 2014:27).

In Hungary, VAT gap represented 3.7% of GDP in 2011, which means EUR 3,700 million. This was 30% of the total theoretical VAT revenue (Center for Social and Economic Research, 2013). In the pre-crisis years, a downward trend could be observed from 27% in 2005 to 24% in 2007. Data shows that the VAT rate changes in the last few decades had no significant impact on the gap, and the economic depression was reflected to a much lesser

extent than in other EU states. Nevertheless, Hungary reported a consistently high VAT gap in the last decade, which places the country at the tail-end in the European Union in terms of VAT collection efficiency. Switching over to on-line cash registers intends to increase VAT revenue and ensure a decline in VAT fraud by increasing the efficiency of administration.

In Slovakia, a Eurozone member, the gap was 4% of GDP in 2011, and 37% of the total possible VAT revenue was lost. Albeit the VAT rate hasn't increased significantly in the country, the gap did: in 2008, the gap was only 30% between the total potential VAT revenue and actual payments. In the Czech Republic, in 2011 the gap was measured at 2.7% of GDP (EUR 4,241 million) and 28% of total potential VAT revenue. This follows the Hungarian and Slovakian pattern where the VAT gap is considerable both compared to the GDP and the theoretical maximum revenue. Poland reported a VAT gap of 1.5% of GDP and 15% of total theoretical VAT revenue. Albeit the latter figure is only half of the Hungarian one, it is still a sign of significant decline after the pre-crisis 2% in 2007. Poland stands out of the Visegrad countries with its good performance, in spite of the negative trend.

The fact that Slovakia is the weakest performer of the four countries, in spite of being a Eurozone member, shows that it struggles with significant institutional deficit which renders it unable to collect roughly 40% of its total potential VAT revenue.

In a comparison of the region with the more developed states, the Visegrad Four lag behind. In Germany, VAT gap is 1% of GDP and 12% of total potential VAT revenue. Austria falls slightly behind this value, where the gap is 1.2% of GDP and no more than 13% of potential maximum VAT. Of the countries studied, Netherlands reports the best indicators: VAT gap is only 0.7% of the GDP and only 9% of total potential revenue.

2: VAT gap in the countries studied, 2000-2011

Country	VAT gap to GDP											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Hungary	2.5%	3.1%	3.3%	2.9%	2.7%	3.1%	2.8%	2.6%	2.8%	3.0%	3.5%	3.7%
Poland	1.4%	1.8%	1.6%	1.5%	1.5%	0.8%	0.4%	0.2%	0.8%	1.3%	1.1%	1.5%
Slovakia	2.6%	2.7%	2.8%	2.0%	2.4%	2.0%	2.8%	3.0%	2.9%	3.8%	4.0%	4.0%
Czech Republic	2.6%	2.5%	2.5%	2.8%	1.0%	0.8%	1.2%	1.5%	2.1%	2.3%	2.9%	2.7%
Germany	0.9%	1.1%	1.0%	1.0%	1.0%	1.0%	0.9%	1.1%	1.0%	0.8%	1.0%	1.0%
Austria	0.8%	0.9%	0.7%	1.0%	1.0%	1.0%	1.2%	1.1%	1.1%	0.8%	0.9%	1.2%
Netherlands	0.7%	0.6%	0.5%	0.5%	0.3%	0.2%	0.2%	0.0%	0.3%	0.7%	0.3%	0.7%
VAT gap to potential VAT revenue												

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Hungary	22%	28%	30%	26%	23%	27%	27%	24%	26%	26%	28%	30%
Poland	17%	21%	18%	18%	17%	9%	5%	2%	9%	15%	12%	15%
Slovakia	27%	27%	28%	21%	24%	20%	27%	31%	30%	36%	38%	37%
Czech Republic	30%	29%	29%	31%	12%	10%	16%	19%	23%	25%	29%	28%
Germany	11%	14%	13%	13%	13%	13%	12%	14%	13%	10%	13%	12%
Austria	9%	11%	8%	11%	11%	11%	14%	13%	13%	9%	10%	13%
Netherlands	9%	8%	7%	6%	3%	3%	2%	0%	4%	9%	3%	9%

Source: authors' compilation based on (Center for Social and Economic Research, 2013)

3.5.2 Excise duties

Excise duties represent a smaller, but still significant portion of consumption tax revenue compared to VAT. The two highest non-VAT components are excise duty on tobacco and alcoholic products, and excise duties on energy carriers and power. Tobacco and alcohol excise duty is 8% of implicit tax rate on consumption on average in the EU, while petroleum product taxes account for 16%. In all the three major groups, the various products are associated with various degrees of tax burden. As the comprehensive presentation and comparison of the three major groups transcends the scope of this analysis, we shall limit the analysis to comparing the tax revenues. But we must emphasize that excise duty rates changed both before and after the crisis. Before the depression, the tax harmonization actions of the newly joined countries were the cause, while after the crisis, the hike was driven by the aforementioned governmental revenue boosting intention (Prammer 2011).

In Hungary, tax revenue from these excise duties to GDP hasn't changed significantly since the accession. Based on the Eurostat database¹⁰, they represented 3.3% of GDP in 2004 and 3.5% in 2012. Contrary to the stagnation of this revenue to GDP in Hungary, the Czech Republic witnessed an increase starting from 2004 (from 2.5% to 2.8% in 2007), but the pre-crisis level of revenue hasn't been achieved after the economic depression. After the decline, the annual revenue from excise and consumption taxes has varied around 2.2-2.3% in this country. Polish and Slovakian revenues followed a similar path: starting from 3.8 and 2.9%, respectively, they reached top values in the pre-crisis years at 4.2 and 3.5%, respectively, then after the meltdown in 2008-2009, they stagnated at the initial 3.8 and 2.8% values in 2012, respectively.

¹⁰ Main national accounts tax aggregates

http://epp.eurostat.ec.europa.eu/portal/page/portal/product_details/dataset?p_product_code=GOV_A_TAX_AG
(26.06.2014)

Developed economies were characterized by a constant and slow decrease from 2004, except for Netherlands, where excise duty revenue to GDP was between 1.4 and 1.6% in the last decade.

3.6 Environmental taxes

The European Union makes considerable effort to drastically reduce greenhouse gas (GHG) emission. This endeavor was phrased in the so-called “2020 package”; according to the target figures of this program, by 2020, GHG emission in the EU must be reduced 20%, energy use efficiency must be increased 20% and renewable energy use must increase 20% (European Commission 2012b).

The purpose of environmental taxes is to increase the cost of proven environmentally polluting activities and motivate economic players to reduce pollution. Roughly 77% of environmental taxes in the European Union is represented by energy and fuel excise duty, as supplemented by variable special tax types in the various Member States (Eurostat 2014). One third of the Member States raised diesel tax since 2012; Spain levied a tax on energy production which generates nuclear waste, while Hungary and Italy increased the corporate tax of energy suppliers. However, according to the report on European tax reforms, these measures do not necessarily attain the desired effect, as they do not offer direct incentives to reduce energy consumption and can discourage investments in the sector (European Commission 2013). Germany and Austria implemented tax on airline tickets, and Germany imposed a supplementary tax on nuclear energy (Prammer 2011). Netherlands, Slovakia and Austria intend to make vehicle taxation “greener” by factoring in engine performance (as in Slovakia) and noxious emissions in the tax burden.

In 2012, environmental tax revenue represented 2.5% of the GDP in Hungary, a -0.5% change compared to 2000. Our country witnessed a downward trend in the last decade; while environmental tax revenue accounted for 2.9% of the GDP in 2004, it gradually declined to its level in 2012. A similar -0.5% drop of revenue was reported in Slovakia in the 2000-2012 period, while this revenue stagnated in the Czech Republic and climbed 0.4 percentage points in Poland. In Germany and Netherlands, GDP-proportional revenues from environmental taxes decreased by -0.2% in each.

4. Conclusion

In H2 2011 and H1 2012, consolidation processes through revenue boosting continued in the EU states, also on account of the fact that 21 member states were under an excessive deficit procedure in July 2012 (European Commission 2012a). Personal income tax continued to increase, but targeted tax facilities for special groups (generally the vulnerable categories of the labor market) also appeared, which increased the progressivity of personal income tax. Roughly half of the Member States raised their value-added tax rate either by pushing up the standard rate or increasing the preferential rates; excise duty raises continued as well. At the same time, several states cut corporate tax rates, albeit Greece, France and Portugal sent up their marginal tax rates (typically affecting large corporations).

In H2 2012 and H1 2013, indirect taxes continued to climb, but this was not accompanied by a decrease in labor-income taxes (European Commission 2013). Another persistent phenomenon were the higher personal income taxes associated with an increase in the level of progressivity, often in the form of tax facilities granted to targeted groups. Corporate taxes were reduced most often by narrowing the tax base. These cuts were aimed primarily at attenuating the negative impact of the crisis on private sector investments. Almost half of the Member States raised their property taxes (often progressively), but consumption and environmental taxes increased, too, in this period.

Overall, the 2008 global economic crisis significantly reshaped the trends of tax structure changes observed before its onset. While the pre-crisis period was characterized by the decreasing weight of labor-income taxes in public revenues both in the EU12 and the EU15, after the depression the need for fiscal consolidation reversed the previous process. Increasing one of the most growth-friendly tax categories, namely consumption taxes (both by raising the rate, broadening the tax base and implementing special regimes), also contributed to reducing the budget deficit. This means that the consumption tax hikes were not necessarily accompanied by the attenuation of the role of taxes with significant distortive effect on growth. Corporate tax reduction was utilized as an investment incentive in many Member States, but certain sectorial taxes were also introduced in parallel with it (such as newly implemented tax levies on the financial sectors).

As for Hungary, implementation of the single-rate personal income tax system and VAT and excise duty raises are in line with the Commission's recommendations regarding the tax structure changes supportive of growth. But in the case of VAT, it is advisable that the implementation of electronic cash registers and other measures generating a 'whitening' effect should be coupled with placing stronger emphasis on the reduction of tax evasion and tax

avoidance so as to be able to pursue the attenuation of the VAT gap, which is basically higher in the V4 than in the old, more developed states of the European Union.

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