ACTA UNIVERSITATIS AGRICULTURAE ET SILVICULTURAE MENDELIANAE BRUNENSIS

Volume LX 39 Number 7, 2012

IMPACT OF STANDARD RATE OF VAT ON TAX MIX IN EU 27

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Received: August 27, 2012

Abstract

ŠINKYŘÍKOVÁ, T., SOUKOPOVÁ, J.: *Impact of standard rate of VAT on tax mix in EU 27.* Acta univ. agric. et silvic. Mendel. Brun., 2012, LX, No. 7, pp. 369–378

The Value Added Tax (VAT) is one of the key resources within tax collection and therefore VAT effectiveness and VAT complexity represent one of the current world topics. Standard rates of VAT may and may not be the simple key to define whether VAT is important in the tax mix or not. This paper focuses on the question whether the amount of the VAT rate has an impact on the share of VAT in the tax mix. The VAT share on total taxes is studied in connection of average and median standard rates applied so as to answer the question: "Do the countries with higher share of VAT in the tax mix set its standard rates of VAT beyond the average of EU 27?" The paper examines this issue using data EU member countries, especially EU 27, in years 1995–2010.

VAT, effectiveness, standard rate of VAT, tax mix, average, median

The Value Added Tax (VAT) is one of the most successful and prodigious phenomena in the contemporary fiscal structures. Developed as late as in 1950's, it has rapidly become the most widespread consumption tax in the world, currently being deeply entrenched in the tax systems of more than 140 countries (OECD, 2008). Despite the strong harmonization of taxes within the European Union (EU), especially in a field of indirect taxes, VAT rates are far from unification. Each member state of the EU sets its own VAT rate (rate of VAT) according to Council Directives, especially 2006/112/EC. The standard rate may not be less than 15% (Article 98). Thus, the member states are not limited by tax brackets, but only by the minimum rates.

It can come into being such differences between the (standard) rates applied, such as Hungary (27 % VAT) vs. Luxembourg or Cyprus (15 % VAT)[1]. Each member state can freely decide the rate of VAT applied while observing different goals, e.g. budgetary – including the increase of tax income, the stimulation of the aggregate demand or the level of consumption, increasing or decreasing the relative accent on indirect taxation (in the overall tax burden) etc. Furthermore, to mitigate the regressive impact of indirect taxation, the reduced rates are applied. Does the VAT, in result, present the comparable share of tax revenues within member states?

Changing the rates of VAT so as to raise tax revenues expected, as the answer to the economic crisis and the lack of revenues or changes in rates of VAT could modify the tax mix (Owens and Battiau, 2011). Several studies focused on the level of consumption, in a field of temporary reducing the VAT rates (Barrell and Weale, 2009; Crossley et al., 2009). Temporarily, the VAT cut has an impact on consumption, but with increasing rates afterwards the reaction of the demand will offset this impact in the long run. As Blundell (Blundell, 2009) concluded, the VAT has the potential to be a very successful (but) short-run stimulus. The changes of VAT rates influence also the differentiation in the rates across the Member states. As noted Široký and Kovářová (2011) the differences between the highest and the lowest rate applied tends to decrease.

1 From March 2012, Cyprus standard VAT rate elevates to 17%.

Using VAT is also relatively effective way to collect revenues, and to raise collection of total taxes. Therefore countries have tendencies to "exploit" VAT collection by replacing others, less effective taxes (Keen and Lockwood, 2006).

Indirect taxes, including VAT, have over last years tendencies to gain more importance in total tax revenues in spite the fact that VAT actually collected represents about 50 % of theoretical VAT revenues, if there is no evasions and all final consumption was submitted to standard rate (Taxation trends in the European Union, 2012).

Communiqué from Lucerne Conference (Consumption tax trends 2010: VAT/GST and excise rates, trends and administration issues, 2011, annex D) shows the will to maintain, modernize and simplify the VAT system of OECD members. The revenue share of VAT on total taxation in OECD countries has risen over 40 year period (18.6% of total taxation in 2010 compared to 13.6% in 1965). Thus, the growing importance of VAT on total taxes does not concern solely the European Union and it is also true for recommendation to simplify VAT system.

Atkinson and Stiglitz (1971), shows that a simple rate system would not be the most efficient way to tax consumption. Certain differences, mostly based on empirically estimated demand function could decrease the dead weight loss and thus, increase the effectiveness. The principal conclusion they have reached are classification into commodity groups for taxation purposes and the optimal taxation is one that taxes more heavily goods which have a low income elasticity of demand. This, in principal, is assumed to created an optimal tax structure, (European Commission, 2007) but it requires the tax authority to be able to estimate regularly the price elasticity for all goods (new goods on the market can affect the price elasticity on already existing goods on the market etc.)

The common implication of the above-mentioned studies are several: the decision of applying the concrete rate of VAT is the result of different policies; European harmonization constraint, budgetary goals, the impact on the consumption, the effectiveness and the equity issues, linked with the lower rates of VAT. The optimal tax system is practically unachievable, nevertheless, current VAT system needs, in certain way, to be more simple than it is now; the current system is far from uniform (European Commission, 2007) and thus, not compatible with applying the Origin principle. The Origin principle, one of the key goals embodied in the 1st directive; 67/227/EC[2], would require the closest harmonization of tax base, so as to different goods and services would be submitted to the same kind of VAT rate within member states. Furthermore, this would require the rates of VAT (standard, reduced, supper-reduced, zero and parking, if any) to be more coordinated.

The Green Paper on the Future VAT has been issued by European Commission so as to trigger and encourage the public debate on the future of VAT system. Several questions are formulated, mostly in connection with a need of further harmonization, i.e. to what extend the harmonization is needed so at to support the single market, based on taxation in country of origin (COM (2010) 695).

The results of broad public debate are presented by the Communication on the future of VAT (COM (2011) 851). The Origin principle is seen by Member States as politically unachievable as for the stakeholders this goal is not achievable in foreseeable future. "Thus the Commission has come to the conclusion that there are no longer any valid reasons for keeping this objective, and will purpose that it should be abandoned," (COM (2011) 851). Nevertheless, broadening the tax base, so as to improve the effectiveness of the VAT, remains one of the key priorities. The importance of standard rates would increase and the coordination on the ground of standard rates would predicate more about coordination of VAT system of Member States.

The aim of the paper is to answer the key question whether the amount of the rate of VAT has an impact on the share of VAT in the tax mix. The share of VAT revenues as a proportion of the tax mix will be studied in connection of standard VAT rates. Do the countries highly related on VAT (within tax collection) set its standard rates beyond the average? Are the standard rates the key factor to define the tax collection (as a proportion of the tax mix)? Or, as a result of uncoordinated tax base, has the rate of VAT only little impact on a revenues side?

Matthews (2003) studied VAT revenues in connection of standard VAT rates and posed the key question if, in current VAT system, Laffer curve actually exists. If there is a value of VAT rate from which the increase in rates would bring less positive impact on raised revenues caused by higher rates than the negative effect from broadening the tax base and tax evasions. The results actually proved the existence of VAT Laffer curve and, that the "optimal" rate for members of EU would vary around 18–19.3 %.

The simple rule "more important VAT is, (as VAT revenue on total taxes), the higher standard rate is applied" would not be true since the standard rate does not define the tax revenues and if it does, the effect of Laffer curve appears.

Thus, the hypothesis that reflects the possibility mentioned above the, is: **The amount of standard rate of the VAT has clear implication on the share of VAT in the tax mix.**

2 Council Directive 2006/112/EC stipulates the current system of Destination principle to be transitional; the Origin principle shall be introduced.

In the first section, EU Member states will be divided into three groups, where the 1st group will include the Members with highest and the 3rd one with the lowest VAT share on total taxes. Than, these groups will be studies by the criteria of standard rates. The main question is, whether the group with higher share of VAT sets its standard rate also above the average and vice versa.

This paper will demonstrate, that if the countries rely heavily on VAT (compared to all tax mix), it doesn't imply that the standard rates are set up above the EU average.

MATERIALS AND METHODS

The dependence of the amount of rate of VAT on the share on VAT in the tax mix is studied from the other side. First is analyzed the share of VAT in the tax mix and is used cluster analysis. All members of EU were classified onto three groups by nine members, according the average share of VAT on total taxes (in %), during the period from 1995 to 2010. This period elected, 16 years, is the longest possible to cover all members of EU 27. Earlier data aren't available for EU 27 members, since the VAT weren't introduced in several cases. Furthermore, in earlier period, introducing of VAT and modification of tax system in new member countries could cause distortions and would lead to the misinterpretation. Thus, the 1st group represents the countries with relatively highest share of VAT in the tax mix, the 2nd group consists the countries with medium share of VAT in their tax mix and finally, the 3rd group represents the countries with relatively low share of VAT in the tax mix. The classification is based on average VAT share on total taxes for all covered period. Dividing into three groups was elected so as to simplify and precise the analysis.

For each group of countries, selected in a function of relative importance of VAT, the average and median of standard VAT rate is calculated. Than, the rates of VAT were compared within groups to answer the key question: Do the members of EU which rely relatively highly on VAT set its standard rates above the average?

As mentioned above, due to complexness of current VAT, the Standard rate is not the key factor defining the VAT collection. As a result, the group with the highest share of VAT on total taxes would not be the group with the highest standard VAT rate applied.

The hypothesis H is the following: The amount of standard rate of VAT has clear implication on the share of VAT in the tax mix. So as to approve the hypothesis, the average value of standard rate will be calculated for all the 3 groups of 9 countries. Hypothesis will be rejected when the rate of VAT and the share of VAT on total taxation amount will be not directly proportional. Hypothesis will be approved, when the rate of VAT and the share of VAT on total taxation amount will be directly proportional.

The data about VAT share on total taxes was obtained from European Commission: Taxation trends in European Union (2012). VAT revenues are presented in % of total taxation. The calculation is provided every year since 1995 to 2010.

Information about standard rates for all cover period and all member countries are based on data published by European Commission.[3] Standard rates are calculated by the frequency of 1 year, from 1995 to 2010. The time period elected was decided by criteria of the longest period, but covering the rates of VAT in (almost) all member countries.

In some Member countries[4] the changes in standard rates of VAT took place (several times) during one calendar year. Thus, only the rate that was applied for relatively longest period within a year was taken into account. There is an exception of year 2012, where the rate applicable in the first month was taken into account. Concerning the 27 today members states, the VAT is calculate since this tax was introduced, regardless the membership to EU (typically the post-communist countries). Their VAT is calculated for the period when they weren't the EU member, which was true mainly from 1995 to 2003.

RESULTS

The calculation will cover the rates of VAT of all European countries, divided into three groups, where the criterion will be the share of VAT on total taxation and the average VAT ratio on total taxation is calculated for the period 1995–2010 and the members are ranked and then divided into following groups, where every group has 9 members:

1. The 1st groups with the highest ratio includes: *Bulgaria, Estonia, Ireland, Cyprus, Latvia, Lithuania, Portugal, Romania* and *Slovak Republic*. Six out of nine states are post-communist countries, where the relative importance of indirect taxes is higher, comparing to all EU current members; 42.3 % for post-communist countries, compared to 39.2 % for EU 27, in 2005, or 40.9 % compared to 37.7 % in 2009.
2. The 2nd group, with the medium share of VAT on total taxation, is represented by *Czech Republic, Denmark, Greece, Hungary, Malta, Austria, Poland, Slovenia* and *Finland*. There are 5 new members out of 9 countries. None of the EU 6 is present.

3 Available at: European Commission, Taxation and Customs Union/VAT/VAT Rates: http://ec.europa.eu/taxation_customs/resources/documents/taxation/vat/how_vat_works/rates/vat_rates_en.pdf.

4 The changes in rate of VAT took place several times during one calendar year in 7 countries since 1993, inc. Estonia, Germany, Greece, Hungary, Lithuania, Slovak Republic, Sweden

3. The 3rd group, with the smallest share of VAT on total taxation is represented by *Belgium, Germany, Spain, France, Italy, Luxembourg, Netherlands, Sweden* and *United Kingdom*. Every founding member is thus present and can be characterized as more relying on direct taxes (their share on total taxation is, on average, by 2.25% higher than for EU 27 in 2009), see the Table I.

A. VAT share on total taxation

VAT share on total taxation according to 3 defined groups of EU member states is specified in Tabs. I, II and III.

The average share of VAT on total taxation for all the period covered is 24.6 %. The most elevated share of VAT is typical for Bulgaria (28.6 %) and Estonia (26.5 %). The least elevated share of VAT within this group is represented by Cyprus (21.9 %).

Importance of VAT, as visible from the average and the median, tends to grow; the average share is higher by 16.3 % in 2010 than in 1995. The median is not constantly up or below the average, it oscillates around. Furthermore, the median calculated for all covered period is the same as arithmetic average. This means the values are close to normal distribution and are not systematically asymmetric and inclined to left or right side.

Average VAT share for all covered period is 20.4 % which is by 17.1 % lower than the VAT share of 1st group. The highest average is typical for Malta (21.9 %), Poland and Greece (21.8 %). The lowest share, au contrary, is represented by Czech Republic (18.5 %).

I: *The VAT share on total taxation from 1995 to 2010, the 1st group*

1st gr.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BG	22.5	25.6	22.3	26.3	25.3	26.4	27.4	25.6	27.8	30.3	32.7	34.9	31.1	33.8	31.1	33.7
EE	26.5	27.3	28.0	23.8	23.8	27.2	27.0	27.0	26.5	25.1	28.3	29.6	28.2	24.9	24.8	25.7
IE	21.2	21.6	22.0	22.4	22.2	23.1	23.0	24.7	24.2	24.3	24.8	24.2	24.1	24.6	22.9	22.9
CY	17.2	17.3	17.6	16.7	16.1	18.2	18.7	21.5	24.3	25.4	26.1	27.1	25.5	27.4	26.0	25.8
LV	27.8	26.8	25.0	23.8	23.0	23.9	23.6	23.5	25.3	24.4	26.8	28.1	26.9	23.0	22.5	24.3
LT	26.9	24.9	27.0	25.3	24.9	25.2	25.4	26.0	24.0	22.9	25.0	25.9	27.5	26.6	25.2	29.3
PT	23.4	23.8	23.5	24.1	24.0	24.6	24.2	24.2	24.4	25.4	26.8	26.6	25.8	25.6	22.9	24.8
RO	18.0	18.1	17.3	21.4	19.5	21.4	21.8	25.2	26.0	24.5	29.0	27.8	27.9	28.2	24.7	28.6
SK	20.8	19.3	19.3	20.3	19.3	20.4	21.9	21.2	22.7	24.7	25.1	25.5	23.0	23.6	23.3	22.6
A	22.7	22.7	22.4	22.7	22.0	23.4	23.7	24.3	25.0	25.2	27.2	27.7	26.7	26.4	24.8	26.4
μ	22.5	23.8	22.3	23.8	23.0	23.9	23.6	24.7	24.4	24.7	26.8	27.1	26.9	25.6	24.7	25.7
σ	3.6	3.6	3.6	2.7	2.9	2.8	2.6	1.9	1.5	1.9	2.4	2.9	2.3	3.1	2.5	3.4

Source: Data from Taxation trends in the European Union, 2012, adjusted by authors
Comment: The arithmetic average (mean) (A) and median (μ) are calculated so as to define the average value of standard rate and also, so as to identify, whether the arithmetic average is distorted by extreme values. Standard deviation (μ) is calculated so as to describe the coordination of VAT revenues (Tables I, II, III) (and VAT rates – tables IV, V, VI) within 3 defined groups of EU Member states.

II: *The VAT share on total taxation from 1995 to 2010, the 2nd group*

2nd gr.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CZ	16.8	17.9	17.6	17.6	18.6	18.4	18.1	17.5	17.2	19.5	19.4	18.0	17.7	19.7	20.6	20.6
DK	19.4	19.7	19.8	19.8	19.6	19.4	19.9	20.2	20.1	19.9	19.8	20.8	21.2	21.0	21.2	20.7
GR	21.1	21.2	21.1	20.5	21.2	20.9	22.5	22.7	21.8	21.7	21.5	22.5	22.9	22.7	21.1	23.2
HU	18.4	18.6	19.8	20.2	20.8	22.3	21.1	20.6	21.6	23.5	22.5	20.4	19.9	19.3	21.3	23.0
MA	23.2	23.3	21.9	17.7	19.3	21.0	21.2	20.6	20.6	22.5	24.5	23.8	22.2	23.3	22.9	23.3
AU	18.6	18.9	18.7	18.5	19.1	18.8	17.9	18.7	18.3	18.4	18.8	18.4	18.4	18.2	18.9	18.9
PL	16.8	18.6	20.2	20.1	21.5	21.3	21.0	22.0	22.2	22.8	23.5	24.1	23.9	23.4	23.4	24.5
SI[5]	-	-	-	-	12.5	23.1	22.1	22.6	22.3	22.3	22.3	22.3	22.4	22.8	22.5	22.4
FI	17.4	17.1	18.4	18.0	18.0	17.4	17.8	18.2	19.4	19.6	19.8	19.9	19.5	19.5	20.2	20.1
A	18.9	19.4	19.7	19.1	19.0	20.3	20.2	20.3	20.4	21.1	21.3	21.1	20.9	21.1	21.3	21.9
μ	18.5	18.8	19.8	19.2	19.3	20.9	21.0	20.6	20.6	21.7	21.5	20.8	21.2	21.0	21.2	22.4
σ	2.0	1.9	1.3	1.1	2.5	1.8	1.7	1.8	1.7	1.7	1.9	2.1	2.0	1.9	1.3	1.7

Source: Data from Taxation trends in the European Union, 2012, adjusted by authors

5 The data for Slovenia until 1999 aren't available.

III: *The VAT share on total taxation from 1995 to 2010, the 3rd group*

3rd gr.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BE	15.1	15.3	15.2	14.8	15.7	15.9	15.2	15.3	15.2	15.4	15.7	15.9	16.2	15.8	16.0	16.2
DE	16.3	16.1	16.0	16.3	16.7	16.6	16.8	16.5	16.3	16.4	16.4	16.5	18.1	18.3	19.1	19.1
ES	16.3	16.6	17.1	17.2	18.2	18.1	17.7	17.1	17.7	17.7	18.1	17.8	16.1	15.5	13.5	17.2
FR	17.5	17.8	17.7	17.5	17.3	16.9	16.6	16.5	16.6	16.8	16.8	16.6	16.7	16.5	16.4	16.5
IT	13.9	12.9	12.9	14.3	14.4	15.6	15.1	15.3	14.4	14.4	14.8	14.9	14.4	13.9	13.2	14.7
LU	14.0	13.8	13.8	14.1	14.0	14.3	14.6	14.7	14.9	16.2	16.4	16.1	16.1	16.7	16.8	16.4
NL	16.2	16.6	16.9	17.1	17.3	17.3	18.9	19.1	19.5	19.4	19.2	18.9	19.4	18.5	18.3	18.7
SE	18.9	16.9	17.0	17.1	17.0	16.7	17.6	18.6	18.5	18.3	18.4	18.5	19.1	20.0	20.7	21.3
UK	18.6	19.2	18.9	17.9	18.3	17.9	18.0	18.9	19.6	19.3	18.5	18.0	18.0	17.0	16.5	18.5
A	16.3	16.1	16.2	16.3	16.5	16.6	16.7	16.9	17.0	17.1	17.1	17.0	17.1	16.9	16.7	17.6
μ	16.3	16.6	16.9	17.1	17.0	16.7	16.8	16.5	16.6	16.8	16.8	16.6	16.7	16.7	16.5	17.2
σ	1.7	1.8	1.8	1.4	1.5	1.1	1.4	1.6	1.8	1.6	1.4	1.3	1.5	1.7	2.3	1.9

Source: Data from Taxation trends in the European Union, 2012, adjusted by authors

The share of VAT, as in the previous case, has tendencies to grow; 18.9 % in 1995 compared to 21.9 % in 2010. (It is a rise about 15.9 %).

The median is rather higher than the average, with the exception in 1995 and 2002–5. For most of the period, the VAT share of countries involved rather exceeds the average share.

The average VAT share on total taxation is 16.7 %, which is by 31.8 % lower than within the 1st group. Sweden (18.4 %) United Kingdom (18.3 %) and Netherlands (18.2 %) have the highest share within group. Italy (14.3 %) represents the opposite.

As in previous cases, VAT share on total taxation grows slightly; from 16.3 % in 1995 to 17.6 % in 2010 – this represents rise about 8.0 %.

Until 2001, median exceeds the average. From 2002, average exceeds the median. The most of the values are, since than, rather below the arithmetic average. Before 2001, the situation was the opposite, The VAT share of Luxembourg and Italy "caused the distortion" between average and median. Since 2002, Netherlands and Sweden "pushed-up" arithmetic average above median.

To summarize, all 3 groups have one thing in common – VAT become "more important" in the tax mix, the shift towards indirect taxation continues and this is the case of both types of countries, regardless the initial share of VAT (in 1995).

Prediction of the future of VAT (Taxation trends in European Union, 2011, pp. 36) is also a slight growth of indirect taxes, namely VAT. The reasons, that could be also considered as advantages of VAT are the following: Indirect taxes are less of a drag on economic growth, indirect taxes are friendlier towards capital accumulation, and indirect taxes do not have direct impact on foreign competitiveness.

As far as VAT share and its convergence, closer coordination (during the studied period) is not indicated. The values of 1st and 2nd groups are, nevertheless, below the values of 1995. The oscillation is, however, the prevailing trend – the VAT share on total taxation is not "harmonized" since 1995.

B. The rates of VAT in connection of VAT revenues

Every member state applies one standard rate of VAT. The average rate is 20.9% in 2012 and this average value is comparable to 1st group. Contrarily, 2nd group has, on average, the most elevated rates applied; 22.1%. This is given partially by Hungary, which applies 27 % rate in 2012. The variation of rates is 12 p.p., from 15% to 27%. The results presented in tables IV, V and VI does not include the data by 2011 and 2012, since the VAT share on total taxes is not available to compare with.

Standard rate of VAT represents, on average (EU 15 in 2000), 69 % of a taxable base. (Mathis, 2004) But their share vary greatly among member states; Denmark, with 100 %, eight other countries with values from average to 85 % and 6 countries below the average, and at last, Ireland, Luxembourg and Spain with values below 50 %.

The variation of taxable base, subjected to standard rate also represents the variation of importance of the standard rate. Thus, the differences in tax base would predict, that the higher VAT share on total taxation does not imply higher standard rates. That would not support the hypothesis H.

Table IV shows clear trend of closer coordination as far as standard VAT rates of the 1st group. The standard rates tend to rise, as the VAT share on total taxation increases. Average rate in 2010 grows to 21 % and since 2002 median values exceeds the arithmetic average – this would be explained of Cypriot rate 15 %, which is by 3 pp. lesser than the second lowest value.

Table V shows also the coordination of standard rates of VAT; the standard deviation decreases from 3.2 p.p. in 1995 to 2.3 p.p. in 2010. As the average rate slightly increases (from 21.1 % in 1995 to 21.8 in 2010) median value is the same – 22 %. In 2010 it represents the standard rate applied by Poland.

IV: *Standard VAT rates in EU Member states – the 1st group, 1995 to 2010*

1st gr.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BG	18	22	22	22	20	20	20	20	20	20	20	20	20	20	20	20
EE	18	18	18	18	18	18	18	18	18	18	18	18	18	18	20	20
IE	21	21	21	21	21	21	20	21	21	21	21	21	21	21	21,5	21
CY	8	8	8	8	8	10	10	13	15	15	15	15	15	15	15	15
LV	18	18	18	18	18	18	18	18	18	18	18	18	18	18	21	21
LT	18	18	18	18	18	18	18	18	18	18	18	18	18	18	19	21
PT	17	17	17	17	17	17	17	19	19	19	21	21	21	20	20	21
RO	18	18	18	22	22	19	19	19	19	19	19	19	19	19	19	24
SK	25	23	23	23	23	23	23	23	20	19	19	19	19	19	19	19
A	17.9	18.1	18.1	18.6	18.3	18.2	18.1	18.8	18.7	18.6	18.8	18.8	18.8	18.7	19.4	20.2
μ	18	18	18	18	18	18	18	19	19	19	19	19	19	19	20	21
σ	4.2	4.1	4.1	4.3	4.1	3.4	3.3	2.6	1.6	1.6	1.7	1.7	1.7	1.6	1.8	2.2

Source: Data from VAT Rates Applied in the Member States of the European Union, 2012, adjusted by authors

V: *Standard VAT rates in EU Member states – the 2nd group, 1995 to 2010*

2nd gr.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CZ	22	22	22	22	22	22	22	22	22	19	19	19	19	19	19	20
DK	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
GR	18	18	18	18	18	18	18	18	18	18	19	19	19	19	19	23
HU	25	25	25	25	25	25	25	25	25	25	25	20	20	20	25	25
MA	15	15	15	15	15	15	15	15	15	18	18	18	18	18	18	18
AU	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
PL	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
SI[6]					19	19	19	20	20	20	20	20	20	20	20	20
FI	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	23
A	21.1	21.1	21.1	21.1	20.9	20.9	20.9	21.0	21.0	21.0	21.1	20.6	20.6	20.6	21.1	21.8
μ	22	22	22	22	22	22	22	22	22	20	20	20	20	20	20	22
σ	3.2	3.2	3.2	3.2	3.1	3.1	3.1	3.0	3.0	2.5	2.4	2.0	2.0	2.0	2.4	2.3

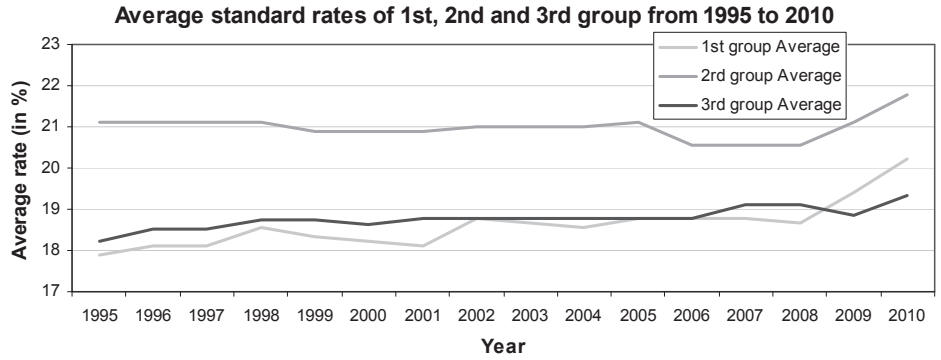
Source: Data from VAT Rates Applied in the Member States of the European Union, 2012, adjusted by authors

VI: *Standard VAT rates in EU Member states – the 3rd group, 1995 to 2010*

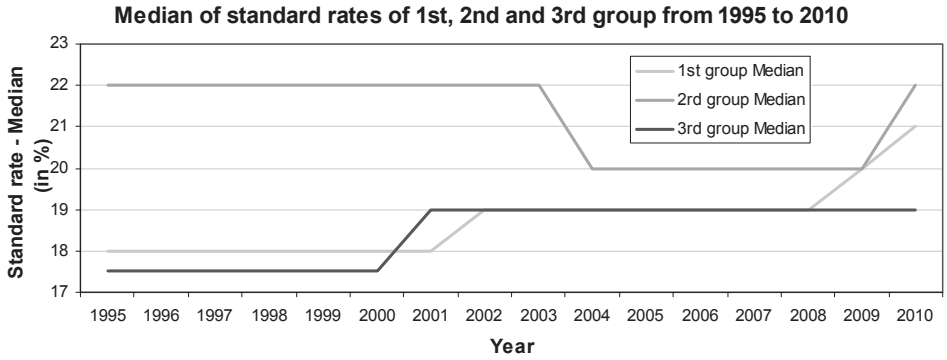
3rd gr.	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
BE	20.5	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21
DE	15	15	15	16	16	16	16	16	16	16	16	16	19	19	19	19
ES	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	18
FR	18.6	20.6	20.6	20.6	20.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
IT	19	19	19	20	20	20	20	20	20	20	20	20	20	20	20	20
LU	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
NL	17.5	17.5	17.5	17.5	17.5	17.5	19	19	19	19	19	19	19	19	19	19
SE	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
UK	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	17.5	15	17.5
A	18.2	18.5	18.5	18.7	18.7	18.6	18.8	18.8	18.8	18.8	18.8	18.8	19.1	19.1	18.8	19.3
μ	17.5	17.5	17.5	175	17.5	17.5	19	19	19	19	19	19	19	19	19	19
σ	3.0	3.1	3.1	3.0	3.0	3.0	2.9	2.9	2.9	2.9	2.9	2.9	2.8	2.8	3.0	2.6

Source: Data from VAT Rates Applied in the Member States of the European Union, 2012, adjusted by authors

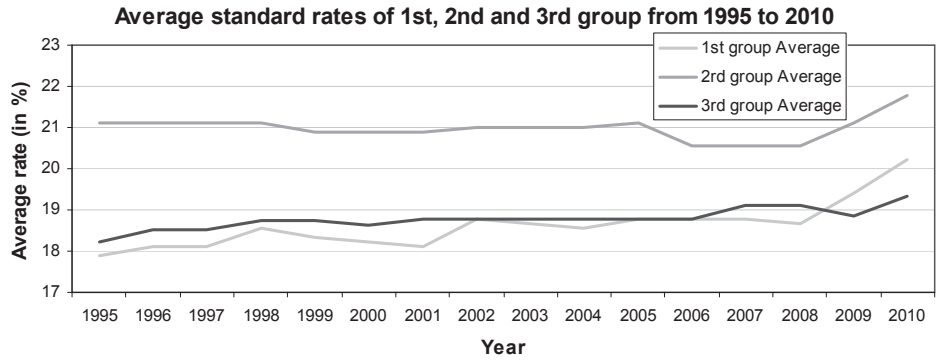
6 The data for Slovenia until 1999 aren't available



1: *The Averages of Standard rates from 1995 up to 2010*
Source: Date from European Commission: VAT Rates Applied in the Member States of the European Union, 2012, Own Calculation



2: *The Median of VAT Standard rates from 1995 up to 2010*
Source: Date from European Commission: VAT Rates Applied in the Member States of the European Union, 2012, Own Calculation



3: *The Standard deviation of VAT rates from 1995 up to 2010*
Source: Date from European Commission: VAT Rates Applied in the Member States of the European Union, 2012, Own Calculation

The coordination of standard rates of VAT is also valuable for 3rd group, although the differences in standard deviation in 1995 and 2010 aren't so important (0.4 pp). The average rate applied is the lowest between 3 groups, as it is the case of lowest VAT share on total taxation. In 2010, the variation of rates is the most important, compared to all other groups; with Luxembourg (15 %) and Sweden (25 %), rates vary by 10 pp.

The results in Tabs. IV, V and VI are clearly presented in graphs 1, 2 and 3, where the average, median and standard deviation are examined. The average and the median are presented so as to compare the results with VAT share and since the results obtained from the average would not necessarily be the same as the results obtained from median values, both values are presented. The standard deviation is presented since there is a slow coordination in rates of VAT. Although the prevailing trend is clear, the 3 followed groups differ none the less.

In all 3 cases, average standard rate tends to grow. The slowest trend (3.3 %) is represented by the 2nd group, partially because of higher initial value. The 1st group, with the lowest initial value grows by 12.8 %.

The average rate calculated for all three groups showed two main observations; one that all the groups of countries covered tends to raise its tax rates (by 0.7–2.3 pp), the second that the differentiation of mean values tend to shrink to 78.1 % in 2010 of differentiations between the average values in 1995.

Growing tendencies are less visible, especially in case of 2nd group, where the median fell by 2 pp (2004–2009). Comparing 1995 with 2010, there is no differentiation. The results obtained from 1st and 3rd group are more similar the previous; 3rd group median raises by 8.6 % and 1st group median raises by 16.7 % from 1995 to 2010.

Graph 3 shows a slight decrease of standard deviation over the period. That is, actually in accordance with Green Paper on the future VAT "in recent years, a certain convergence of the standard rates of VAT has been ongoing" (COM (2010) 695).[7]

If the results show the direct proportional relation of VAT share on total taxes and the amount of rate of VAT, the hypothesis H is rejected.

Average and median of standard rates (see graph 1 and 2), showed that the 2nd group, with the medium VAT share on total taxes, and sets its rates above the rates of the 1st group. In spite of the fact, that the 1st group has, on average, the highest share of VAT on total taxes (see tables I, II and III). The main results obtained (giving the relevance of the hypothesis) are thus the same, regardless if the median or arithmetic average, are studied. As confirmed by results obtained from average rates and the medium rates, it cannot be claimed that the higher the share of VAT on total taxes is, the higher the amount of standard rate of VAT becomes. The direct proportion is definitely not the case. The hypothesis is thus rejected, since the "clear implication" of rates of VAT on VAT share on total taxes is not approved.

DISCUSSION

While deciding the rates of VAT, each Member state has discretion in following different goals: budgetary – including the increase of tax income, the stimulation of the aggregate demand of the level of consumption, increasing or decreasing the relative accent on indirect taxation (in overall tax burden), etc.

Owens and Battiau (2011) showed that changing (increasing) of the rates of VAT so as to increase the tax collection in a period of economic crisis could modify the tax mix. These results are in accordance with data presented in Tabs. I–VI,[8] ex. PT 2002, GR 2005, MA 2004, NL 2001.

Comparing results obtained from graph 2 and 3 with Matthews (2003), presumption about existence of VAT Laffer curve could not be rejected. The group with the highest VAT share on total taxation (1st group) is one that, measuring by the median, has the more similar rates (until 2003) with "Matthews's optimum." Noteworthy that the 3rd and lowest share group achieves similar rates meanwhile the average VAT share on total taxation in 1st group reached up to 25 % and the 3rd group 17 %. In the case of 1st group, the results obtained by Matthews corresponds from the results presented here, but how to explain similar evidence of others groups? Concerning VAT share and the standard rate of VAT, there is no clear implication, since there are several other factors that may, in more precise way, impact the tax revenues, than the standard rates of VAT actually does. Rates of VAT and VAT share grows ensemble, but it does not mean, that one is the origin of other's growth.

The evidence of growing proportion of VAT on the tax mix is consistent with conclusion of Keen and Lockwood (2006) where VAT turned out to be a "money-machine" in "strong" sense - the revenues that VAT raises has to some degree been offset reduced revenues from other taxes. Thus, considering the tax mix, VAT share on total taxation increases, which is evidence that supports (but not directly prove) the "strong form".

As presented before, the standard rate of VAT is applied only to a certain proportion of VAT base.[9] That would be one of the explanations, why the VAT on total taxation has not clear implication on the standard rate of VAT, as assumed by the hypothesis H, which is rejected.

This paper focuses on the connection between the VAT collected and the rates applied to a relatively largest proportion of VAT base. But the VAT collected is represented "only" by a relative share on total taxation. The VAT share on GDP is not examined and thus, the tax quota, which differs

7 The higher share of VAT on total taxes, the higher differentiation in VAT rates at the beginning. (1st group 3.0 pp, 2nd group 3.2 pp and the 3rd group 4.2 pp, see tables IV, V and VI) At the same time, the higher differentiation at the beginning, the deepest fall in standard deviation afterwards and the closer coordination in 2010. Comparing the values of standard deviation in 1995 and 2010, the 3rd group falls by 13.3 %, 2nd group falls by 28.1 % and the 1st group falls by 47.6 %.

8 Portugal increased rate of VAT from 17 % up to 19 % in 2002; VAT share on the tax mix raised from 25.2 % to 26.0 %. Greece raised its rate of VAT by 1pp in 2005, VAT share on the tax mix raised also by 1pp. Malta raises its rate of VAT from 15 % to 18 % in 2004 and the VAT share raised from 22.5 % up to 24.5 %. Netherlands raised its VAT rate by 1.5 pp in 2001 and its VAT share raised by 1.0 pp. Time leg was taken into account.

9 The Standard rate of VAT covers only, on average, 69 % of the VAT base. (Mathis, 2004) The importance of this rate would be one of the key factors defining VAT revenues. It may imply that other factors, such as importance of reduced rates, super-reduced rates and zero rates of VAT, ineffectiveness in VAT collection such as tax evasions, stay important.

greatly within EU 27 (from 27.1 % in Lithuania up to 47.6 % in Denmark, 2010) could lead to misrepresenting.

Thus, the examination of VAT rates in function of the share of VAT on GDP is the topic of next research, (even though it is possible, that the results obtained would bring the same conclusion) such as comparing these results with Matthews and Laffer curve.

CONCLUSION

This paper showed that countries with the highest share of VAT on the tax mix do not necessarily sets its standard rates beyond the average and thus, the standard rate of VAT is not the key factor to define tax collection. There are several reasons; the standard VAT rate is not usually applicable to all VAT base and also, VAT is also subject to tax evasions or avoidances.

First, the EU Members were divided into groups in function of their VAT share on total tax. Second, VAT share was studied from 1995 to 2010 and the average, median and the standard deviation were calculated. VAT rates were than presented and both results were compared so as to answer the main question and indirectly, support the hypothesis H. The several limitations were discussed in precedent part and than, concluded.

The share of VAT on total taxes was already important in 90's. (almost 19.3 %, on average). Anyhow, this tax gains its importance (22.0 % in 2012). The identification of key factor which enables collecting more resources is not simple for reasons mentioned above. The complexity and thus, the effectiveness of VAT system remains one of the key problems in a field of indirect taxation.

Increasing standard rate of VAT could be succeeded by lowering the erosion of base of standard rate. As a result, the system of VAT could become more complex and would not automatically bring further revenues. In addition, the complexness of VAT could be one of motivation to tax avoidances of evasions.

Rising the rates of VAT affect the consumer prices. First, the prices elevated, if the price elasticity is important, could lead to drop in tax revenues. Second, if the rate of VAT is falling to original level would the prices follow this trend?

This paper focuses on connection of VAT share on total taxes and the standard rates of VAT. It demonstrated that one does not automatically lead to another. But the side effect on consumer prices and price distortions which was not studied is also very important and the deeper analysis on this ground should precede the changes of rates of VAT.

At last but not least, while answering the key question about the VAT share on total taxes in connection with standard rates of VAT, the proportion of VAT collection to all tax mix is affected by the level of tax quota which varies greatly. This could be also one of the reasons why the VAT share on the GDP could be studied although this could lead to similar conclusion.

The question remains whether VAT share on GDP would lead to identify more precisely the VAT rates, i.e. the countries with higher VAT ratio would be the same as the countries with the highest rates. Thus, this would be the subject of next research.

SUMMARY

The Value Added Tax (VAT) is one of the most successful and prodigious phenomena in the contemporary fiscal structures. Developed as late as in 1950's, it has rapidly become the most widespread consumption tax in the world. Despite the strong harmonization of taxes within the European Union, the rates of VAT are far from unification.

The paper was focusing on standard rates of VAT and the VAT share in the tax mix. Standard rates of VAT may and may not be the simple key to define whether VAT is important in the tax mix or not. The aim of the paper is to answer the key question whether the amount of the rate of VAT has an impact on the share of VAT in the tax mix.

Hypothesis H is following: The amount of standard rate of the VAT has clear implication on the share of VAT in the tax mix. Hypothesis is rejected when the rate of VAT and the share of VAT on total taxation are not directly proportional. Hypothesis is confirmed when the rate of VAT and the share of VAT on total taxation are directly proportional.

The method used in this paper is the method of induction. The dependence of the amount of rate of VAT on the share on VAT in the tax mix would be studied from the other side. All members of EU were classified onto three groups by nine members, according the average share of VAT on total taxes (in %), during the period from 1995 to 2010. Thus, the 1st group represents the countries with relatively highest share of VAT in the tax mix, the 2nd group consists the countries with medium share of VAT in their tax mix and finally, the 3rd group represents the countries with relatively low share of VAT in the tax mix.

The average, median and standard deviation of standard rates of VAT were calculated. The rates of VAT were compared within groups to answer the key question, if the members of EU with relatively highest share of VAT on total taxation set its standard rate above the average. VAT share on total taxes was obtained from European Commission (2012) and the information about standard rates for all

cover period and all member countries was obtained from European Commission /Taxation and Customs Union/VAT/VAT Rates (2012).

As confirmed by results obtained from average rates and the medium rates, it cannot be claimed that the higher the share of VAT on total taxes is, the higher the amount of standard rate of VAT becomes. The direct proportion is definitely not the case. The hypothesis is thus rejected.

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