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ZMENY VO VÝVOJI SADZIEB DPH A ICH VPLYV NA EKONOMICKÚ ÚROVEŇ EURÓPSKYCH KRAJÍN

Changes in the evolution of the VAT rates and its impact on the economic level of European countries

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Annotation
Nowadays, value added tax (VAT) is the decisive revenue for national budgets in many countries. Before fifty years, at the first time VAT was introduced in France. Now, it is accepted in over 130 countries worldwide. The aim of the paper is to evaluate the impact of the change in the VAT rate on the economy of the EU Member countries. The methodology of the nonparametric tests allowed to analyse 46 cases of changes in the VAT rate in relation to selected macroeconomic factors. The subject of the analyse was the EU Member states between 1994 and 2016. The development of the monitored macroeconomic indicators was only 50-60% in line with the scientific findings and there is no possibility clearly to cluster the particular EU countries according to regional aspects based on data provided. We stated it on the basis of the ambiguity of the results of the impact of the VAT rate change on the economy using nonparametric tests. The VAT rate change has the most significant impact on export, which declined sharply after rising rates. In the next period, an export increased in 60.62% of cases. Another significant impact was the decrease in consumption after the increase in the rate and the existence of substitution and arbitrary effect in average 53.84% of cases.

Key words
value added tax, turnover tax, gross domestic product, consumption, nonparametric test

Anotace
Daň z pridanej hodnoty je v súčasnosti rozhodujúcim príjmom štátnych rozpočtov mnohých krajín. Od jej prvého zavedenia vo Francúzsku ubehlo skoro 50 rokov a odvtedy bola prijatá vo viac ako 130 krajinách sveta. Cieľom príspevok je zhodnotiť dopad zmeny sadzby dane z pridanej hodnoty na ekonomiku členských krajinách EÚ. Metodika neparametrických testov umožnila spracovať analýzu 46 prípadov zmien sadzby DPH vo vzťahu k vybraným makroekonomickým faktorom. Predmetom skúmania boli členské krajiny EÚ v období rokov 1994 až 2016. Nejednoznačnosť výsledkov ohľadom vplyvu zmeny sadzby DPH na ekonomiku pomocou neparametrických testov ukázalo, že vývoj sledovaných makroekonomických ukazovateľov bol v súlade s doteraz zistenými vedeckými poznatkami len na 50 až 60 % a nie je možné na základe týchto ukazovateľov jednoznačne regionalizovať krajiny v rámci európskych krajín. Ukazovatele potvrdili, že najvýraznejší dopad vyvolala zmena sadzby pri export, ktorý poklesol tesne po náraste sadzby, ale v ďalšom období vzrástol v 60,62% prípadov. Ďalším dôležitým dopadom by bol pokles spotreby po zvýšení sadzby a existencia substitučného a arbitrážneho efektu v priemere na 53,84%.

Klíčové slova
daň z pridanej hodnoty, daň z obratu, hrubý domáci produkt, spotreba, neparametrické testy

JEL classification: *H21, H25*

1. Introduction

Over the past half century, the value-added tax, or VAT, has become a major source of government funding for a significant number of countries around the world. Despite its importance and promised benefits, the VAT is relatively understudied in empirical economics (Ufier, 2017).

Common value added tax (VAT) plays an important role in the European single market. What is decisive for this single market is the level of the rate that regionalizes its values within the EU with its values. The basic regional distribution of the EU countries is classification of old Member States, which rate ranges from 17% to 25%, and new Member States, ranging from 18% to 27%. The first VAT directive dates back to 1967. Its original purpose was to abolish turnover taxes that distorted competition and hampered the free movement of goods. Another reason was the removal of fiscal controls and formalities at the internal borders. VAT is an important and growing source of revenues in the EU - in 2016, it was more than 1 trillion €, that is an equivalent to 7% of the EU's GDP. VAT is the one of the EU's own sources of revenue that makes basis. VAT is a consumption tax. VAT is one of the forms of taxation that most support economic growth. Despite many reforms the VAT system is no longer able to keep up with the challenges of the current global, digital and mobile economy. The system is too complicated with an increasing number of cross-border businesses and leaves a lot of field for fraud (access to domestic and cross-border transactions is different, the goods or services can be purchased without VAT in the single market). The European Commission is constantly working to promote the reform of the VAT system. The current rules are one of the last areas where the European Union law is not in line with the principles, on which the single market is based. Currently, Council Directive 2006/112 / EC about the common system of the value added tax is in force since 1 January 2007. This directive has replaced the Sixth Council Directive and contains current legislation on the common VAT system.

The aim of this paper is to monitor the impact of the change in the VAT rate on the economy of Member States of the EU. The nonparametric test model was used for the analysis. The model evaluated the change in the value added tax rate and its impact on the economy through selected macroeconomic indicators (gross domestic product, consumption, exports and unemployment). The methodology of nonparametric tests allowed to analyse 46 cases of changes in the VAT rate in relation to selected macroeconomic factors. The subject of research was 28 EU countries for the period from the first quarter of 1994 to the fourth quarter of 2016. The selection of the variables was conditioned by the theoretical findings of the authors as Baker and Brechling (1992), Besley a Rosen (1998), Delipalla and O´Donnell (1999); Carbonnier (2005, 2006), Raisová (2012) and Hakalova (2014). The authors looked at the impact of VAT and other macroeconomic factors on household and final consumer consumption in the EU countries and the relationship between sales tax and the consumer price index with an emphasis on transferring changed rates into prices. The result of the research is that tax rates are greater in sectors and countries with perfect competition.

The input variables are:

- ***Gross domestic product*** - at current prices in mil. €,
- ***Consumption*** – growth rate of the consumption in %,
- ***Export of goods and services –*** at current prices in mil. €
- ***Unemployment rate -*** in %.

2. Literature Review

Countries seeking to reduce variation in tax revenues as well as raise revenue to solve deficits often consider a VAT, and the IMF in particular has become an advocate for the tax for countries seeking tax reform (Ufier, 2017). Value added tax is the most used tax. Through VAT countries can greatly increase the tax revenues. This is a tax of consumption. Taxpayers take this tax as a part of the price of the goods and services. According to Paulíčková (2002), VAT is a general consumer tax which is a burden for the final consumer but the tax is paid by the supplier. One group of economists Barrell et. al (2009); Samimi et.al (2012); Papcunová et. al (2012) maintains that the countries with established VAT have an advantage in international competition over the countries that relies on taxation of income. The second group of economists Hines et al. (2005); Jenkins et al. (2000) state that VAT is too idealized and there is not affect competition. This does not depend on how competitive is defined. Idealized VAT is uniform for all goods and services. However, there are a different VAT rates on consumer goods and services, in practice (Slemrod, 2011). Many of analysis of the impact of the change in the VAT rate on the national income, employment and other macroeconomic indicators were realized through the general equilibrium models. Boetersa et al. (2006); Byea et al. (2012) said that VAT changes affect demand and the different VAT rates increase demand in sectors with a lower VAT rate. If we consider that the state budget needs to be balanced, the positive effects from the preferred sectors will be outweighed by negative effects in the rest of the economy. Böhringer et al. (2005) has shown that reducing social transfers by reducing VAT will lead to an increase in

employment. Sørensen (1997) concluded that increasing VAT and lowering the basic border tax rate at the same time, would lead to a reduction in official employment and an increase in illegal employment. The overall effect on society's welfare is negative. The changes in the VAT rate affect the supply of labour through the changes in the real wages. An increase in VAT will cause a reduction in labour supply because of the consumption is more expensive in comparison with spending leisure time. In the case of an increase in the VAT on work-related expenditure (e.g. travel or clothing), additional barriers to work could arise, especially in the case of the secondary incomes (Metcalf, 1995). Distribution effects arise if changes in the VAT increase demand for low-skilled labour. Low-skilled labour is at the lower end of the income distribution, therefore improving the conditions in a labour market segment has positive distributional effects (Economics, 2008). Frederiksen et al. (1995) propose to spend resources to an active labour market policy focusing on structural unemployment. Generally, the impact of changes in the VAT rates on the employment is influenced by many interrelated factors. The specific circumstances of each state determine the final outcome of these factors. Countries where the main income is VAT revenue, have a lower export-to-GDP ratio. Keen et al. (2006) explain the mechanism of the impact of the change in the rate on net exports from the point of view of the actual return on savings. The expected increase in the VAT rates reduces the actual return on savings. Consumers will shift the consumption forward to avoid a higher tax in the next period. That means, the net export will fall at first, but will increase in the next period. Due to the inability of the tax systems, the commercial neutrality cannot be achieved (Hines et al., 2005). The obstacle is the existence of multiple rates and a large number of exceptions that lead to relatively higher effective tax rates of tradable goods than non-tradable goods. Countries with a high share of tax revenue on total revenues have a lower trade to GDP ratio than countries with a different government revenue structure. Barrell and Weale (2009) state that there are three expected effects of the temporary reduction of the VAT rate. The first is related to the tax cut (retirement effect). The remaining two (substitution and arbitrary effects) are related to the expected increase rate in the future. The retirement effect can be eliminated by the expectation of a possible increase in other taxes, such as compensation for a revenue shortfall in the state budget. In the case of arbitrary effects, consumers purchase but do not consume non-perishable goods before the reported VAT increase. By substitution effect, the cost of consumption after the expected increase in the rate will be relatively higher than before the increase, which will lead consumers to substitute consumption after the increase over that before the VAT increase. Individuals who optimize their consumption utility will change the timing of consumption due to a change in the expected real interest rate as it affects the current cost of consumption in the future in relation to the present. The expected increase in the VAT will reduce the expectations of the real interest rate in the time immediately before the VAT increase itself. Harris (1987) states that the substitution effect is measured by intertemporal substitution elasticity (EIS), which is based on microeconomic data derived from short-term consumption products. This includes products subject to a lower VAT rate. Mostly, products necessary for life cannot be substituted for later consumption, while the consumption of luxury products can be postponed later. According to Miki (2011), the effect of the retirement effect on aggregate consumption is clearly negative in the case of an increase in VAT, because the rate increase will reduce the available income for people. Aggregate consumption will change even though the government will lower the income tax rate as compensation for the decline in consumer incomes due to the increase in the VAT rates. Ramona et al. (2011) have a similar view. Increasing the VAT rate will have a negative impact on the purchasing power of the population and on the economy as a whole, through a reduction in population consumption. The other effects of the change in VAT depend on the timing of the announcement and on the expectations of the sustainability of change. The effects of tax changes may take place before its formal introduction. Stiglitz (2000) states that predicting future increases in the VAT rates may increase the demand for certain goods. It is also possible that consumers will postpone the consumption of goods because a tax reduction has been reported. The spread of both effects is different in each sector of the economy, as it is dependent on pension, price and cross-demand elasticity (Economics, 2008). The impact of the change in the VAT rate on the country's GDP depends on the overall fiscal policy setting. If the VAT is reduced, the loss of VAT tax revenue is offset by an increase in other taxes or it is not covered by any other income. The country's debt will be deeper. After time, the VAT must be increased to its original size to trigger the original balance of public spending.

3. Results and discussion

Nonparametric tests, which were used to analyse a real impact of VAT rate change on the economy in the EU countries, enabled us to eliminate effects of short-term influences on the selected indicators. We tested changes in VAT rate before and after announcing change in a rate by government, as well as during a period when VAT rate has been changed.

In the very first step of our analysis, we calculated four basic indicators of the growth rate (G) for each variable:

- **G1** –growth rate of variables in the quarter before VAT rate has changed to the previous quarter,
- **G2** – growth rate of variables in the quarter when VAT rate was changed to the previous quarter,

- **G3** – average growth rate of variables during the period of VAT rate change (e.g. one quarter before VAT rate change and one quarter after VAT rate change) to the previous quarter,
- **G4** – average economic growth rate of variables in four quarters, e.g. in the three quarters before VAT rate change including a quarter when VAT has been changed.

In our analysis, we focused on signs, which represent differences in growth rates G1, G2, G3 and G4. With these differences, we have created tree new indicators X1, X2 and X3. As Table 1 states, in a case of increase in VAT rate, we anticipated the following sings:

Tab. 1: The anticipated results of nonparametric tests

	Consumption	Gross domestic product	Export	Unemployment
X1 = G1 – G4	+	+		
X2 = G2 – G4	-	-	+	+
X3 = G3 – G4	+	+	+	+

Source: own processing

Provided that the VAT rate has been changed, consumers accelerate a purchase of long-life goods before a change in VAT rate what occurs a decrease in consumption in the next period. If we analyse deeply an effect of VAT change within a half year, an intertemporal substitution will speed up consumption in two quarters of the half year. If a change in VAT rate has been reduced, we anticipate the opposite signs. Our next hypothesis is about an impact of the economic growth. We expect that the final effect on gross domestic product (GDP) will be the same as the effect on consumption because consumption is one of a component of GDP. By variables export and unemployment do not exist expectations for change in VAT rate. However, we anticipate that effects will be more permanent. That means that a positive effect does not result into a negative effect, and conversely. An increase in VAT rate should augment export, as well as unemployment.

3.1 Nonparametric tests of the selected economic indicators

As was stated above, the aim of the nonparametric tests was to find out changes in the economic growth rates (a change in GDP), consumption, export and unemployment in the certain period, which was a subject of our test model.

Consumption

Firstly, in the nonparametric tests of consumption we expected the following changes in indicators X1, X2 and X3:

- an increase in VAT rate: +, -, +
- a reduction in VAT rate: -, +, -

The results can be divided into three groups: a total change in VAT rate, an increase in VAT rate and a reduction in VAT rate. The majority of values (25 of 46 of all values) were signed correctly by indicator X3. This indicator informs us about a weakening effect of a VAT rate change on consumption. The empirical results proved that consumption will come back to its normal values before VAT rate change. Other two indicators X1 and X2 were signed correctly in 53.33% of all cases (Tab. 2). A precise occurrence of expected signs at the same time happened in Q1-20017 in Germany (from 16% to 19%), Q1-2012 in Ireland (from 21% to 23%), Q3-2015 in Portugal (from 19% to 21%), Q1-2011 in Slovakia (from 19% to 20%), Q3-2016 in Spain (from 16% to 18%) and Q3-1999 in Slovenia (the first establishing of VAT at level of 19%). The biggest drop in consumption was recorded in Ireland in the beginning of 2012, where consumption fell by 2.35% over that period. In Germany in Q1-2007, consumption dropped by 1.35%. Despite of an increase in VAT rate, in some European countries like Greece (Q2-2005), Ireland (Q2-2002) or Slovenia (Q1-2002) were recorded an increase in consumption in the previous quarter about 5.06%, 2.66% or 3.61% respectively. Indicators X1 and X3 have reached higher accuracy when VAT rate was reduced in the EU countries. A reduction in VAT rate copied an expected development in Czech Republic in Q3-2004 (from 22% to 19%), in France Q1-2000 (from 20.60% to 19.60%), in Slovakia Q1-2003 and Q1-2004 (from 23% to 20%, and to 19% respectively). The indicator X2 (expected growth rate after VAT rate reduction) was positive only in 40% of all cases, and the biggest increase in X2 was recorded in Slovakia (6.33% in Q1-2004). To immediate increase of consumption growth did not happen in Ireland in Q1-2014, Portugal in Q3-2008 and the United Kingdom in Q4-2015. Most probably, a reduction of consumption occurs in the next following quarter after VAT rate reduction.

Tab. 2: Nonparametric test of consumption

An increase in VAT rate			A reduction in VAT rate		
18	35	51.43%	6	10	60.00%
20	35	57.14%	4	10	40.00%
18	34	52.94%	7	10	70.00%

Source: own processing

We can say that on average indicators X1, X2 and X3 have confirmed validity of conclusions of sooner stated author Miki (2011) about a reduction of consumption after VAT rate increase. Also, our test confirmed a conclusion of Barrell and Weale (2009) about existence of substitution effect and arbitrary effect on average 54.49%.

Gross domestic product (GDP)

Our expectations about an impact of VAT rate change on GDP (on the economic growth) were the same as was stated above in a variable consumption, that means:

- an increase in VAT rate: +, -, +
- a reduction in VAT rate: -, +, -

Overall, a nonparametric test of GDP shows very similar results: 25 of 46 values of X1 variable (55.56%), 22 of 46 values of X2 variable (48.89%) and 23 of 46 values of X3 (52.27%) were signed correctly. If we divide these results based on increase and reduction of VAT rate, then they are very similar to an increase of VAT rate. A reduction of VAT rate copied an expected development in about 60-70% (see Tab. 3), and the highest probability was proved to be true for decline of GDP, shortly after VAT reduction.

Tab. 3: Nonparametric test of GDP

An increase in VAT rate			A reduction in VAT rate		
18	35	51.43%	7	10	70.00%
16	35	45.71%	6	10	60.00%
17	34	50.00%	6	10	60.00%

Source: own processing

To those EU countries that reached such as values of X1, X2 and X3 as we expected belong Czech Republic in Q1-2010 (a change in VAT rate from 19% to 20%), Finland in Q3-2010 (from 22% to 23%), France in Q1-2000 (from 20.60% to 19.60%), Hungary in Q1-2012 (from 25% to 27%), Portugal in Q3-2005 (from 19% to 21%), Slovakia in Q1-1996 (from 25% to 23%), Slovenia in Q3-1999 (from 0% to 19%) and Spain in Q4-012 (from 18% to 21%). The highest decline of GDP growth rate expressed in percentage terms, was recorded in Ireland in Q2-2002 (drop by 3.46%), in Q4-2008 (2.88%) and Q1-2012 (5.51%). On the other hand, the highest increase of GDP growth rate was reached also in Ireland in Q1-2010, specifically by 2.59%. Despite our expectations of VAT rate, it is interested that in fact a change of consumption and GDP growth rate happened only in three cases, meaning in France in Q1-2000, in Portugal in Q3-2005 and in Slovenia in Q3-1999. In the most of EU countries (Greece in Q2- 2010; Netherland in Q1-2001, Q4-2012; Poland in Q1-2011; Portugal in Q3-2015; Slovenia in Q1-2012; United Kingdom in Q1-2011) the results were exactly the opposite. In Greece was an increase of GDP by 5.73%, in Netherland by 2.27% and 0.71%, in Poland by 2.53%, in Slovenia by 4.36%, and in United Kingdom by 2.56% after increase of VAT rate. However, in Portugal after a reduction of VAT rate happened a decline of GDP by 0.27%. According these calculations, we cannot exactly say whether a risen VAT rate will firstly cause a decline in GDP before a change, and the next following quarters after this change will cause an increase, as stated Ramona et al. (2011). Our analysed data demonstrate this hypothesis on average 52.24%. More recently however, more and more governments have turned their attention to using VAT as an instrument for financing of the total government expenditures. Germany rose VAT rate in the beginning of 2007, partly because of fiscal shortening in social security contributions. Also United Kingdom increased VAT rate because of the fiscal consolidation. There is a presumption that governments in the advanced economies prefer economic growth and competitiveness before income distribution. However, the effect is unclear.

Unemployment

For this variable, we anticipated only an influence for indicators X2 and X3:

- an increase in VAT rate: +, +
- a decline in VAT rate: -, -

The indicator X1 expresses only the most frequent values in a certain sample; specifically, 22 of 38 values of unemployment rate were higher than an average for the four previous quarters that including a change in VAT rate. The results of X1 were distorted the most due to the missing data. From the available data we obtained 50-

62.5% of correct signs in unemployment variable after reduction in VAT rate. In these cases, when VAT rate has been raised, 43-57% of values confirmed our expectations for increased unemployment as a reaction of increased VAT rate (Table 4).

Tab. 4: Nonparametric test of unemployment

An increase in VAT rate			A reduction in VAT rate		
17	30	56.67%	5	8	62.50%
13	30	43.33%	4	8	50.00%
13	29	44.83%	5	8	62.50%

Source: own processing

The development of unemployment between EU countries complied with our assumptions in 6 countries (Greece in Q2-2005 and Q2-2010; Hungary in Q1-2006; Ireland in Q4-2008; Italy in Q4-2011; Portugal in Q3-2012; and Slovakia in Q1-2015). More than 2% decline in unemployment rate was recorded after 3% decline in VAT rate in Q3-2004 in Czech Republic (from 22% to 19%), as well as in Slovakia in Q1-2003 (from 23% to 20%). The highest increase of unemployment growth rate on quarterly basis was recorded in those countries, which have increased their VAT rate in the post-crisis period:

- Ireland – Q4-2008, 0.5% increase in VAT rate, an increase of unemployment by 15.98%;
- Estonia – Q3-2009, 2% increase in VAT rate, an increase of unemployment by 15.15%;
- Hungary – Q3-2009, 1% increase in VAT rate, an increase of unemployment by 8.27%;
- Greece – Q2-2015, 2% increase in VAT rate, an increase of unemployment by 8.31%;
- Portugal – Q1-2011, 2% increase in VAT rate, an increase of unemployment by 7.19%;
- Italy – Q4-2013, 2% increase in VAT rate, an increase of unemployment by 8.70%.

United Kingdom reduced its VAT rate by 2.5% in Q4-2008, nevertheless unemployment rose by 7.79%. In contrary, in some EU countries unemployment fell, such as in:

- Germany – Q1-2007, 3% increase in VAT rate, a decline of unemployment by 9.09%;
- Netherland – Q4-2012, 2% increase in VAT rate, a decline of unemployment by 13.51%;
- Slovenia – Q3-2013, 2% increase in VAT rate, a decline of unemployment by 8.75%.

Neither in this case we cannot exactly confirm the hypothesis stated in Economics (2008) about positive influence of reduced VAT rate on unemployment because the data met by this opinion only in 46.69%.

Export

The last analysed variable was export, for which we expected the similar signs as was stated above:

- an increase in VAT rate: +, +
- a reduction in VAT rate: -, -

Based on X1 indicator, the EU countries reached an increase of export also before in a period when VAT rate was increased, specifically in 21 of 35 cases, or 60% in percentage terms (Tab. 5). Export was the only one variable, which a percentage of conformity of expected values in comparison to real values exceeded 57%. As results showed, 70% of cases when VAT rate was decreased, value of export reduced, even in quarter immediately after a change. In contrary, 22 of 46 values indicated an increase of export in the next quarter after an increase in VAT rate.

Tab.5: Nonparametric test of export

An increase in VAT rate			A reduction in VAT rate		
21	35	60.00%	7	10	70.00%
20	35	57.14%	6	10	60.00%
22	34	64.71%	7	10	70.00%

Source: own processing

To clear occurrence of expected signs of all indicators at the same time happened in Belgium in Q1-1996 (from 20.5% to 21%); in Estonia in Q3-2009 (from 18% to 20%); in Greece in Q2-2005 (from 18% to 19%), Q2-2010 (from 19% to 21%) and Q3-2010 (from 21% to 23%); then in Hungary in Q3-2009 (from 20% to 25%); in Portugal in Q3-2008 (from 21% to 20%) and in Q3-2010 (from 20% to 21%); in Slovenia in Q3-1999 when VAT rate was adopted for the first time in this country; in United Kingdom in Q4-2008 (from 17.5% to 15%) and in Q1-2010 (from 15% to 17.5%).

The highest percentage increase of export on quarter basis was recorded in Greece, specifically 30.33% in Q2-2015, 35.41% in Q2-2010 and 21.86% in Q3-2013. Despite of an increase of VAT rate, in Hungary export fell by 3.50% in Q1-2012, and in Ireland by 4.29% in Q2-2002.

In United Kingdom, there were recorded an increase of export by 5% in Q4-2008, instead of a reduction in VAT rate by 2.5%. More frequently, there were cases in the EU that export rose after an increase in VAT rate in certain country:

- France – Q1-2000, 1% decline in VAT rate, an increase of export by 3.67%;
- Ireland – Q1-2001, 1% decline in VAT rate, an increase of export by 3.17%;
- Hungary – Q1-2006, 5% decline in VAT rate, an increase of export by 8.79%;
- Ireland – Q1-2010, 0.5% decline in VAT rate, an increase of export by 4.89%.

However, these results are in contrary to the principles of the international trade theory, according to which a change in VAT rate does not have an effect on export. Differences in empirical results can be caused by the existence of the monetary union and the fact that the majority of international trade in EU prevails in Euro zone where there is no necessary to adapt to the exchange rates. However, according to Keen and Syed (2006) there exists a possibility that export will decrease immediately after VAT rate growth, but in the next quarter it will rise. The evidence of this conclusion confirmed data on average 61.84%.

Conclusion

We cannot consider value added tax to a stable instrument of the economic policy, instead of its long-term existence. The main reason is that this tax reacts to various changes, specifically in the economic, financial and political sector. Value added tax (VAT) represents the main financial source for financing public expenditures in each European country. The aim of our research was to investigate the growth rate of consumption, GDP, unemployment and export using statistical nonparametric tests. We set three indicators X1, X2 and X3 to find out an impact of a change in VAT rate on the growth rate in a period before and after VAT rate has been changed. These three indicators were calculated as a difference of growth rates in that year when a change in VAT rate happened. It was confirmed a decline in consumption after VAT rate increase, and an existence of the substitution effect and arbitrary effect on average 53.84%. When analysing GDP growth rate, 49.05% of changes indicated the expected values, what means that an increase in VAT rate caused firstly a reduction of GDP, and then in the following two quarters after a change an increase in GDP. An increase in VAT rate had a negative effect on unemployment on average 48.28%. Variable export fell shortly after VAT rate increased, but in the next quarter it rose again in 60.62% of all cases. As a result, the development of the monitored macroeconomic indicators was only 50-60% consistent with the scientific findings so far and it is not possible to regionalize the countries within the EU clearly on the basis of these indicators. Based on our empirical results we can sum up, that there are appropriate sceptical reasons that an increase in VAT rate will lead to an increase in revenues in the public budget, as we consider a long-term point of view. VAT is a very prone area that can lead to criminal frauds, so-called carousel financial fraud. These financial schemes are used a tax regime within EU for illegal activity. Still relevant and up-to-date questions in VAT field are questions about an effective VAT rate, or EU tax harmonisation process. In many EU Member states, there were adopted incoherent tax reforms that cause problems, as well. Therefore, a discussion about the future development of VAT in the EU is still relevant topic between politicians, professionals and tax consultants.

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