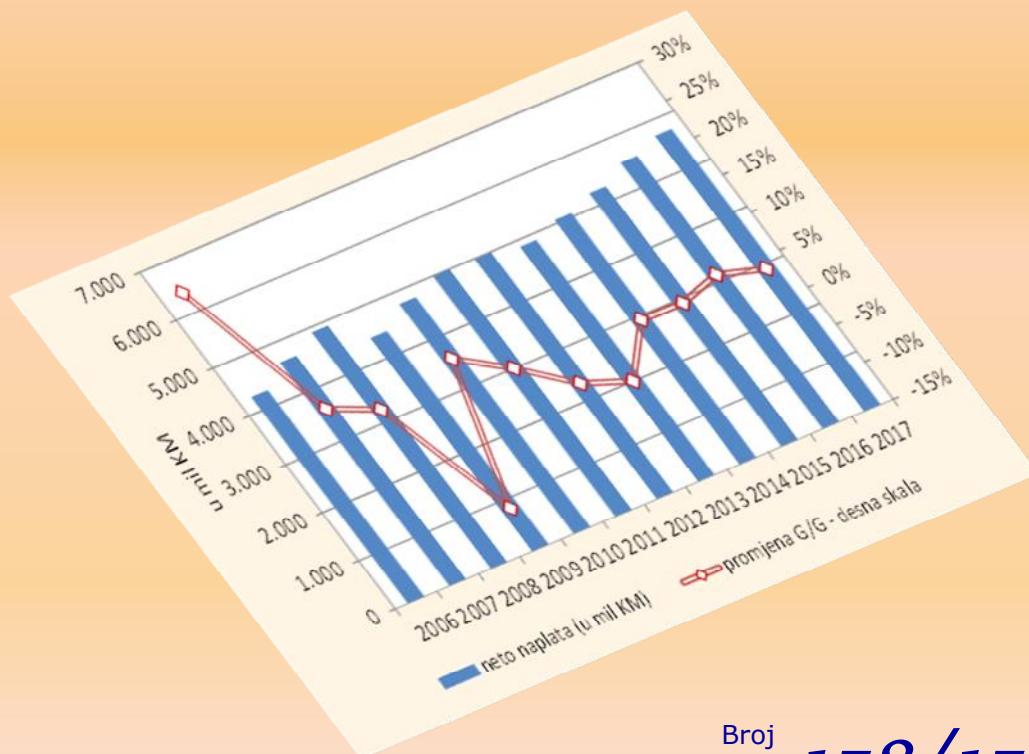




Macroeconomic Unit of the Governing Board of the Indirect Taxation Authority

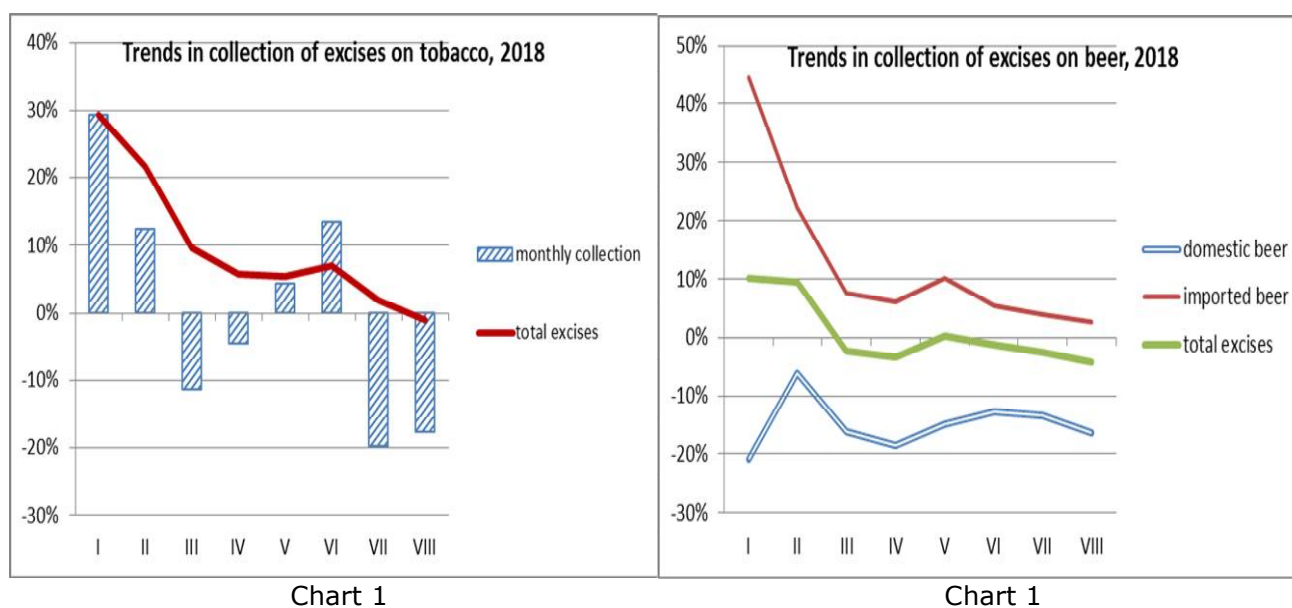
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With this issue

The gross revenues from indirect taxes were higher by 361,6 million KM in the period of first eight months of 2018. Given an increase in refunds of 83,2 million KM in the period January - August 2018, the net collection was higher by 278,4 million KM or by 7,4% compared to the same period of 2017. The surplus of revenues refers to the collection of VAT and road tax, and to a lesser extent to customs revenue. The poor collection of excise revenues in the last two months nullified the surplus from the first half of 2018. Recording a 4% growth, the collection of excises on imported tobacco products remained in a positive growth zone, but with apparent downward trend (Chart 1). The huge deficits in revenues from excise duties on domestic tobacco of 55,3% and 45,9% were recorded in the last two months, resulting in a cumulative deficit of 32,3%, with no serious recovery prospects by the end of the year.



Positive trends in revenue collection from excises on alcohol and alcoholic beverages were recorded in August, which mitigated the former negative trends. On the other hand, trends in revenues from excises on non-alcoholic beverages have deteriorated. Poor collection of excises on beer in August has deepened the existing weaknesses in collection. Revenues from excises on imported beer, however, remained in the positive growth zone, while the fall in revenues from excise duties on domestic beer amounts even 16,4% (Chart 2).

Dinka Antić, PhD
Head of Unit

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The effective tax burden on consumption

(Prepared by: Aleksandra Regoje)

This article is a continuation of the analysis of the tax burden on consumption published in October 2011 (Bulletin number 75) and April 2014 (Bulletin number 105).

It is shown the dynamics and structure of the effective tax burden on consumption in B&H, as well as the overview of the same in the EU Member States.

The implicit tax rate measures actual or effective tax burden, directly or indirectly imposed on different tax bases or potentially taxable activities. It is calculated by dividing certain type of revenue with the appropriate tax base. It can be determined for each type of tax category: consumption, labor and capital. The implicit tax rate enables a monitoring of tax burden levels over time (so-called tax shifts from one type of economic activity to another) as well as comparison of tax characteristics across countries. If the ITR level does not vary during the economic cycle, this would point to perfectly proportionate link between the revenue and tax base. In the reality ITR changes during the cycle, and, in generally indicates that changes in tax revenues exceed the change of their tax bases.

The comparability of implicit tax rates among EU Member States is enabled by the use of data presented in accordance with the European System of National and Regional Accounts (ESA). However, harmonization can only be fully achieved by using the same denominator for all countries without taking into account the specificities of tax legislation. The attractiveness of the approach lies in the fact that all elements of taxation are implicitly taken into account, such as the combined effects of statutory rates, tax deductions and tax credits. The level of the implicit tax rate is also influenced by the extent of exemptions, gray economy, taxation thresholds, etc. The advantage of capturing such a wide set of factors is also accompanied by difficulties in the interpretation of implicit rate dynamics in cases where it is not possible to separate the effects of different factors.

In this article we will focus on the ITR on Consumption (ITRC). First, we will look at developments in the European Union, and then concentrate on the ITRC dynamics in B&H. Given that methodology used to calculate the ITR on consumption has been explained several times in the previous editions of the bulletin, here we will briefly look at the method of calculating this indicator in Appendix 1: "ITRC calculation methodology" at the end of the article.

1. ITR on consumption in the EU

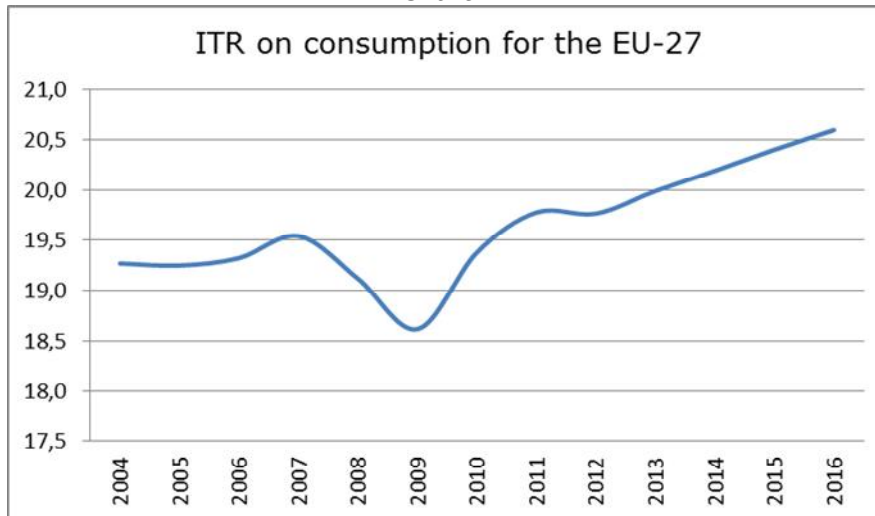
The implicit tax rate on consumption in 2016 amounted 20,6% for the EU-27. Despite the high degree of harmonization of indirect taxes in the European Union there are significant differences in the levels of effective burden on consumption in individual states. The ITR on consumption ranged between 15,8% (Spain) and 31,2% (Denmark) in 2016.¹

The weighted average of the ITRC for the EU-27 has been growing steadily since 2010.² Compared to 2009, the average for 2016 is higher by 2 percentage points. Greece and Hungary recorded the highest growth compared to 2009 (5,1 and 5 p.p. respectively), while the three Member States recorded even a lower drop in ITR on consumption (Cyprus, Denmark and Luxembourg).

¹ DG Taxation and Customs Union, Data on taxation (May 2018)

² EU-27 doesn't include Croatia

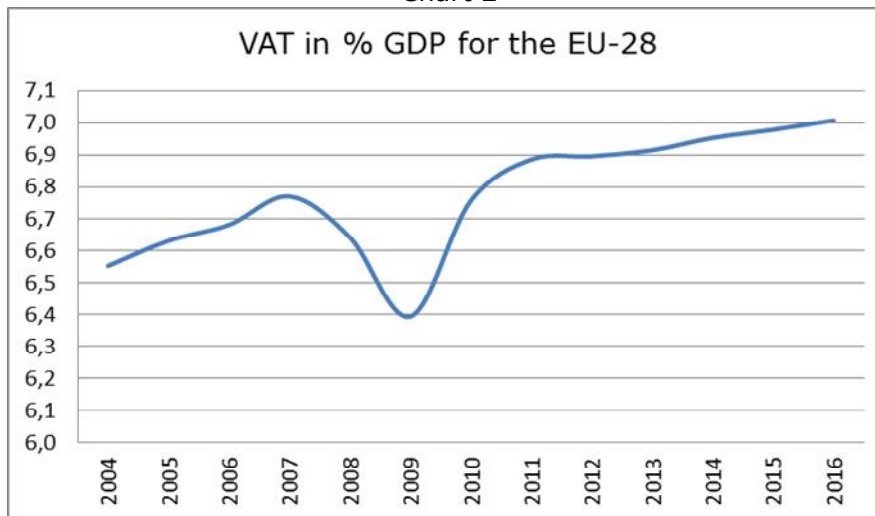
Chart 1



Source: DG Taxation and Customs Union, Data on taxation, May 2018³

The share of indirect taxes in GDP for the EU in 2016 has also increased significantly compared to 2009 (1 p.p.). Given that VAT has the highest share in consumption taxes⁴, the ITR movement is largely determined by the dynamics of VAT revenues and VAT rates. The share of VAT revenue in GDP has increased by 0,6 p.p. in the period 2009-2016.

Chart 2



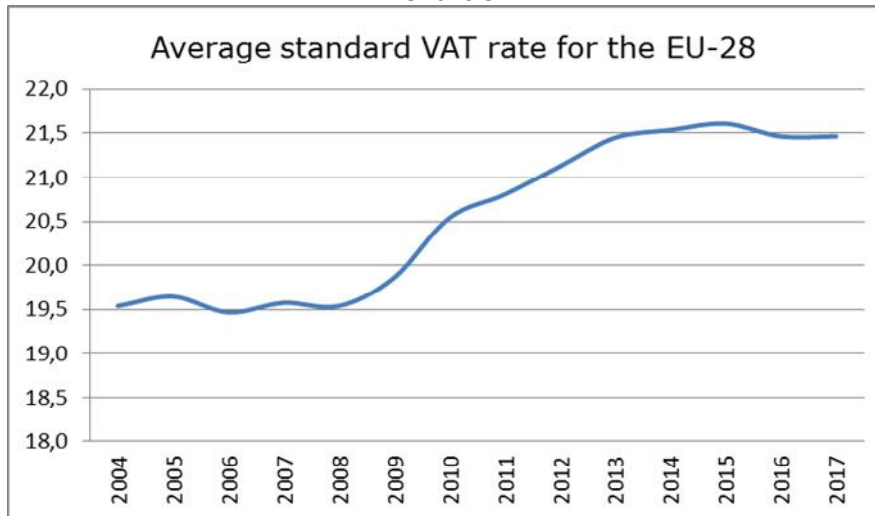
Source: DG Taxation and Customs Union, Data on taxation, May 2018

We see from the Chart 3 that the average VAT rate (unweighted average) has steadily increased since 2008. In 2017, the average has increased by 1,9 p.p. compared to 2008, and by 1,6 p.p. compared to 2009 (Chart 4).

³ https://ec.europa.eu/taxation_customs/business/economic-analysis-taxation/data-taxation_en

⁴ The share of VAT revenues in the overall ITR on consumption ranged between 54% in Greece and 75% in Sweden in 2015 (Taxation Trends in the European Union, 2017 edition, page 23).

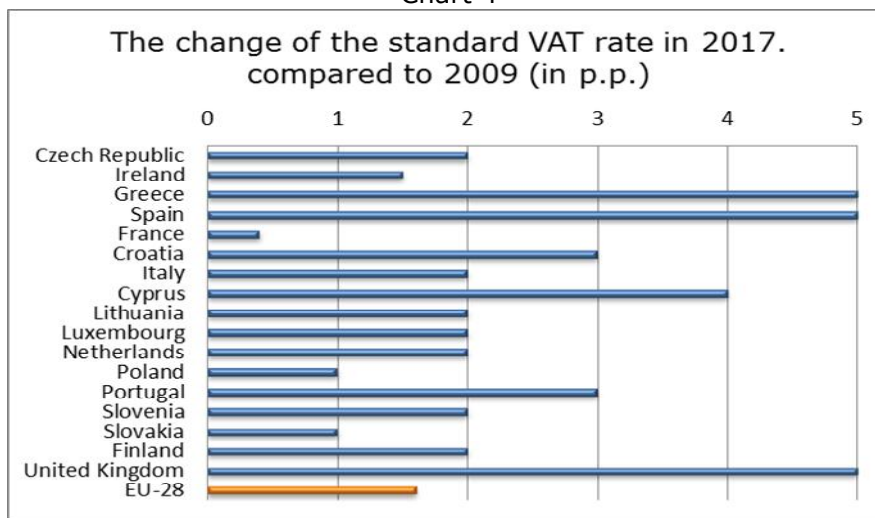
Chart 3



Source: Taxation and Customs Union, Statutory tax rates⁵

The exception is 2017, when only two Member States changed the rate. Greece increased its rate by 1 p.p. and Romania decreased by 1 p.p., so that the average for all EU Member States remained unchanged. This has stopped the long-term growth trend of the VAT rate.

Chart 4



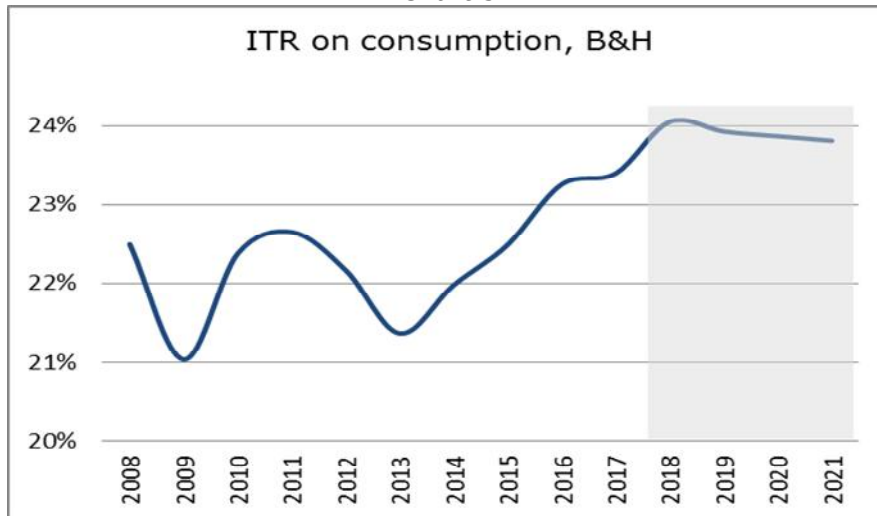
Source: Taxation and Customs Union, Statutory tax rates

2. ITR on consumption in B&H

It has been a turbulent period for the implicit tax rate on consumption in B&H over the past 10 years. The trends of falling and the growth of this indicator alternated (Chart 5).

⁵ European Commission, Directorate General Taxation and Customs Union, Data on taxation, https://ec.europa.eu/taxation_customs/business/economic-analysis-taxation/data-taxation_en

Chart 5



Source: Author's calculation based on ITA and BHAS⁶ data, and on projections of DEP⁷

Chart 6

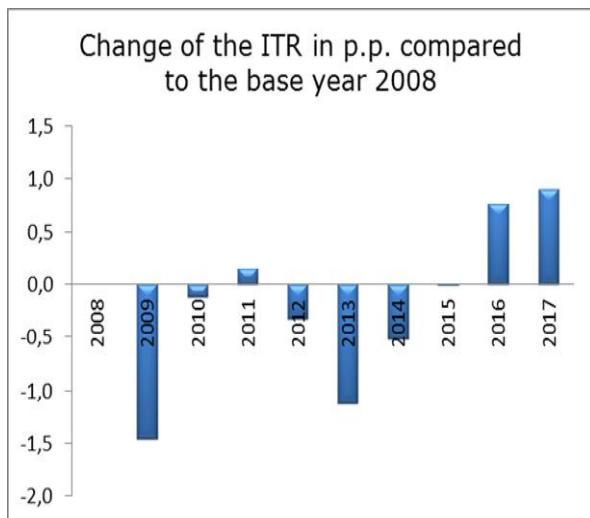
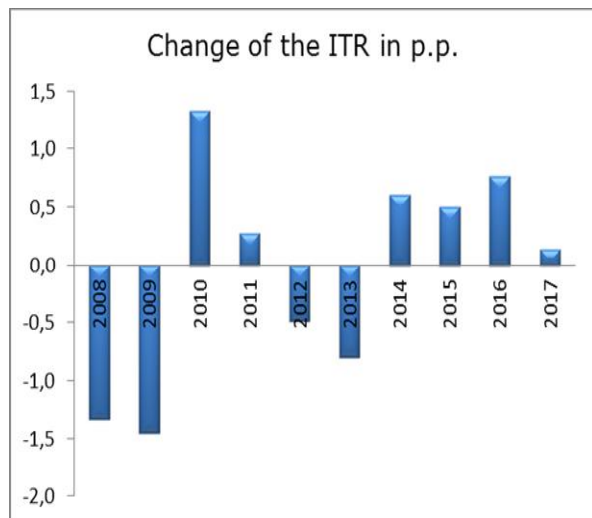


Chart 7



Source: Author's calculation based on ITA and BHAS data, and on projections of DEP

After the fall in 2008 and 2009, there were two years of growth (2010 and 2011) and then again two years of decrease (2013 and 2014) of the ITR on consumption. After that the growth trend of the ITR on consumption occurred again, which in 2017 (23,4%) almost reached the level of pre-crisis 2007 (23,7%, without lagging revenues collected on entity accounts). Further growth was projected for 2018, while the stabilization or a modest decrease of the ITR on consumption was projected for the period 2019-2021 (at a level of slightly below 24%).⁸

⁶ Agency for Statistics of B&H, 30 September 2017

⁷ Directorate for Economic Planning B&H, Mart 2018

⁸ Indicators for 2017 are also part of the projections given that at the time of the ITRC calculation data on private consumption were not available by BHAS but DEP projections were used.

2.1. The components of the ITR on consumption

In order to explain the causes of turbulences of the ITR on consumption, this indicator should be broken down into its components:

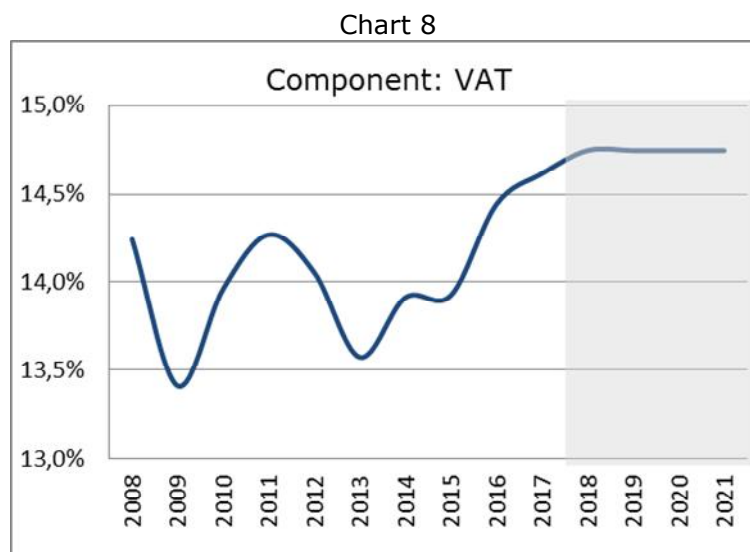
1. VAT,
2. energy,
3. tobacco and alcohol,
4. other.

Based on this approach, one can see how much a certain component of consumption tax has a share in the ITR.

2.1.1. VAT component of the ITR on consumption

This component is calculated by dividing VAT revenue by the expenditure on private consumption. The level of the VAT component of the ITR on consumption ranged from 13,4% (2009) to 14,6% (2017). Given that projections for the next three-year period (2019-2021) follow the projected growth of private consumption (DEP), the stabilization of this indicator is expected.

The VAT component is the most significant component of ITR for consumption in B&H, and its movement largely determines dynamics of the overall indicator of the ITR on consumption. The share of the VAT component in the ITR for consumption over the past 10 years ranged from 62 to 64%.

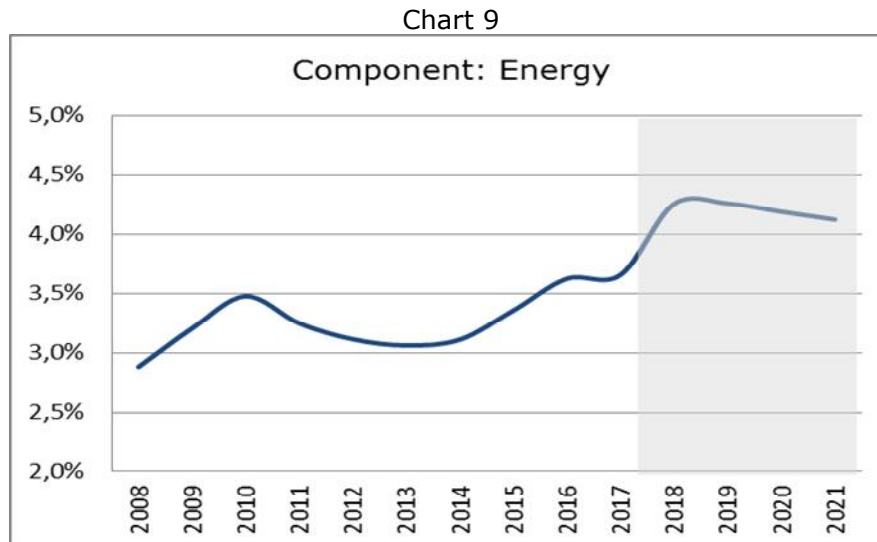


Source: Author's calculation based on ITA and BHAS data, and on projections of DEP

In order to explain the significance of dynamics of these revenues to the movement of ITRC, the Appendix 2 of this article shows a hypothetical example of how much the VAT growth rate in 2018 influenced the ITRC, in comparison to the same growth rate of revenues that belong to another component. It is assumed in the example that the projected growth of private consumption in 2018 is 3,33% as in DEP projections. It can be calculated from the formulas available in Appendix 2 of this article, that, for example, VAT growth rate of 10,4% in 2018 would lead to an increase in the VAT component of ITRC (and total ITRC) by 1 p.p. (or 0.01), while the same growth rate (10,4%) of revenues that belong to the categories "Energy", "Tobacco and Alcohol" and "Other" would increase the ITRC by only 0,25 p.p., 0,25 p.p. and 0,1 p.p., respectively.

2.1.2. Energy component of the ITR on consumption

The calculation of this indicator for B&H includes revenues from excises on oil and oil derivatives, as well as road tax revenues.



Source: Author's calculation based on ITA and BHAS data, and on projections of DEP

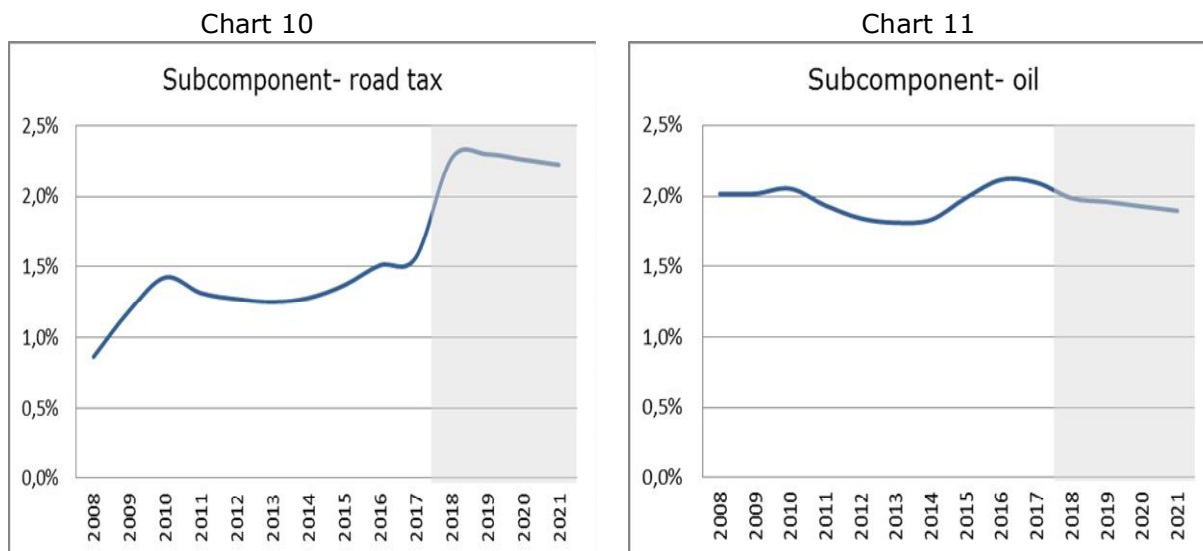
The energy component of the ITR on consumption ranged from 2,9% to 3,7% in the period 2008-2017. In the crisis year 2009, when the private consumption declined by 3,7%, and in 2010, when its modest growth of 1,8% was achieved (BHAS, September 2017), the energy component of the ITR on consumption grew by even 0,32 and 0,27 p.p. respectively. The reason for this is the new Law on Excises,⁹ which entered into force on 1 July 2009 and, among other influences, brought significant effects on the revenue from road tax due to the introduction of an additional road tax for the financing of motorways (0,10 KM per liter of oil derivative). In the period 2011-2012 there was a fall in revenues which belonged to this category, while in 2013 they were kept close to the level of the previous year. The drop in revenues in 2011-2012 was largely attributed to the changes in the structure of fuel consumption in favor of diesel and as well as to an increased consumption of heating oil.¹⁰ On the other hand, private consumption grew in the period 2011-2013, and in this period was again recorded the trend of decrease of energy component of the ITR on consumption. Since 2014, revenues from this category have been growing above the growth rate of consumption, and therefore growth trend of energy component of the ITR on consumption has reappeared.

The projection of road tax revenue for 2018 includes the effects of the rate increase in accordance with the changes in the Law on Excise Taxes as of 1 February 2018, and is higher by even 50% from the road tax collection in 2017. A strong growth of energy component of ITRC is therefore planned of as much as 0,6 p.p., in spite of the projected negative growth rate of excise taxes on oil. The projected road tax revenues do not increase significantly in the period 2019-2021 due to the depletion of the effects of the growth in tax rate. A slightly higher growth is planned only in 2019, as the higher rate of the earmarked road tax has not been in use since the very beginning

⁹ Official Gazette of B&H No. 49/09

¹⁰ Differentiated taxation of derivatives, which implies refund payments of excises on heating oil in certain circumstances and exemptions from paying road tax for mines, power plants and railways, have led to a reduction in the collection of revenues from excise duties on derivatives, as well as in revenue from road tax.

of 2018.¹¹ Energy component of ITRC is planned to stagnate in 2019, while the anew decrease is planned for the period 2020-2021 since the projected growth rates of excises tax on oil and road tax do not follow the growth rate of private consumption.¹²



Source: Author's calculation based on ITA and BHAS data, and on projections of DEP

2.1.3. Tobacco and alcohol component of the ITR on consumption

Revenues from excises on tobacco have been under great influence of legislative changes over the past period. Since the middle of 2009, the new Law on Excise Tax has been in force, which has brought the rate changes. The new ad valorem rate is reduced from 49 to 42%, but the same is calculated on the tax base including VAT, and approximately corresponds to the previously applied rate. The category of minimum excise tax on cigarettes was introduced (application since 1 January 2010), related to the most popular price category of cigarettes. In order to harmonize with the EU standards, a specific excise in the amount of 0,15 KM per cigarette pack was introduced, which has been increasing each year since 2009 for the same amount, amounting therefore 1,50 KM per cigarette pack in 2018.

In the initial years of the observed period, the growth in fiscal burden on cigarettes led to a strong increase in revenues from excises on tobacco, in spite of the expected drop in cigarette consumption. The strong growth rates of revenues from excises on tobacco in 2009, 2010 and 2011¹³, with a decline in private consumption¹⁴ in 2009 and its modest growth in 2010 and 2011, have led to a huge rise in the both the tobacco and alcohol components of the ITR on consumption. The component of tobacco and alcohol in 2011 was higher by as much as 1,537 p.p. compared to 2008 (Chart 12), thanks to the growth of the subcomponent of tobacco for 1,583 p.p. (Chart 13), while the subcomponent of alcohol in this period recorded a decrease of 0,046 p.p. (Chart 14).¹⁵ In 2012, there was a significantly lower growth in revenues from excises on tobacco (5,9%) than in the previous three years, but still higher than the growth of private consumption.

¹¹ Revenue growth in year (y), due to the lower base for comparison in year (y-1) where partly lower rates of taxation were applied, as well as in the case of comparison 2010/2009.

¹² Revenue projections for 2018-2021 available in OMA Bulletin No. 154-155

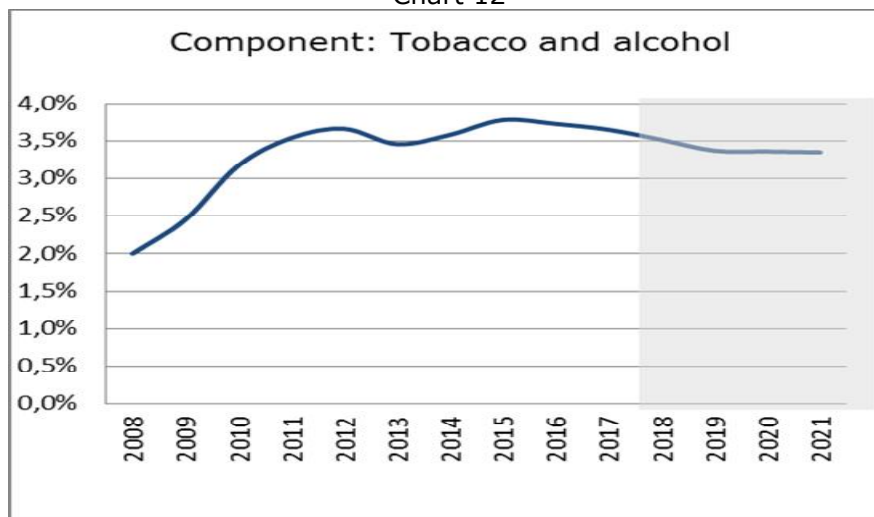
¹³ 23,3%, 37,1% and 16,3% respectively

¹⁴ It is about total private consumption (in our calculations: final consumption expenditures of households and NPISH from BHAS report), not the consumption of tobacco products.

¹⁵ Tobacco / alcohol subcomponent is calculated by dividing tobacco / alcohol excise revenue by the expenditure on total private consumption.

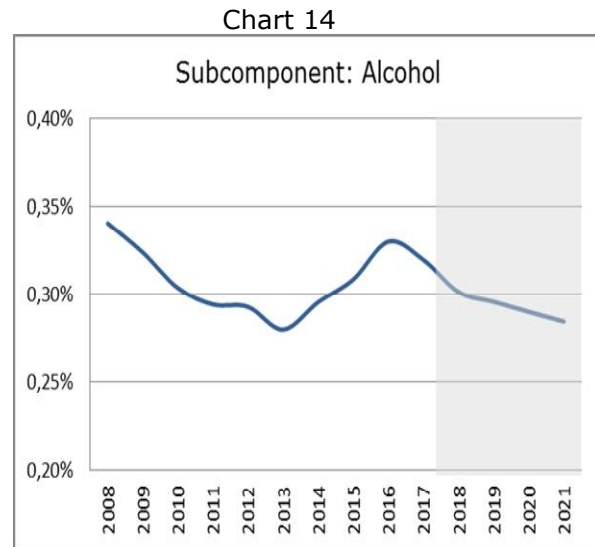
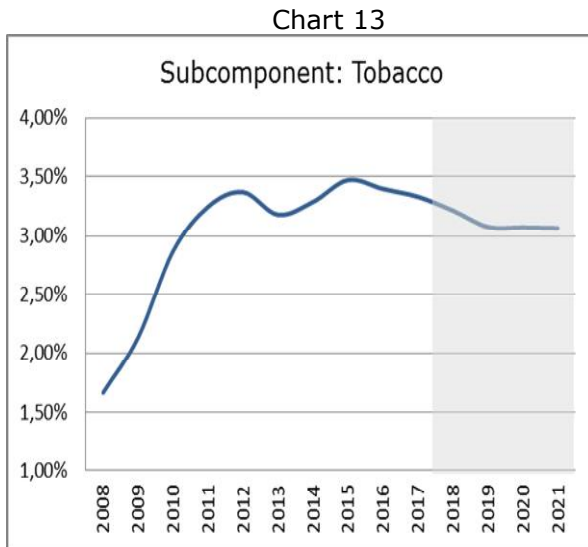
The growth of the tobacco subcomponent of the ITR on consumption has been stopped in 2013 when the fall in revenues from excises on tobacco amounted 4,1%. One of the main reasons for the fall in revenues from excises on tobacco was the substitution of consumption of cigarettes by cut tobacco, due to the growing gap between fiscal burden of cigarettes and cut tobacco, whose rates of taxation haven't been increased since 2009. The drop in revenues from excises on tobacco despite the rise in the rate of cigarette tax in 2013 has been an alarm for amending legislation in this area, in order to stop distortions in the tobacco market. The new policy of excise on tobacco from 2014¹⁶ has brought a huge increase in the fiscal burden of cut tobacco. This has led to a temporary stabilization in the tobacco market and to increase in revenues from excises on tobacco in 2014 and 2015. The growth rates in these years have exceeded private consumption growth rates, so the increase of the subcomponent of the ITR on consumption has been recorded (Chart 13). Substitution of cigarettes by cut tobacco arose again already in 2016, because of the rise in the price of cigarettes, so the stagnation of excise revenues on tobacco was recorded in 2016 and 2017 (-0,5% in 2016 and + 0,9% in 2017) as well as the reappearance of decrease in the tobacco subcomponent of the ITR on consumption. According to the projections of the Unit, the further stagnation of revenues from excises on tobacco is expected in 2018. Given the projected growth rate of private consumption (DEP), the tobacco subcomponent of the ITR on consumption has been projected to fall (Chart 13).

Chart 12



Source: Author's calculation based on ITA and BHAS data, and on projections of DEP

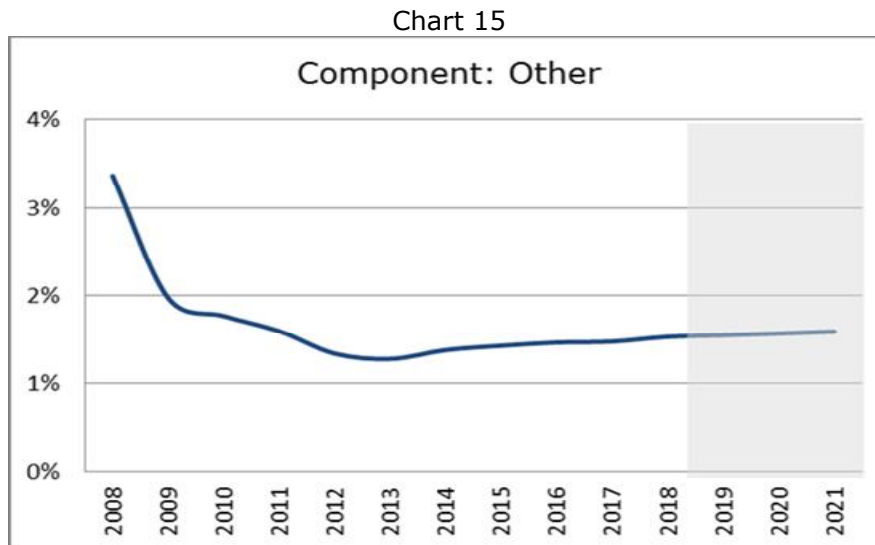
¹⁶ Official Gazette of B&H No. 49/14



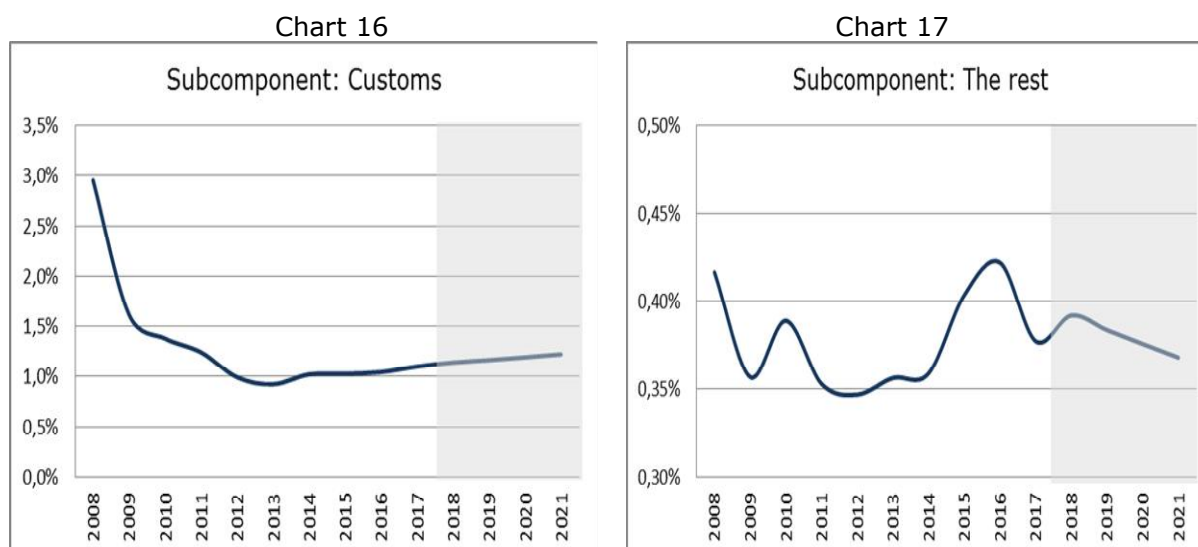
Source: Author's calculation based on ITA and BHAS data, and on projections of DEP

2.1.4. Component „Other“

The component "Other" includes all other revenues from the ITA Single Account that are not included in the previous three components.



Source: Author's calculation based on ITA and BHAS data, and on projections of DEP



Source: Author's calculation based on ITA and BHAS data, and on projections of DEP

Given that customs revenue has the largest share in the revenues that are included in the calculation of the component "Other" of the ITR on consumption (74,5% in 2017), its dynamics has largely determined the movement of the mentioned component. The implementation of the provisions of the Stabilization and Association Agreement with the EU began in mid-2008, implying the gradual liberalization of imports originating in the EU. In the following year (2009) the revenues from customs duties almost halved, and the negative trend of these revenues had continued until 2013, when the final phase of the transitory period of tariff cuts was completed. A strong revenue growth of 11,5% was achieved in 2014, mainly due to the large growth of imports from China.¹⁷ Given the low share of customs in total indirect taxes, this has contributed to the increase of the ITR on consumption by only 0,1 pp. Lower rates of customs growth were achieved in 2015 and 2016 (1,9% and 3,5%), while in 2017 a growth rate of 8,4% was reached. Nevertheless, due to the low share of customs in indirect taxes (4,7% in revenues from SA 2017, net amounts) and positive trends in private consumption, the increase in the customs subcomponent of the ITRC in 2017 compared to 2014 amounted only 0,08 p.p.¹⁸ The subcomponent that includes other revenues belonging to the component "Other" of the ITR on consumption is shown in Chart 17. It includes excises on coffee and non-alcoholic beverages, as well as miscellaneous and unadjusted revenues collected on the ITA Single Account. We see that this subcomponent is not significant, and amounts around 0,35% -0,40%.

¹⁷ Imports from China in 2014 increased by 48,7% (Agency for Statistics of B&H, First release no. 12, 20 January 2015).

¹⁸ More about the contribution of individual components to the increase of the ITRC can be found in the Appendix 2

Appendix 1: The ITRC calculation methodology

According to EU methodology the ITR on consumption is defined as all consumption taxes divided by the final consumption expenditure of households of the economic territory (domestic concept).

Box 1.1. Definition of the ITR on consumption

Implicit tax rate on consumption (ESA 2010)	Taxes on consumption/ P.31_S.14dom
---	---------------------------------------

Numerator: Taxes on consumption (Box 1.2.)

Denominator: Final consumption expenditure of households on the economic territory (domestic concept) (P.31_S.14dom)

Source: DG Taxation and Customs Union, European Commission, "Taxation Trends in the European Union" 2017 Edition, p. 255

Taxes on consumption are defined as taxes levied on transactions between final consumers and producers and on the final consumption goods. In the ESA classification these can be identified as the categories shown in Box 1.2.

Box 1.2. Taxes on consumption according to ESA classification

D.211	Value added type taxes
D.212	Taxes and duties on imports excluding VAT
D.214	Taxes on products except VAT and import duties
less D.214b	Stamp taxes
D.214c	Taxes on financial and capital transactions
D.214k	Export duties and monetary compensatory amounts on exports
From D.29	Other taxes on production
D.29d	Taxes on international transactions
D.29f	Taxes on pollution
D.29g	Under-compensation of VAT (flat rate system)
From D.59	Other current taxes
D.59b	Poll taxes
D.59c	Expenditure taxes
D.59d	Payments by households for licenses

Source: DG Taxation and Customs Union, European Commission, "Taxation Trends in the European Union" 2017 Edition, str. 247

We see that consumption taxes include majority of indirect taxes (D2), but not all categories. They also include some of the categories from the line D59, which belong to direct taxes given that they relate to expenditure of households to obtain certain goods or services.

The denominator of ITR on consumption in Equation 1 includes the final consumption expenditure of households on the economic territory (*P31_S14dom*), which does not correspond to the legal tax base.

ITR consumption can be observed as an overall measure of burden of consumption or it can also be divided into four basic categories: (1) VAT, (2) energy, (3) tobacco and alcohol, and (4) the "Other". In the latter case only the numerator is broken, while the denominator remains the same (private consumption). Therefore, care should be taken when interpreting the certain component of the implicit tax rate, since, except in the case of VAT component, the actual tax base is only a small part of the denominator.

It should be noted that the coverage of consumption taxes is different in B&H from the one in the European Union, which should be taken into account when comparing data. In the tax system of B&H, consumption taxes are comprised of all indirect taxes, i.e. VAT, excises, customs and road taxes. In calculation of ITRC for B&H private consumption comprises of final consumption expenditures of households and NPISH.

Appendix 2. Contribution of a particular component to the increase of the ITR on consumption

In the foregoing, we have seen that even the huge growth rate of certain revenue (e.g. customs revenue) did not significantly contribute to the increase in the ITR on consumption, if it was the revenue with small share in taxes on consumption. Therefore, we will here explain the relationship between the growth rates of individual revenue and the change of the ITR on consumption, and their dependence on other parameters.

From the relationship between the ITR on consumption, revenues and private consumption (Box 1.1 in the Appendix 1. "The ITRC Calculation Methodology"), the following equations can be derived. If in the year (y) consumption taxes grew at the rate p , and the private consumption at the rate r , the ITRC change in year (y) in comparison to the year ($y-1$) would amount as in Equation (1) in Box 2.1, while the change of a certain component of the implicit tax rate on consumption (ITRC_c) depends on its share (S_c) in ITRC (or ITRC_c) and would amount as in Equation (2).

Box 2.1.

(1)

$$ITRC_{(Y)} - ITRC_{(Y-1)} = ITRC_{(Y-1)} * ((1+p):(1+r)-1)$$

(2)

$$ITRC_{C(Y)} - ITRC_{C(Y-1)} = ITRC_{C(Y-1)} * ((1+p_c):(1+r)-1) = s_{C(Y-1)} * ITRC_{(Y-1)} * ((1+p_c):(1+r)-1)$$

ITRC_(Y) - Implicit tax rate on consumption in year (Y)

ITRC_(Y-1) - Implicit tax rate on consumption in year (Y-1)

ITRC_{C(Y)} - certain component (c) of the implicit tax rate on consumption in year (Y)

ITRC_{C(Y-1)} - certain component (c) of the implicit tax rate on consumption in year (Y-1)

S_{C(Y-1)} - share of certain component of the implicit tax rate on consumption in year (Y-1), i.e. the share of revenue of a certain component in the overall taxes on consumption

p - growth rate of total consumption taxes

p_c - growth rate of the taxes on consumption belonging to a certain component

r - growth rate of private consumption

Source: Illustration of the author

Box 2.2.

(3)

$$p_c = (\Delta ITRC_C : ITRC_{C(Y-1)} + 1) * (r+1) - 1$$

Source: Illustration of the author

We can observe the same issue from the opposite angle. From the equation (2) it can be derived the Equation (3) by which can be calculated the appropriate growth rate of a certain revenue category (p_c) for a specific change in the component of the ITR on consumption ($\Delta ITRC_C = ITRC_{C(Y)} - ITRC_{C(Y-1)}$).

Simulation of the change of a certain component of the ITR on consumption ($\Delta ITRC_C$) for a specific change in revenue from that component

If the growth rate of total revenue / revenue from a particular ITRC category would correspond to the rate of private consumption growth, there would be no change in the ITRC / $ITRC_C$. Any other revenue growth rate p (assumption: same for all categories) would not lead to equal changes in the components $ITRC_C$.¹⁹ We have seen from the Equation (2) that the change in the $ITRC_C$ ($\Delta ITRC_C$) depends not only from the rates of growth of revenues and consumption, but from the $ITRC_C$ level in the previous year as well.

In order to illustrate the impact of the revenue growth rate on the ITRC in the specific case of revenue structure and consumption level in B&H, it is presented below the simulation of the changes of the ITR on consumption of the certain component ($\Delta ITRC_C$) for a specific change in the revenue from that component. The real levels of components of ITRC from 2017 were used in the simulation ($ITRC_{C(2017)}$). The assumption is that the private consumption in 2018 will grow at the rate $r=3,3271\%$ according to the projections of the Directorate for Economic Planning of B&H.

There are calculated the revenue growth rates of individual components (p) for the specific changes in components $ITRC_C$ according to the Equation (3) from Box 2.2. There are also shown the changes of $ITRC_C$ for the specific revenue growth rates, calculated by Equation (2) from the Box 2.1.

Example No 1

If we assume that the private consumption growth in 2018 will correspond to the DEP projections (3,3327%), then from the Equation (3) can be calculated that for the increase of each component by 1 p.p. ($\Delta ITRC_C=0,01$) would be required the following revenue growth rates: 10,4% of VAT, 31,56% of "Energy" component revenue, 31,63% of "Tobacco and alcohol" revenue and the revenue from the component "Other" for as much as 73,28% (see tables 1-4, last column). Then the total ITRC growth would be 4 p.p.

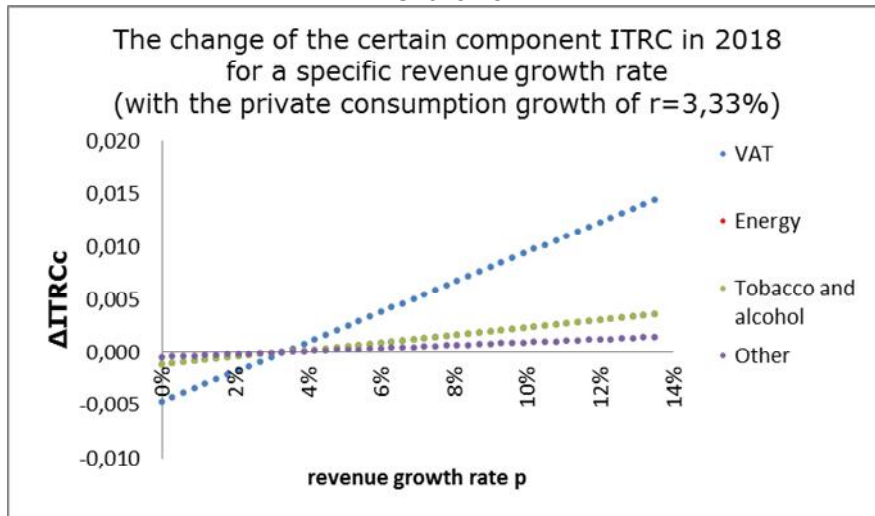
Example No 2

It can be calculated from the Equation (2) that the growth rate of VAT revenues of 10,4% in 2018 would bring an increase in the VAT component of ITRC of 1 p.p. or 0,01, while the same growth rate (10,4%) of revenues belonging to the categories "Energy", "Tobacco and alcohol" and "Other" would result in ITRC increase of only 0,25 p.p., 0,25 p.p. and 0,1 p.p., respectively.

Simulation with the same assumptions (realized $ITRC_{C(2017)}$, projections of consumption for 2017 and 2018 by DEP) is presented in Chart 18 and Tables 1-4.

¹⁹ Except in the rare case of equal $ITRC_C$ in year $(y-1)$

Chart 18



Source: Simulation of the author based on ITRC_c for 2017

We see from Chart 18 that any revenue growth rate below the growth rate of consumption would lead to a drop in the corresponding component of the ITR on consumption. The "Energy" component almost coincides with the component "Tobacco and Alcohol" because of the approximately same levels of ITRC_c in 2017, and the use of same assumptions for revenue growth (p) and private consumption growth (r) in 2018.

Tables 1-4: Simulation of the change of a certain component of the ITR on consumption ($\Delta ITRC_c$) for a specific change in revenue from that component

Table 1: VAT component, $ITRC_{C(2017)} = 14,62\%$, assumption $r=3,3271\%$										
$\Delta ITRC_c$ (in p.p.)	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1
p	4,03%	4,74%	5,45%	6,15%	6,86%	7,57%	8,28%	8,98%	9,69%	10,40%
$ITRC_{C(2018)}$	14,72%	14,82%	14,92%	15,02%	15,12%	15,22%	15,32%	15,42%	15,52%	15,62%

Source: Simulation of the author based on $ITRC_c$ for 2017

Table 2: Component: Energy, $ITRC_{C(2017)} = 3,66\%$, assumption $r=3,3271\%$										
$\Delta ITRC_c$ (in p.p.)	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1
P	6,15%	8,97%	11,80%	14,62%	17,44%	20,27%	23,09%	25,92%	28,74%	31,56%
$ITRC_{C(2018)}$	3,76%	3,86%	3,96%	4,06%	4,16%	4,26%	4,36%	4,46%	4,56%	4,66%

Source: Simulation of the author based on $ITRC_c$ for 2017

Table 3: Component: Tobacco and alcohol, $ITRC_{C(2017)} = 3,65\%$, assumption $r=3,3271\%$										
$\Delta ITRC_c$ (in p.p.)	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1
P	6,16%	8,99%	11,82%	14,65%	17,48%	20,31%	23,14%	25,97%	28,80%	31,63%
$ITRC_{C(2018)}$	3,75%	3,85%	3,95%	4,05%	4,15%	4,25%	4,35%	4,45%	4,55%	4,65%

Source: Simulation of the author based on $ITRC_c$ for 2017

Table 4: Component: Other, $ITRC_{C(2017)} = 1,48\%$, assumption $r=3,3271\%$										
$\Delta ITRC_c$ (in p.p.)	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1
P	10,32%	17,32%	24,31%	31,31%	38,30%	45,30%	52,29%	59,29%	66,28%	73,28%
$ITRC_{C(2018)}$	1,58%	1,68%	1,78%	1,88%	1,98%	2,08%	2,18%	2,28%	2,38%	2,48%

Source: Simulation of the author based on $ITRC_c$ for 2017

Notes:

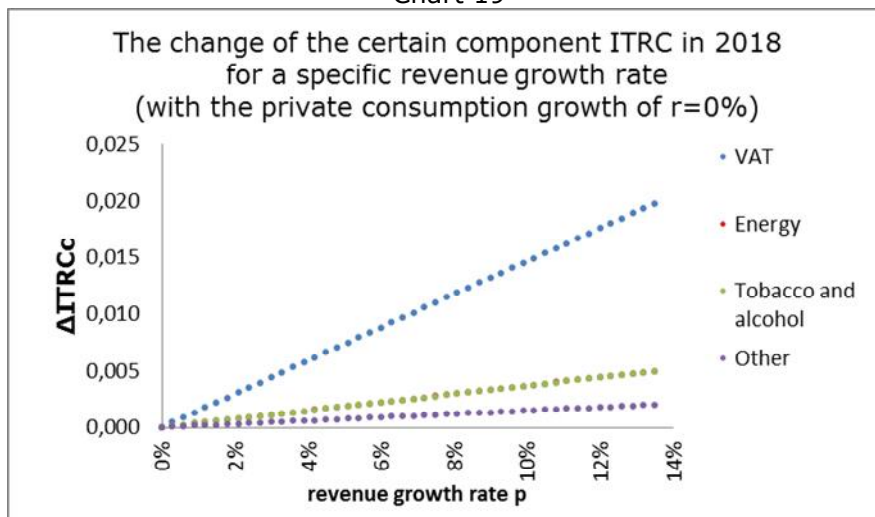
In the simulation were used the real levels of components of ITRC from 2017 $ITRC_{C(2017)}$. The assumption is that the private consumption in 2018 will grow at the rate $r = 3,3271\%$ according to the projections of the Directorate for Economic Planning of B&H.

There are calculated the revenue growth rates of individual components (p) for the specific changes in components $ITRC_c$ ($\Delta ITRC_c$), according to the Equation $p_c = (\Delta ITRC_c : ITRC_{C(y-1)} + 1) * (r+1) - 1$

Change in the projected growth rate of consumption

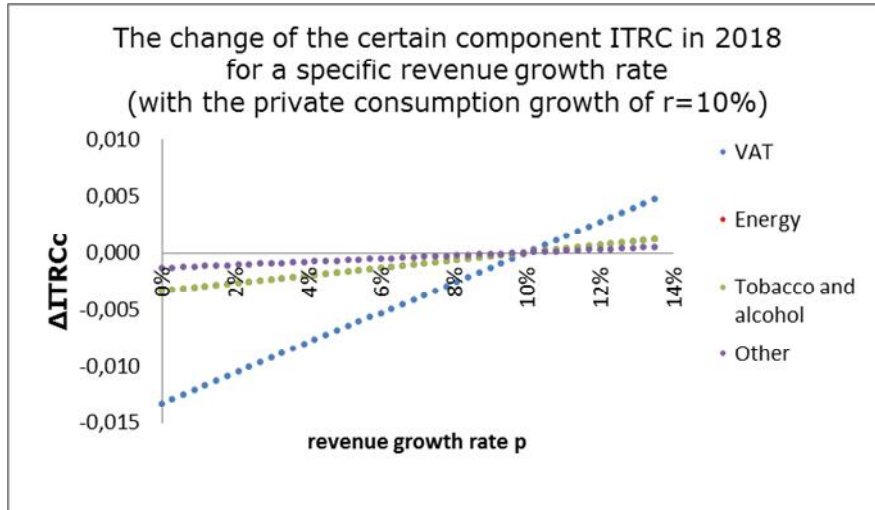
The simulation allows the changes in projected growth rates of consumption in 2018, so for the growth rates of, for example, 0% and 10%, it would look like in Charts 19 and 20. Logically, the higher the growth rate of consumption is, the smaller the growth rate of a particular component ITRC_C will be, with the same revenue growth.

Chart 19



Source: Simulation of the author based on ITRC_C for 2017

Chart 20



Source: Simulation of the author based on ITRC_C for 2017

Literature and data sources:

- European Commission ,Directorate General Taxation and Customs Union, "Taxation Trends in the European Union; Data for the EU Member States, Iceland and Norway", 2017 Edition
- European Commission ,Directorate General Taxation and Customs Union, Data on taxation, https://ec.europa.eu/taxation_customs/business/economic-analysis-taxation/data-taxation_en
- Indirect Tax Authority of B&H
- Agency for Statistics of B&H
- Directorate for Economic Planning of B&H
- Bulletins of Macroeconomic Analysis Unit (Issues: 75, 105, 129, 154-155)