

## ASSESSMENT OF LAFFER POINTS OF THE I AND II TYPES OF VAT (ON THE EXAMPLE OF RUSSIAN FEDERATION, KAZAKHSTAN AND AZERBAIJAN REPUBLICS

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### ABSTRACT:

Tax burden, i.e. the ratio of the tax revenues and the aggregate taxable income, is an important macroeconomic variable and economic policy instrument which account for the tax burden and the revenue structure in the economy. The macroeconomic regulation function in the context of taxation comes to its own mainly over the value added tax (VAT). The effectiveness fiscal policy in general as well as tax policy in particular depends mainly on the VAT-level in the economy. In the framework of this paper we focus on the performance three post-Soviet Republics, Russian Federation, Azerbaijan and Kazakhstan in terms of the VAT-policy and its efficiency. Due to the completely new emergence of the tax system in all three mentioned states, the paper in hand is a kind of assessment of the different economic policy approaches in these three country cases. From this point of view, a comparative analysis of the present situation of the tax system of these countries is an interesting area. We estimate the optimal levels of the tax burden on VAT on the basis of econometric models and the Laffer points of the types I and II were determined for each case study. It should be noted that the Laffer point of the type I is the level of tax burden at which the volume of total output reaches its maximum, and at the Laffer point of the type II, the amount of tax revenue reaches its maximum.

**Key words:** taxes, tax burden, VAT, optimal tax burden, Laffer point.

**JEL classification:** C1, C13

### 1. INTRODUCTION

As it is known, taxes have 5 main functions: fiscal, distributing, regulating, integrating and controlling functions. All types of taxes in varying degrees, perform one or more of these functions. Along with ensuring a substantial part of budget revenues, VAT also performs the function of the regulation. By calculating and reimbursing VAT at all stages of production, as well as the collection of this tax from the final consumer, it is possible to control the economy at all levels. Despite

this, under conditions of imperfect tax legislation and administration, high VAT rates can lead to tax evasion and the shadow economy to flourish. We also have to note that in Russia and Azerbaijan VAT has been applied since January 1, 1992, and in Kazakhstan since July 1, 1995. Both in Russia and Azerbaijan since the VAT has been implemented, its rate was 28 percent of the value added, but then gradually decreased and stopped at the level of 18 percent. But in Kazakhstan, VAT initially began to be taxed at a rate of 20 percent, but later this has been lowered and now is 12 percent.

## **2. THE RELEVANCE OF RESEARCH**

The optimal level of tax burden is the level at which the volume of tax revenues to the budget, as well as the volume of gross domestic product reaches its maximum value, while the levels of tax evasion and the shadow economy decrease. The theory expressing the dependence of the volume of tax revenues on the level of tax burden was first proposed by the American economist Arthur Laffer. It should be noted that this approach cannot cover all the factors affecting tax revenues, which is why this theory has its opponents. Despite this, the calculation of the optimal level of tax burden does not lose its relevance for countries rich in natural resources, as well as with a high level of shadow economy [Yadulla Hasanli. 2014; Yadulla Hasanli, Nazim Hajiyev, Fail Kazimov. 2019; Y Hasanli, S Bayzakov, V Valiyev, G Sarsembaeva. 2011; Adalat Muradov, Yadulla Hasanli, Nazim Hajiyev 2019; Yadulla Hasanli, Simrah Ismayilova. 2017; Gorkhmaz Imanov, Yadulla Hasanli. 2014]. One of the functions that taxes perform is to control the economy at all levels of production and sales of goods. Better than all other types of taxes, this function can be performed by VAT. Therefore, achieving an optimal level of VAT helps to improve the efficiency of fiscal and tax policies, among other things.

In order for a tax policy to be effective, a very important condition is that the tax burden should be at an optimal level [Balatsky E.V. 2005]. In some countries, studies have been conducted in order to calculate the optimal rate of various taxes [Balatsky E.V. 1997, 1999; Hasanli Y. 2007; Kalbiyev Y. 2005; Movshovich S.M., Sokolovsky L.E.1994; Aynur Sabir Suleymanova, Gunay Fazil Rahimli. 2019; Yadulla Hasanli, Nazim Hajiyev, Aynur Suleymanova. 2018].

Considering the fact that a comparative analysis of optimal VAT rates for Russia, Kazakhstan and Azerbaijan was never carried out, we decided to calculate the optimal level of VAT tax burden for these three countries using econometric tools, and then carry out a corresponding analysis [Dimitrios Asteriou, Stephen G.Hall. 2016; Magnus Y.R., Katyshev P.K., Peresetsky A.A. 2004; Tikhomirov N.P., Dorokhina E.Y. 2003; Valentinov V.A. 2006]. It should also be noted that the

research to calculate the optimal level of tax burden on VAT can be used to implement effective tax policy in such economic situations as a sharp decline in world oil prices and the global crisis.

As we know, in order to calculate the optimal level of tax burden as a way to the improve the fiscal policy, two types of Laffer points are distinguished in research. The first and second kind of laffer points are levels of tax burden at which GDP and tax revenues reach their maximum, respectively.

### **3. THEORETICAL AND METHODOLOGICAL BASES FOR EVALUATING THE OPTIMAL LEVEL OF VAT**

We have to note that despite the fact that the Laffer theory was proposed by an American economist, yet in subsequent years other American economists have criticized this theory. By contrast, Russian scientists began to study the geometric characteristics of the Laffer curve. It should also be noted that it was Russian scientists who introduced such concepts as Laffer points and identified the differences between them. [Balatsky E.V. 2003].

It should be noted that in order to calculate the optimal VAT rate, it would be advisable to identify the dependence of volumes of GDP and tax revenues on the VAT rate. In the Russian Federation and the Republic of Azerbaijan, during the period under study, that is, from 2006 to 2017 there were no changes in the VAT rates. Consequently, the problem of multicollinearity arose during the construction of the models. And it was decided to build models not based on VAT rates, but based on the VAT tax burden.

In order to determine the optimal level of the tax burden on VAT, information was collected on the volume of GDP and VAT revenues in Russia, Azerbaijan and Kazakhstan from 2006 to 2017. The tax burden on VAT was calculated as the ratio of tax revenues for VAT to GDP. The optimal the level of the tax burden on VAT was determined by econometric modeling of the dependence of GDP and VAT revenues on the tax burden for VAT.

### **4. REALIZATION OF MODELS: EVALUATION OF OPTIMAL LEVEL OF THE TAX BURDEN ON VAT FOR RUSSIAN FEDERATION, AZERBAIJAN AND KAZAKHSTAN REPUBLICS**

First we will try to determine the level of tax burden on VAT that maximizes GDP for Russian Federation. For this we estimate the following regression equation.

$$\text{LOG}(\text{GDP\_CURP\_NC\_RF}) = \text{C}(1)*\text{VAT\_TB\_RF} + \text{C}(2)*\text{VAT\_TB\_RF}^2 + [\text{AR}(1)=\text{C}(3)] \quad (1)$$

Here GDP\_CURP\_NC\_RF is GDP at current prices of the Russian Federation, VAT\_TB\_RF is the level of tax burden on VAT in Russian Federation.

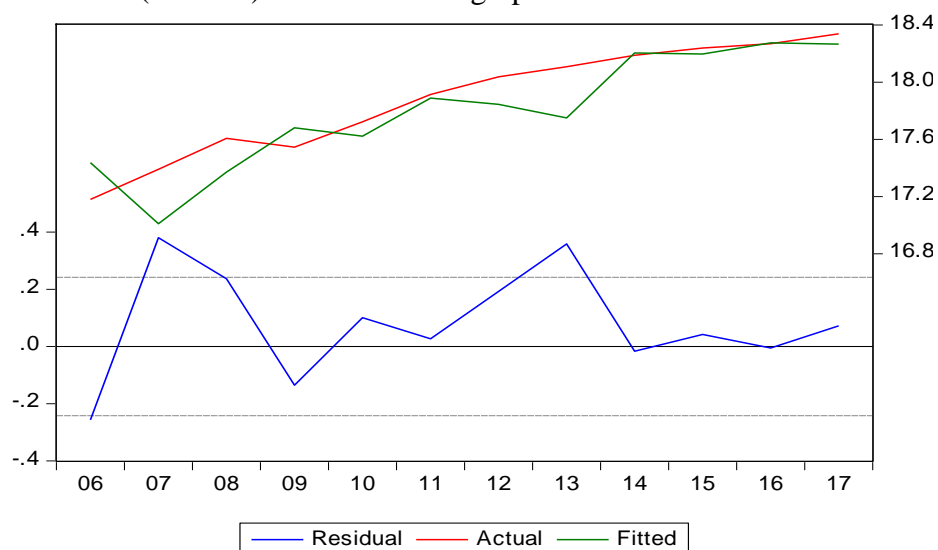
The following result was obtained from the econometric evaluation of the regression equation (1):

$$\text{LOG}(\text{GDP\_CURP\_NC\_RF}) = 6.41058559254 * \text{VAT\_TB\_RF} - 0.575389897779 * \text{VAT\_TB\_RF}^2 + [\text{AR}(1) = 0.902725244679] \quad (2)$$

(t-Statistic) (46.74186) (-35.33396)

R-squared = 0.707600; Adjusted R-squared = 0.597950; Durbin-Watson stat = 1.779558

A plot of the actual, calculated from the model (fitted) logarithmic values of GDP and their difference (residual) is shown in the graph 1.



Graph 1. Plot of the Actual, Fitted (2) and Residual of logarithmic values of GDP in Russian Federation.

The statistical indicators of the regression equation (2) give the reason to say that the model is adequate. The optimal level of tax burden on VAT received from this equilibrium was **5.57** percent.

Now we will try to determine the VAT rate that maximizes revenues of VAT (the II type Laffer point) in Russian Federation. For this we will estimate regression equation (3).

$$\text{LOG}(\text{VATR\_RF}) = C(1) * \text{VAT\_TB\_RF} + C(2) * \text{VAT\_TB\_RF}^2 + [\text{AR}(1)=C(3)] \quad (3)$$

Here, VATR\_RF – shows the value of the VAT revenues in Russian Federation.

The results obtained from econometric estimation of the regression equation (3) are as follows.

$$\text{LOG}(\text{VATR\_RF}) = 5.17641069329 * \text{VAT\_TB\_RF} - 0.448446728509 * \text{VAT\_TB\_RF}^2 + [\text{AR}(1) = 0.92992889804] \quad (4)$$

(*t-Statistic*) (34.66026) (-28.34105)

*R-squared* = 0.763702; *Adjusted R-squared* = 0.675090; *Durbin-Watson stat* = 1.683901

The statistical indicators of the regression equation (4) and statistical tests give the reason to say that the model is adequate.

According to the model (4) we get the optimal level of tax burden on VAT for Russian Federation as **5.77** percent. As can be seen the Laffer points of type I and II for the Russian Federation turned out to be quite close. It also should be noted that in 2017 in Russia the level of tax burden on VAT was 5.6 percent which was lower than the Laffer points of both I and II types. Based on this result, we can reasonably conclude that an increase in the VAT rate from 18 percent to 20 percent in the Russian Federation effective 2019 will approximate the optimal level of the tax burden on VAT.

And now we turn to the task of determining the optimal level of the tax burden on VAT for the Republic of Kazakhstan. We should note that, the model obtained from the econometric estimation of the regression equation for evaluating the type I Laffer point, in other words the level of tax burden of VAT that maximizes the value of GDP, was not adequate. So let's move on to the calculation of the II type Laffer point, that is the level of the tax burden on VAT that maximizes the value of tax revenues. This requires an estimation of the following regression equation:

$$\text{VATR\_KR} = C(1) * \text{VAT\_TB\_KR} + C(2) * \text{VAT\_TB\_KR}^2 \quad (5)$$

Here, VATR\_KR is the value of VAT revenues in The Republic of Kazakhstan and VAT\_TB\_KR is the tax burden on VAT.

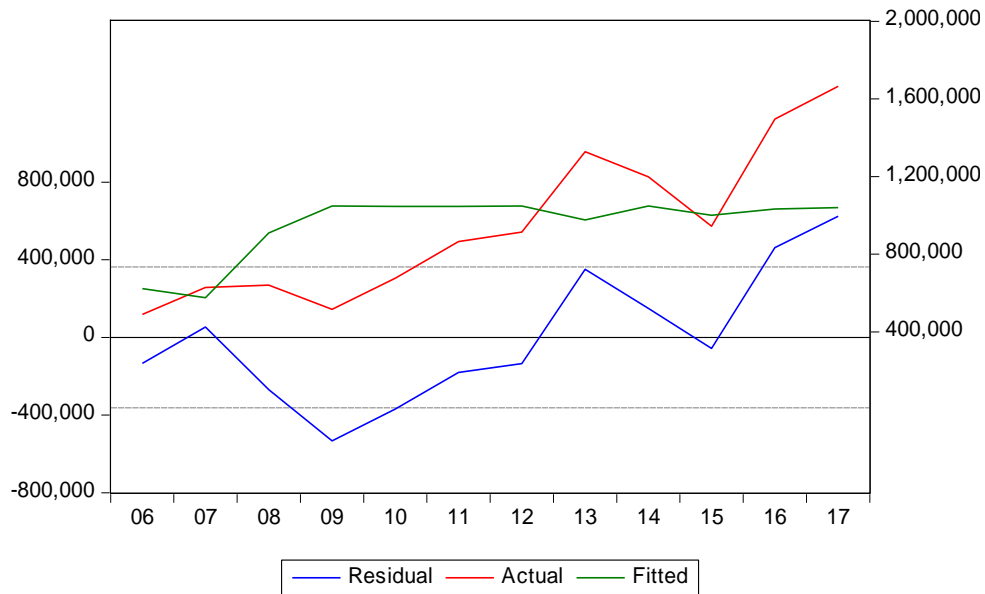
The following result was obtained from the econometric evaluation of the regression equation (5):

$$\text{VATR\_KR} = 715986.199346 * \text{VAT\_TB\_KR} - 122141.527157 * \text{VAT\_TB\_KR}^2 \quad (6)$$

(*t-Statistic*) (5.080809) (-3.347668)

*R-squared* = 0.223430; *Adjusted R-squared* = 0.145773; *Durbin-Watson stat* = 0.673974

The graphic representation of the dynamics of actual, calculated from the model (fitted) values of VAT revenues and their difference (residual) for the Republic of Kazakhstan, is shown in graph 2.



Graph 2. Plot of the Actual, Fitted (6) and residual values of VAT revenues for the Republic of Kazakhstan.

According to the equation (6), the level of tax burden on VAT that maximizes VAT revenues in the Republic of Kazakhstan equals 2.93 percent. For comparison, we can note that, in 2017 the level of tax burden on VAT was 3.2 percent. From this result, we can reasonably conclude that for reaching the maximum level of VAT revenues in the Republic of Kazakhstan it is advisable to reduce the VAT rate.

And now let's try to determine the optimal level of tax burden on VAT for The Republic of Azerbaijan. First we estimate the following regression equation for evaluating the type I Laffer point:

$$\text{LOG}(\text{GDP\_CURP\_NC\_AZE}) = C(1) + C(2)*\text{VAT\_TB\_AZE} + C(3)*\text{VAT\_TB\_AZE}^2 + [\text{AR}(1)=C(4)] \quad (7)$$

Here GDP\_CURP\_NC\_AZE is GDP at current prices of the Republic of Azerbaijan, VAT\_TB\_AZE is the level of tax burden on VAT in the Republic of Azerbaijan.

The results obtained from econometric estimation of the regression equation (7) are as follows:

$$\text{LOG}(\text{GDP\_CURP\_NC\_AZE}) = 16.0031111494 + 1.28972141689*\text{VAT\_TB\_AZE} - 0.243851860273*\text{VAT\_TB\_AZE}^2 + [\text{AR}(1)=0.934762422515] \quad (8)$$

(t-Statistic) (40.37882) (2.592171) (-2.379073)

R-squared = 0.900117; Adjusted R-squared = 0.843041; Durbin-Watson stat = 1.667635

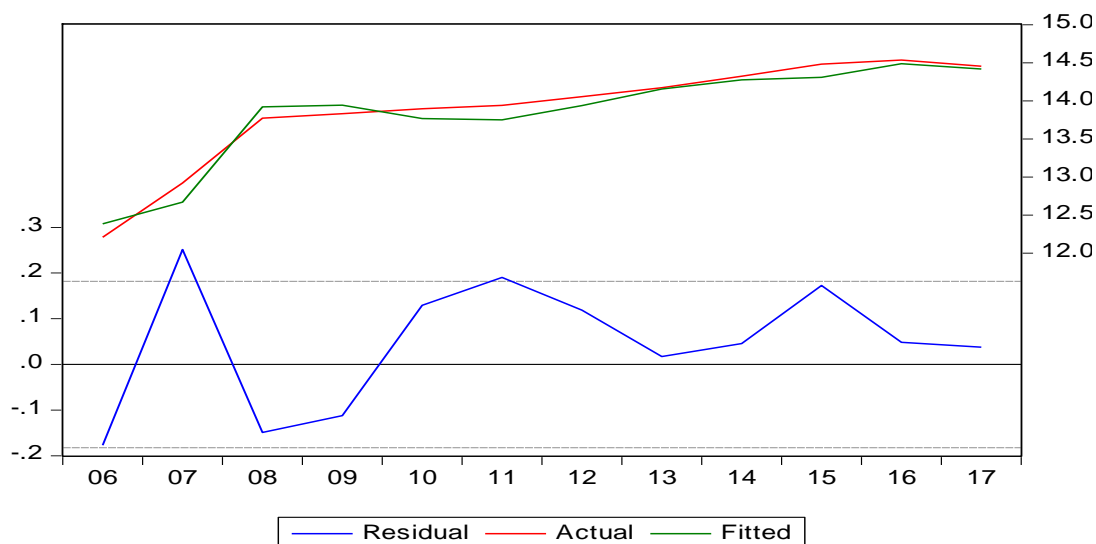
From equation (8) we obtain the level of tax burden that maximizes the value of GDP in The Republic of Azerbaijan as equal to **2.64** percent.

And now we can estimate the following regression equation for evaluating the II type Laffer point for the Republic of Azerbaijan:

$$\text{LOG}(\text{VATR\_AZE}) = C(1) + C(2)*\text{VAT\_TB\_AZE} + C(3)*\text{VAT\_TB\_AZE}^2 + [\text{AR}(1)=C(4)] \quad (9)$$

Here, VATR\_AZE is the value of VAT revenues in the Republic of Azerbaijan. The following result was obtained from the econometric evaluation of the regression equation (9):

$$\begin{aligned} \text{LOG}(\text{VATR\_AZE}) = & 10.5167836735 + 2.28999268034*\text{VAT\_TB\_AZE} - 0.356455697876*\text{VAT} \\ & \text{\_TB\_AZE}^2 + [\text{AR}(1)=0.894916682525] \quad (10) \\ (t\text{-Statistic}) & \quad (25.26346) \quad (4.509341) \quad (-3.180596) \\ R\text{-squared} = & 0.955045; \text{ Adjusted } R\text{-squared} = 0.929357; \text{ Durbin-Watson stat} = 1.959042 \end{aligned}$$



Graph 3. Plot of the Actual, Fitted (10) and Residual values of VAT revenues for the Republic of Azerbaijan.

The statistical indicators of the regression equation (10) show that the model is adequate. Based on the results obtained from this equation, the level of the tax burden on VAT that maximizes the VAT revenues in the Republic of Azerbaijan equals **3.21** percent.

A summary of the results of the research conducted to determine the optimal level of the tax burden on VAT are given in the following table:

Table 1. Comparison of the optimal level of the tax burden on VAT in Russian Federation, Kazakhstan and Azerbaijan Republics.

Russian Federation		The Republic of Kazakhstan		The Republic of Azerbaijan	
I type Laffer point	II type Laffer point	I type Laffer point	II type Laffer point	I type Laffer point	II type Laffer point
5.57	5.77	-	2.93	2.64	3.21

Source: This table was calculated by Author.

The results obtained from this research are given below:

- The level of tax burden on VAT that maximizes the value of GDP in Russian Federation equals 5.57 percent, and the tax burden that maximizes the value of VAT revenues equals 5.77 percent. It should be noted that in 2017 in Russia, the level of tax burden on VAT was 5.6 percent which was lower than both I and II type of the Laffer points. Based on this, we can conclude that effective 2019, an increase in the VAT rate from 18 percent to 20 percent in the Russian Federation will approximate the level of the tax burden on VAT to the optimal level.

- It was impossible to determine the I type Laffer point for The Republic of Kazakhstan, but the II type Laffer point was 2.93 percent.

For The Republic of Azerbaijan the I type Laffer point equals to 2.64 percent, and the II type Laffer point equals to 3.21 percent.

## **5. CONCLUSION**

When analyzing the tax burdens obtained as a result of the study as shown in Table 1, we see that the optimal tax burden on VAT for the Russian Federation derived from the model exceeded the tax burden of 5.6 percent recorded in 2017. And the optimal tax burden on VAT for the Republic of Kazakhstan derived from the model is lower than the tax burden of 3.2 percent registered in 2017. Hence, we conclude that to achieve the maximum level of VAT revenues in the Republic of Kazakhstan, it would be reasonable to gradually reduce the tax burden to a level of 2.93 percent. We also see that the Laffer points obtained as a result of the research for the Republic of Azerbaijan are slightly different from each other, or rather, their difference is 0.57 points. Also, in comparison with the tax burden registered in 2017, the Laffer point of the first kind obtained as a result of the study is lower, and the Laffer point of the second kind is higher. Analysis of the results obtained for the Republic of Azerbaijan gives us the reason to say that to stimulate economic growth, and at the same time to increase the ratio of VAT revenues to the budget, it is

advisable to reduce the tax burden on VAT from the current 2.7 percent to a level of 2.64 percent. Given the fact that the current VAT rate in Azerbaijan is 18 percent, to achieve the optimal level of VAT revenues, the rate should be reduced to about 17 percent. It should also be noted that although the VAT rate in Azerbaijan is 18 percent, the reason that the tax burden turned out to be so low is that some types of activities in Azerbaijan are exempted from VAT, and some are taxed to VAT at a zero rate. A case in point, the firms producing a significant proportion of GDP engaged in hydrocarbon activities based on the Production Sharing Agreements are subject to zero-rate VAT. On the other hand, to maximize the ratio of tax revenues to the budget, it is possible to increase the tax burden to 3.21 percent. But in that case, the economic growth in the country will suffer significant loss and this, in turn, will lead to a decrease in economic activity and also to the decline in the volume of VAT receipts in the state budget.

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