



# THE INFLUENCE OF PRIVATE CONSUMPTION AND THE RATE OF VAT ON THE AMOUNT OF VAT COLLECTED AT THE GENERAL CONSOLIDATED BUDGET

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## Abstract

Of taxing consumption and therefore are of major importance in any market economy. Knowledge of economic phenomena that occur on consumption and taxation are important to model and forecast the effects of certain economic and fiscal policies, their influence spread at both micro and macro economics.

**Keywords:** tax, VAT, the VAT rate, private consumption, general government budget.

## INTRODUCTION

Each consumer seeks to maximize the utility that you can get income available. This is achieved by direct confrontation of his preferences for different goods with income (as a resource) available. On these grounds, we can say that in general consumption largely depends largely on the cost of acquisition of goods and services which the consumer purchases. The value of goods and services is strongly influenced by taxation and consequently has a strong influence on consumption. With tax governments can regulate how evolutionary consumption in the national economy or its parts.

Tax with respect greatest influence on consumption and on budget revenues from consumption is VAT. So analyze the influences that it

induces tax on consumption, ie that the effects on consumption in VAT revenues is important to know, based on the results being able to shape macroeconomic policies stimulating or calming consumption.

VAT or amount in VAT revenues in the consolidated general budget of major importance on the evolution of macroeconomic indicators. In this analysis is not without importance they place influences in budget revenues on VAT, private consumption that VAT rates applied.

To see a connection between the indicators chosen and presented above, existing data in the following table build national statistics:



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Table 1 Evolution proceeds from VAT, private consumption and VAT rates in the period 1993 – 2014

Year	Cashing VAT in BGC	Private consumption	VAT rate	Year	Cashing VAT in BGC	Private consumption	VAT rate
	billion RON	billion RON	%		billion RON	billion RON	%
1993	0,07	1,27	18,00	2004	11,27	191,50	19,00
1994	0,23	3,14	18,00	2005	13,02	226,93	19,00
1995	0,38	4,85	18,00	2006	27,76	268,44	19,00
1996	0,54	7,53	18,00	2007	31,24	313,22	19,00
1997	1,17	18,62	18,00	2008	40,88	370,62	19,00
1998	2,25	27,86	21,67	2009	34,32	357,07	19,00
1999	3,25	45,33	22,00	2010	39,25	368,50	21,50
2000	5,04	63,46	19,00	2011	47,92	405,26	24,00
2001	5,18	91,72	19,00	2012	50,52	420,30	24,00
2002	7,26	116,90	19,00	2013	51,83	449,04	24,00
2003	9,55	149,40	19,00	2014	50,88	467,30	24,00

Source: Prepared by the author based on data from Romanian Statistical Yearbook 2007-2014

Graph drawing values from Table 1 get:

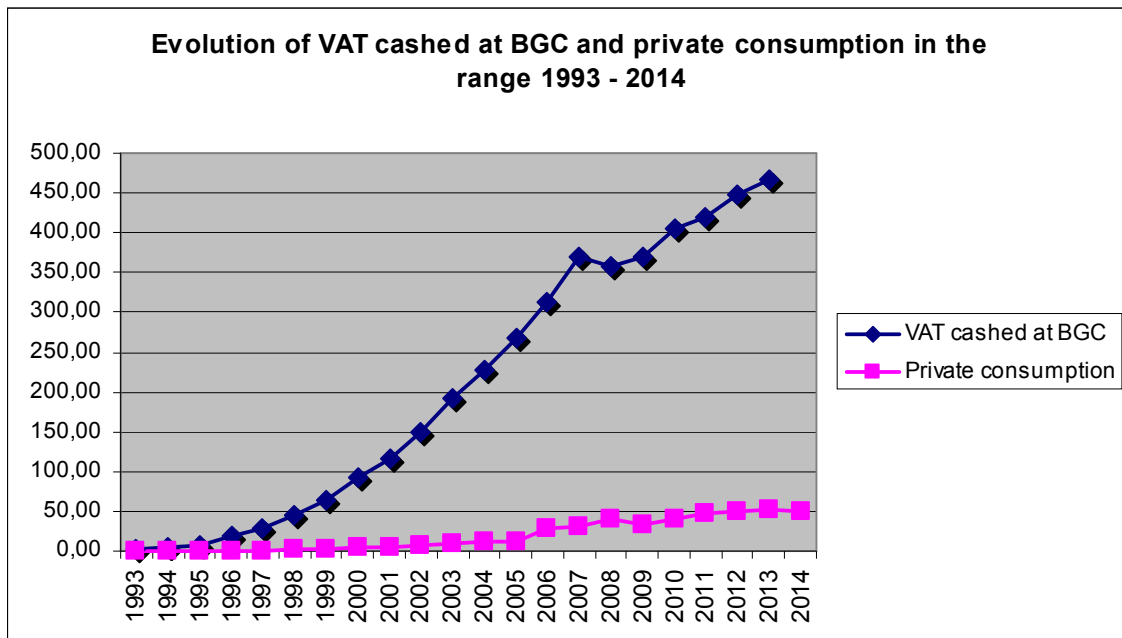


Fig. 1 Evolution of VAT cashed at BGC and private consumption in the period 1993 – 2014

### TESTING THE MODEL

We will try below to find a functional relationship between revenues from VAT in general consolidated budget (VAT) on the sidelines as the endogenous variable that private consumption (PRC) and the rate of

VAT practiced (cVAT) for the period analyzed as exogenous variables on the other hand.

Using the data in Table 1 and Microsoft Excel spreadsheet program using statistical program StatsDirect, check data presented in Table 1, It follows:



Table 2 Table econometric analysis of the relationship between VAT, PrC and cVAT

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0,98520
R Square	0,97061
Adjusted R Square	0,96752
Standard Error	3,56479
Observations	22

ANOVA					
	df	SS	MS	F	Significance F
Regression	2	7973,83906	3986,91953	313,73953	2,80474E-15
Residual	19	241,44701	12,70774		
Total	21	8215,28607			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	-23,53032	8,65875	-2,71752	0,01366	-41,65329	-5,40735
X Variable 1	0,10470	0,00610	17,15220	5,09322E-13	0,09193	0,11748
X Variable 2	1,11998	0,46761	2,39509	0,02708	0,14125	2,09870

Checking table 1. and StatsDirect program, we get:

**Multiple linear regression**

Intercept	b0 = -23,530323		t = -2,71752	P = 0,0137
PrC	b1 = 0,104702	r = 0,969193	t = 17,152203	P < 0,0001
cVAT	b2 = 1,119977	r = 0,481563	t = 2,395093	P = 0,0271

$$TVA = -23,530323 + 0,104702 \text{ PrC} + 1,119977 \text{ cVAT}$$

**Analysis of variance from regression**

Source of variation	Sum Squares	DF	Mean Square
Regression	7973,839057	2	3986,919529
Residual	241,447011	19	12,707737
Total (corrected)	8215,286068	21	

Root MSE = 3,564791  
F = 313,739527 P < 0,0001  
Multiple correlation coefficient (R) = 0,985195  
R<sup>2</sup> = 97,061003%  
Ra<sup>2</sup> = 96,751635%

Based on the above calculation equation of dependence between the amounts of VAT collected at the general consolidated budget that private

consumption and the rate of VAT on the period considered, is given by the equation:

$$TVA = -23,53032 + 0,10470 \cdot C \text{ Pr} + 1,11997 \cdot cTVA \quad (2.1)$$



Interpretation of results **SUMMARY OUTPUT** table, table 2:

**Multiple R = 0,98520** show that between VAT amounts received from the general budget and that private consumption rate of VAT, the analyzed period there is a strong linear relationship.

**R Square = 0,97061** shows that 97,06% of the variance in VAT amounts received from the general budget is explained by the influence that private consumption rate of VAT, the analyzed period.

**Standard Error = 3.56479** is the standard deviation calculated. If the value is zero means that all values are the regression line.

Interpretation of the results of the **ANOVA** table, table 2:

In this table is calculated testu F by means of which the regression model are validated. Since  $F = 313,73953$  and Significance F (materiality) is  $2,80474 \cdot 10^{-15}$  (lower value like 0.05) and  $F_{\alpha, k, n-k-1} = F_{0,05, 2, 19} = 3,52 < F_{calculating}$  so the model obtained from data in table 2 is statistically valid relationship and 2 can be used to explain the correlations determined the relationship between VAT and PrC respectively cVAT.

**Intercept** is the constant term and has a calculated value of  $-23,530323$ . At this point all the explanatory variables are 0. So as the amount of VAT cashed to the consolidated budget that would get if there were no private consumption rate of VAT that would be 0 would  $-23,530323$  billion lei. Since t is calculated  $-2,71752$  and materiality P-value is  $0,01366 < 0,05$  means that the coefficient is significant (probability of 100 to  $1.3660 = 98.6340\% > 95\%$ , as established initial). The fact that the lower limit of the confidence interval is negative and the upper limit is positive ( $-41,65329 \leq a \leq -5,40735$ ) shows that private consumption different from 0 and different VAT rate of 0, the constant term can to decrease or increase  $-41,65329$  billion lei to  $-5,40735$  billion lei.

**Variable X 1 (PrC)** is the exogenous variable - private consumption and has a calculated value of  $0,10470$ , what means that the growth in private consumption with a billion RON, the amount of VAT charged to the general consolidated budget will increase by  $0,10470$  billion RON. Since the calculated t is  $17,15220$  and materiality P-value is  $5.09322 \cdot 10^{-13} < 0,05$  means that the coefficient is significant (probability 100 to  $5.09322 \cdot 10^{-13} = 99.9999999999959\% > 95\%$ , as originally agreed). Confidence interval ( $0,09193 \leq b_1 \leq -0,11748$ ) shows that the private consumption, the VAT charged to the general consolidated budget may vary within the above calculated and therefore may decrease by up to  $0,11748$  billion RON.

**Variables X 2 (cVAT)** is exogenous variable - VAT rate (cVAT) and has a calculated value of  $1,11998$ , what means that an increase in VAT by one percent, VAT will be charged to the general consolidated budget cashed by  $1,119,98$  billion RON. Since t calculated is  $2,39509$ , and materiality P-value is  $0.02708 < 0.05$  means that the coefficient is significant (probability 100 to  $0.02708 = 99.97292\% > 95\%$ , as initially established). Confidence interval ( $0,14125 \leq b_2 \leq 2,09870$ ) shows that the rate of VAT, the VAT cashed to the general consolidated budget may vary within the above calculated and therefore can increase by up to  $2,09870$ , billions RON.

As follows from the VAT cashed from the consolidated general budget and private consumption rate of VAT that the analyzed period there is a strong relationship model explaining 97,061% of evolution VAT cashed to the consolidated general budget in terms of the rate of private consumption VAT applied.

Calculating correlation between the variables described, we have:

**Table 3 Table correlations between VAT, PrC, cVAT**

	VAT	PrC	cVAT
VAT	1		
PrC	0,980682	1	
cVAT	0,718006	0,659986	1

As shown in table 3 based on calculations made, there is a strong correlation between VAT and PrC direct the value of  $0,980682$ , respectively cVAT and VAT the value of  $0.718006$  and this confirms the veracity of the econometric model calculated.

Next to verify the veracity of the model obtained, multicollinearity test criteria of exogenous variables. Klein's use criteria which said two exogenous variables are collinear if the condition:

$$R_y^2 < r_{x_i/x_j} \quad (2.2)$$

The data obtained from tables 2.1 and 2.2 we  $0.97061 < 0.65998$ . What relationship is not fulfilled, we can say that the exogenous variables do not have the phenomenon of multicollinearity.

Based on these considerations we can validate Introduce econometric model described in equation (2.1). Model shown explain, as noted in the description of elements calculated in proportion of 97.06% variation VAT cashed to the consolidated general government depending on private consumption and the rate of VAT practiced.



## CONCLUSIONS

Our analysis can give the following conclusions:

1. VAT cashed to the consolidated general government is influenced by private consumption and the VAT rates applied.
2. Every billion lei taking private consumption plus VAT cashed to the general consolidated budget increase to 0,1 billion RON.
3. Cite VAT increase by 1% VAT cashed to the general consolidated budget increases 1,11 billion RON.

We must observe that automatically leads to stimulate consumption and GDP growth, generating more sustainable growth in national GDP than the version that we increase the rate of VAT. If the VAT rate increase acceptance phenomenon appears to pay, what after a certain rate of VAT may also lead to reduced VAT revenues in the consolidated general government. The veracity of this AFIM is demonstrated by the correlation between the VAT cashed to the consolidated general government or private consumption and the rate of VAT practiced. The correlation was strongest between VAT cashed to the consolidated general government and private consumption (see table 2.2)

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