

## MANAGEMENT MODEL OF THE CORRELATION BETWEEN THE RATE OF TAX PRESSURE AND THE FLOW OF INLAND REVENUE. THE LAFFER CURVE

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**Abstract:** The adaptation to the Romanian macroeconomic realities of the theory according to which an increase in the tax pressure will not necessarily entail the corresponding increase of the Inland Revenue, but in exchange, the decrease of the tax pressure will create favorable conditions for the increase of the inland revenue, implies the creation of correlative models to support the idea and to provide a proper management at macroeconomic level. Such a model is the one using as statistic instrument the Laffer Curve starting from the concrete data of Romanian economy.

**Key words:** Rate of tax pressure, normal range, prohibitive range, Inland Revenue, fiscal facilities

### The theoretic basis of the Laffer law

Using as analysis base the market economy in the U.S.A. also influenced by mathematic reasoning, the American economist Arthur B. Laffer renders evident, through a curve, the connection between the rate of tax pressure and the flow of the inland revenue, currently known as **The Laffer Law**. This rapidly became the theoretic ground and the reference basis for theorists of the offer economy.

Analyzing the relation between the tax pressure and the inland revenue, in the work intitled "Taxation, GNP and Potential GNP, proceeding of the business and economics statistics sections"<sup>6</sup>, A. Laffer together with V.A. Canto and D.H. Joines have reached the conclusion that an increase of the tax pressure will not necessarily entail the corresponding increase of the inland revenue, but in exchange, the decrease of the tax pressure will create favorable conditions for the increase of the inland revenue. This conclusion was based on a mathematic reasoning for which the capital and the labor are rewarded depending on the incremental revenue:

$$P = K^\alpha x M^{1-\alpha}, \quad (1)$$

where  $0 < \alpha < 1$

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<sup>6</sup> Human Rights Report – the basis of electronic information including statistics referring to various economic and statistic indicators, <http://www.cato.org/pubs/journal/cj1n1/cj1n1-1.pdf>

$\alpha$  and  $1-\alpha$  = elasticity of the factors K and M  
 P = value of production  
 K = the capital factor  
 M = the labor factor

In the analysis model, a series of simple hypotheses are introduced, for which reason they are considered as a weak point of the theoretic basis:

The rates of compensation of the capital ( $R_V$ ) and labor ( $W_V$ ) factors are achieved by their incremental value and are expressed depending on the value of production (P):

$$R_V = \frac{\partial P}{\partial K} \text{ and } W_V = \frac{\partial P}{\partial M} \quad (2)$$

The net recompensation of the capital (R) and labor (W) factors are different from the gross recompensation ( $R_V$  and  $W_V$ ) because of the rates of taxation ( $t_K$  and  $t_W$ ) applied on the revenues of the factors:

$$R_V = R(1+t_K) \text{ and } W_V = W(1+t_W) \quad (3)$$

The functions of the capital and labor offer are:

$$K_0 = \left(\frac{R}{W}\right)^a x R^e, \quad a < 0, e < 0 \quad (4)$$

$$M_0 = \left(\frac{W}{R}\right)^b x W^e, \quad b < 0, e > 0 \text{ si } a + e > 0; b + e > 0 \quad (5)$$

The expressed hypotheses lead to the following preliminary conclusions:

For a certain production level, any change in the rates ( $R_V$  and  $W_V$ ) of gross recompensation of the factors modifies the demand of enterprises for the capital and labor factors;

Any change in the net recompensations (R and W) of the factors modifies the offer of the management field on the market, under the circumstances where a factor can be substituted to a certain proportion by the other factor.

Therefore,

$$\frac{K_0}{M_0} = \left(\frac{R}{W}\right)^\mu, \quad \text{by } a + b + e > 0 \quad (6)$$

where:  $\mu$  = the elasticity of substitution of the offer factors

According to the last hypothesis, the state budget is considered as balanced and financed based on the taxes applied on the revenues of the factors:

$$IB = t_K RK + t_M WM \quad (7)$$

where: IB = the total amount of inland revenue which finance the state budget;

RK = revenues achieved by the fiscal factor;

WM = revenues achieved by the labor factor;

Under the circumstances of factors substitution, the report between the offered factors is in a balance state with the factors demanded on the market:

$$\frac{K_0}{M_0} = \frac{K_C}{M_0} \quad (8)$$

Using the expressed hypotheses and the mathematic reasonings it is demonstrated that:

Under the circumstances where the total income is entirely distributed in the propositions  $\alpha$  and  $(1 - \alpha)$ , the functions of the demanded capital factor ( $K_C$ ) and labor factor ( $M_C$ ) are:

$$K_C = \frac{\alpha P}{R_V} \quad \text{and} \quad M_C = \frac{(1 - \alpha)P}{W} \quad (9)$$

The ratio between the capital and the demanded labor on the market is influenced by the rates of taxation:

$$\frac{K_C}{M_C} = \frac{\alpha P}{(1 - \alpha)P} \times \frac{(1 + t_M)}{(1 + t_K)} \times \frac{W}{R} \quad (10)$$

The rates of taxation influence the ratio between the gross recompensation of the labor ( $W_V$ ) and the gross recompensation of the capital ( $R_V$ ):

$$\frac{W_V}{R_V} = \frac{1 - \alpha}{\alpha} \left( \frac{1 - \alpha}{\alpha} \times \frac{1 + t_K}{1 + t_M} \right)^{\gamma - 1} \quad (11)$$

As well as the ratio between the net recompensation of the labor ( $W$ ) and the net recompensation of the capital ( $R$ ):

$$\frac{W}{R} = \left( \frac{1 - \alpha}{\alpha} \times \frac{1 + t_K}{1 + t_M} \right)^{\gamma} \quad (12)$$

where:  $\gamma > 0$  and represents the elasticity of substitution of the factors demanded on the market.

The influence of the increase of taxation rates on the production is rendered evident by deriving the production function by the rates of taxation of each factor.

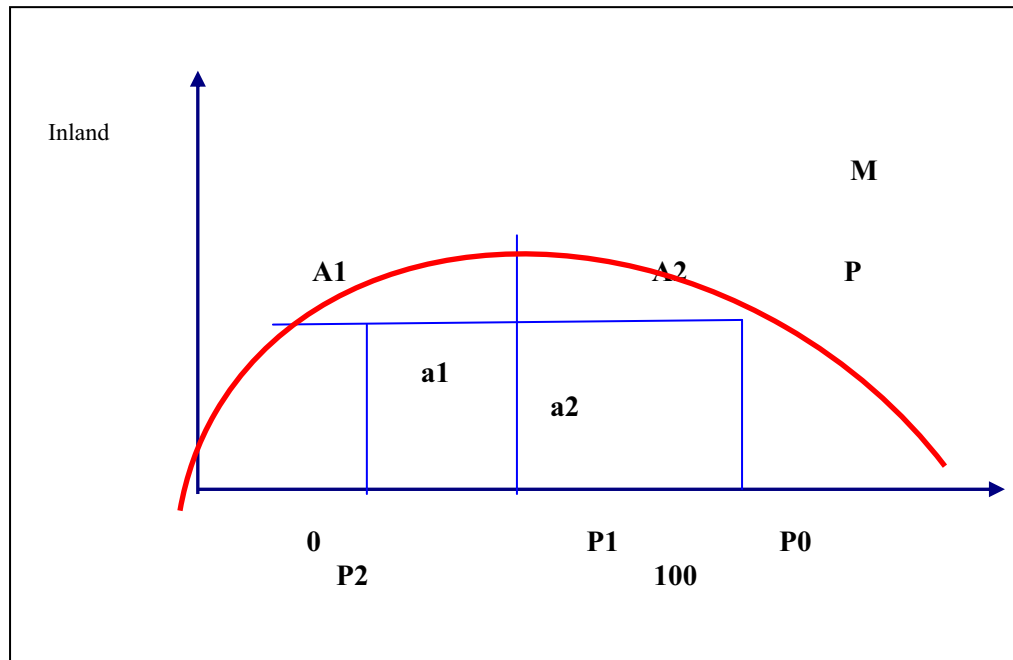
***The resulting conclusion is that aside from the elasticity of the offer, of the capital and labor factors, which generates a variation of the production, the increase of tax pressure entails the decrease of production and does not necessarily entail an important increase of the inland revenue.***

The continuation of the analysis based on the mathematic reasoning, at the level of the function of inland revenue which finances the state budget and the deriving of this equation in relation to the rates of taxation of each factor, have resulted in mathematic relations which have been rendered as a curve named “the Laffer curve”.

*The elaboration and the analysis of the Laffer curve*

The whole of mathematic relations, expressed synthetically, represents the theoretic basis for the elaboration of the Laffer curve which is mentioned in most of the studies on the level of fiscality, particularly because its suggestive attribute and reflects the relation between the tax pressure marked on the abscissa and the inland revenue marked on the ordinate.

The graphic analysis of the Laffer curve (figure 1.) reveals the existence of two areas (OMP<sub>0</sub> and P<sub>0</sub>MP) marked by three points 0, M, P. It may be noticed that when the tax pressure records extreme values (0% and 100%) the inland revenue is null, but the cause is different.



**Figure 1 Laffer curve**

Thus, if the tax pressure is 0% the entire revenue will be allotted to owners of production factors, since there is no difference between the gross and the net recompensation for them and no influence on the production from the state, because it ceases to exist. The level of income is influenced by the preferences of economic subjects concerning spare time. If the tax pressure reaches 100% in a first stage there will be a decrease of the inland revenue and later on these will disappear, because the entire revenue of the factors is taken over by the state, the economic subjects are no

longer interested in carrying out taxable economic activities, in which case the monetary economy will be replaced by the barter economy.

Between the two limits, which are both impossible for a market economy, on the chart there is a point M where the incremental receipt is null:

$$\frac{\partial iB}{\partial t_K} = 0 \quad \text{and} \quad \frac{\partial iB}{\partial t_M} = 0 \quad (13)$$

This corresponds to a level of tax production which maximizes the inland revenue. At M point the production, the inland revenue, the private and public utilities are at maximum level. *The M point represents the threshold of tax pressure which will no longer bring additional receipts for the budget if it is exceeded, generating by contrary their decrease.*

The simple attribute of the hypotheses concerning the elasticity of the rate of fiscal tax bites and the analysis of the curve, considered as a reflection of a country's tax history and the last stage of the evolution of a tax system, made French economist Henri Sempe propose the analysis of only a part of these ( $a_1Ma_2$ ) and thus, the rest of the parts ( $0a_1$  and  $0_2P$ ) to be represented by dotted lines, in order to avoid the risk of reaching a barter economy and of the state's disappearance.

The novelty of the Laffer theory consists in identifying two areas:

***The acceptable area or the “normal range”*** marked by points 0, M and  $P_0$ , where the economic subjects accept the increase of tax pressure because they look for a greater quantity of public utilities. The inland revenue increases, although there is a gradual decrease of the economic activity and taxable materials, some of the economic subjects preferring to increase their spare time to the detriment of the time allotted for labor, while others do the opposite. The rate of increase of inland revenue tends to decrease while the tax pressure increases, but with a decreasing rate:

$$\frac{\partial iB}{\partial t_K} > 0 \quad \text{and} \quad \frac{\partial iB}{\partial t_M} > 0 \quad (14)$$

***The impermissible area or the “prohibitive range”*** marked by points  $P_0$ , M and P, where an important part of the factors' revenue is taken by the state. As a consequence, the economic subjects restrict their taxable activities, while the taxable materials will be less. The economic subjects reject new public utilities, preferring private utilities. While the tax pressure increases, there will be a decrease of production and inland revenue:

$$\frac{\partial iB}{\partial t_K} < 0 \quad \text{and} \quad \frac{\partial iB}{\partial t_M} < 0 \quad (15)$$

It may be noticed that for a low tax pressure  $P_1$ , situated in the “normal range” area and for a very strong tax pressure  $P_2$  situated in the “prohibitive range” area, the same amount will be obtained from the inland revenue.

Determining the area where a country is situated on the Laffer curve depending on the level of tax pressure is therefore difficult, as long as the theoretical maximum

permissible threshold has always been exceeded. As a rule, when a country is situated in the impermissible area, it targets an increase of the taxable materials and of the inland revenue, generated by the stimulating effect of the measures taken for stimulating the production and the investment process.

The same effects are desired also when a country is situated in the permissible area. However in this case it is possible for the effects not to appear, when the population demands new public utilities, the financing of which is not possible or desired in a first stage, because of the rigidifying of the labor offer. Furthermore, a policy of tax relaxation rejects the expansion of public economy to the detriment of the exchange economy, because of the negative effects on the total offer.

The analysis of the tax pressure and of its relation with the amount of inland revenue gives the following conclusions:

Once the rates of taxation have increased up to the point of optimum taxation, there will be an increase of the inland revenue with a rate which tends however to decrease while the tax pressure decreases;

Once the rate of optimum fiscality has been exceeded, the increase of the rates of taxation entails the decrease of inland revenue; when the incremental revenue is null (at the optimum point of the rate of fiscality) the inland revenue is maximum; the variations of the rates of taxation entail variations of the inland revenue which directly depend on the tax pressure exerted on the revenues; the increase of the tax pressure considerably influences the offer of the production factors on the market; the disposition of taxpayers for labor or for spare time influences the predominance either of the revenue effect or of the substitution effect; the decrease of the tax pressure entails the increase of the labor offer, the shifting of the consumption towards savings and investments, the final end being the stimulation of production and economic growth.

### **The Laffer curve for Romania**

As mentioned in a previous paragraph, according to the theory promoted by A. Laffer, inland revenue is directly proportional with the rate of fiscality, *up to a point*, called “the rate of optimum fiscality”, after which this relation becomes inversely proportional. Under these circumstances, it is interesting to study, for Romania, the influence of the tax pressure on the tax income collected at the level of the state’s consolidated general budget, for the period 1990-2005.

In order to work out the Laffer curve for Romania it is necessary to determine both the level of real tax incomes collected for the state’s consolidated general budget, using as reference year the year 1990, and the level of the tax pressure recorded during each year of the analyzed interval.

It must be mentioned that although *it’s necessary to differentiate between tax income and the contributions to social insurance*, the latter being incorrectly included up to the end of 2005 in the category of tax income, however in the analysis carried out in this paragraph (extending over the interval 1999-2005) in the concept of tax income we will also include the contributions to insurance in order to ensure the compatibility of data<sup>7</sup>.

In order to determine the real tax income, based on the data provided by the Romanian National Bank and the Statistics Institute, we will relate the rated tax income

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<sup>7</sup> The new budgetary classification introduced by the OMFP no. 1954/2005 excludes the social contributions out of the category of tax income

to the GNP deflator with a fixed base, the year of reference being, as mentioned, the year 1990. The tax pressure will be determined as a ratio between the total tax income and the gross national product.

The data calculated in this manner, necessary for the elaboration of the Laffer curve for Romania are presented in table no. 4.5.

**Table no. 1 Necessary data for the elaboration of the Laffer curve in Romania for the interval 1990-2005**

Year	Rated tax income* (million lei)	GNP (million lei)	Tax pressure	GNP deflator	Real tax income (million lei)	Variation of real tax income	Variation of tax pressure
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1990	30,5	85,8	35,5	100	30,5	-	-
1991	73,3	220,3	33,2	295,1	24,8	-5,7	-2,3
1992	201,2	603,0	33,5	300,0	22,7	-2,1	0,3
1993	626,6	2.003,6	31,3	327,4	21,6	-1,1	-2,2
1994	1.404,2	4.977,3	28,2	239,1	20,3	-1,3	-3,1
1995	2.080,3	7.213,5	28,8	135,3	22,2	1,9	0,6
1996	2.924,8	10.892,0	26,8	145,3	21,4	-0,8	-2,0
1997	6.701,4	25.292,5	26,5	247,3	19,9	-1,5	-0,3
1998	10.541,6	37.379,9	28,3	155,2	20,1	0,2	1,8
1999	18.493,7	54.573,0	33,8	147,8	23,9	3,8	5,5
2000	23.748,7	80.377,3	29,4	144,3	21,3	-2,6	-4,4
2001	33.145,5	116.768,7	28,3	137,4	21,6	0,3	-1,1
2002	41.739,0	151.4750,9	27,5	123,4	22,1	0,5	-0,8
2003	53.564,9	197.564,8	27,1	119,4	23,7	1,6	-0,4
2004	67.623,6	246.371,6	27,4	115,8	25,9	2,2	0,3
2005	79.032,3	287.186,3	27,5	111,4	27,1	1,2	0,1

\* this category includes rates, taxes and contributions to social insurance

Source: (1): 1990-1999: Romania's Statistic Annuary 2000; 1999-2004: calculated by the author based on the data published in Romania's Statistic Annuary; 2005: [anaf.mfinante.ro/wps/PA\\_1\\_1\\_15H/static/buget/executii/](http://anaf.mfinante.ro/wps/PA_1_1_15H/static/buget/executii/);

(2) Romanian National Bank, Annual reports, 1998-2005

(3) calculated as a ratio between the rated tax income and the GNP

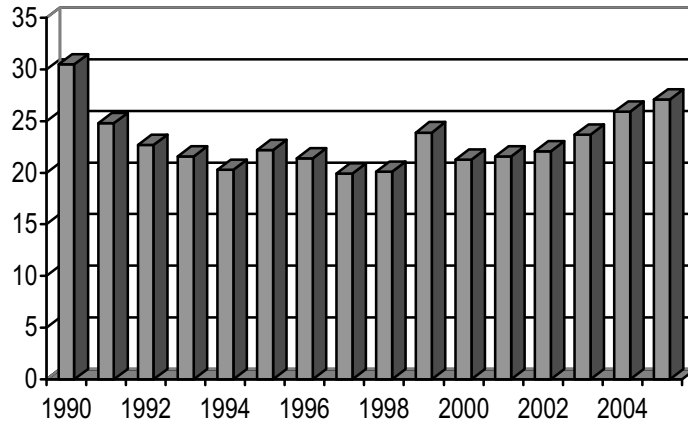
(4) Romanian National Bank, Annual reports, 1998-2005

(5) calculated by the author depending on the rated tax income and the GNP deflator, considering as reference year the year 1990

The analysis of the presented data reveals the following situation:

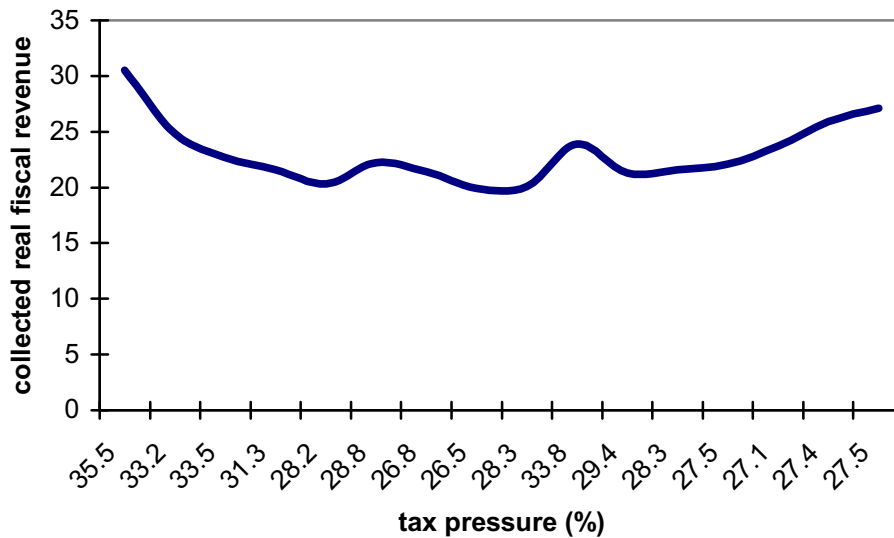
The real tax income, collected for the consolidated general budget has considerably decreased in the first half of the analyzed period, the year 1997 being the year when the lowest level of collecting the tax income for the budget was recorded;

After the year 1997, the evolution of inland revenue collected for the consolidated general budget has had an increasing trend, however at the level of the year 2005 these did not reach the level recorded for the year 1990.



**Figure 2 The evolution of the real tax income in Romania for the interval 1990-2005 (million lei)**

Of course, the varying evolution of the inland revenue must be explained by the overall evolution of the Romanian economy, but also by the expansion (at least until 2004) of the tax evasion phenomena.



**Figure 3 The Laffer curve in Romania**

According to A. Laffer’s theory, depending on the evolution of the inland revenue and the rate of fiscality, two areas can be identified:

**An area considered as “acceptable”,** where the increase (the decrease) of the tax pressure is accompanied by a corresponding increase (decrease) of the revenue for the consolidated general budget;



Analyzing the data presented in table no. 4.5 it may be noticed that in Romania, within the analyzed interval there have been *11 periods of so-called “acceptability”*, respectively the years 1991, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2004 and 2005. Within the mentioned intervals, *the increase of tax pressure has been accompanied by an increase of the revenue for the budget* for 5 years (1995, 1998, 1999, 2004 and 2005), while for the rest of the years (1991, 1993, 1994, 1996, 1997 and 2001) the decrease of the tax pressure entailed a corresponding decrease of inland revenue.

**An area considered as “unacceptable”**, where the increase (the decrease) of tax pressure entails a decrease (an increase) of revenue for the state’s general budget.

The analysis of data reveals the fact that, in Romania, the “inadmissibility” threshold has been reached in 4 of the 15 analyzed years, respectively the years 1992, 2001, 2002 and 2003.

However, we must mention that although it seems slightly illogical to assert that if the decrease of tax pressure entails the decrease of collected tax income, we are situated in the admissible area of the curve, and if the decrease of the tax pressure entails the increase of inland revenue, we are situated in the inadmissible area, the consideration must be carried out, according to the theory issued by Laffer, *in relation to the optimum level of tax pressure* which provides the maximum of receipts, therefore, for the first case the level of the tax pressure is under the optimum level, while for the second case, it exceeds the optimum level.

Although the intention for the elaboration of this curve was to determine a point of the optimum tax pressure, the attempt is rather difficult because we consider it to be delicately to determine such a point concerning absolutely the entire analyzed period. Therefore, if, for example, for the year 1999 a tax pressure of 33,8% at the level of the consolidated general budget was considered as acceptable, for the year 2001 a tax pressure of 28,3% at the level of the consolidated general budget has become unacceptable.

As a conclusion, the fact that the Laffer curve for Romania (chart no. 4.8) does not look like the one presented by the American economist bearing the same name demonstrates that, for the analyzed period, ***the tax pressure can not be considered as a variable of economic behavior or as an economic indicator.***

Romania has adopted a series of measures to consolidate the competitiveness mechanisms, and the reform concept was based on the idea that the most valuable support offered by the state consists in the creation of the constitutional and legislative frame which will consolidate the role of the competition in the absorption of tensions by rethinking the tax system, thus responding to current demands concerning the role of the state in economy. Thus there were adopted a series of measures concerning the reduction of tax pressure and there was an attempt of including it in the requirements of a modern code of taxation. There were offered a series of fiscal facilities which tried to support the capital, but which materialized in the increase of the profit remained after the economic agents have paid the taxes. Based on the principles practiced by states with market economy, the new system of profit taxation was correlated with the new accounting system and with the mechanism of VAT gathering.

Analyzing in detail the current fiscal system we ascertain that there are still a series of inconsistencies:

- It lacks predictability, the application standards being very often modified;
- It still entails bureaucratic and expensive procedures;

It has an unequal influence on the different social categories;

It contains confusions and vagueness which led as practice experience has shown and will lead to abusive interpretations by fiscal authorities, to disputing the proposed solutions and to contradicting the text of the law;

It reflects the function of maximization of tax income and not the one of being an instrument for stimulating the economic development;

There is no stimulation of engaging people in several activities and especially those requiring high qualification, thus opening the way to fraud and labor without a work record.

*The reduced level of the rate of fiscality in Romania*, under the circumstances where the taxation quotations for the main taxes are similar to those practiced by other states in Eastern Europe (as mentioned in the second chapter of the paper), indicates a weak collection of the fiscal tax bites mainly because the phenomenon of evading the payment of fiscal obligations.

The continuous decrease of the rate of fiscality in Romania, after the year 2000, against the background of the increase, in real terms, of the gross national product and respectively of the decrease of the taxation quotations for the main taxes, can be explained either by the fact that the increase of the taxation base is not enough to compensate for the loss of revenue because of the decrease of taxation quotations, or by the drastic decrease in the rate of fiscal compliance and the expansion of the evading phenomenon.

However, in order to analyze the causes which led to the decrease of tax pressure in Romania, in the following paragraphs we will use the statistic analysis of the correlations established between different variables which influence the rate of fiscality.

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