DETERMINANTS FACTORS OF TAX EVASION IN ROMANIA AND ITALY

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Abstract: *The phenomenon of tax evasion has been investigated in numerous national and global studies aimed at understanding the determinants and its economic implications. The research of tax evasion at national level has mainly emphasized the role of economic factors and less that of non-financial factors (Alm and Torgler, 2006, p. 225). Many studies on the phenomenon of tax evasion have highlighted the importance of non-financial variables. Riahi-Belkaoui (2004, p. 141) points out "the need for a contingency theory of fiscal compliance that will appeal not only to the economic determinants of fiscal compliance, but also to the institutional and moral determinants". Richardson's study (2006, p. 150) examined the tax avoidance factors in 45 countries and concluded "non-financial determinants have the strongest impact on tax evasion" compared to economic variables. Moreover, Richardson (2008, p. 67-78) found evidence that adding non-financial variables to tax evasion models increases its explanatory power. With the help of World Bank's Worldwide Governance Indicators, published on the website http://info.worldbank. org/governance/wgi/, the data for the period 2009 - 2018 for Romania and Italy were analyzed. This study was carried out with the help of non-financial indicators: Corruption control (Coc) and Government effectiveness (GE) and economic indicator Profit tax (PrTx). Based on the hypothesis that, tax evasion exists, the PrTx indicator was used as a dependent variable. THE MAIN PURPOSE: The study tracks the impact of non-financial indicators on tax evasion through the variation of the independent indicators WGI: GE and Coc. THE ASPECTS TO BE TREATED further in the article: With the help of these indicators, was measured the evolution of the PrTx indicator and analyzed over a period of 10 years and a comparison was made between Romania and Italy. To understand the influence of independent variables on tax evasion and the relationship between indicators was it used a linear mixed model. Thus, both a positive and a negative correlation between the variables were identified. Resulting according to the validation of the hypotheses that, non-financial variables have a considerable impact on tax evasion.*
**Keywords:** *Tax evasion, corruption, government effectiveness, profit tax.*

INTRODUCTION

High corruption has a strong social and cultural determination. This negative phenomenon, almost widespread at all levels of the public institution, has led to one of the highest levels in the EU in terms of tax evasion and tax arrears. The literature presents corruption as a determining factor of tax evasion. A study on the corruption perception

index for 2017 shows a failure of most countries in terms of controlling corruption. The study is conducted for 180 states, of which over 60 of them score below 50 points. The world average is 43 points. Compared to previous years, in the vast majority of countries no progress has been made on reducing corruption, as can be seen in figure no.1. This shows the evolution of the IPC (Corruption Perception Index) for Romania and Italy over a period of 7 years, compared to 8 member states of the European Union.

Figure 1 The evolution of the IPC index for Romania and Italy compared to other 8 EU member states in the period 2012 – 2018
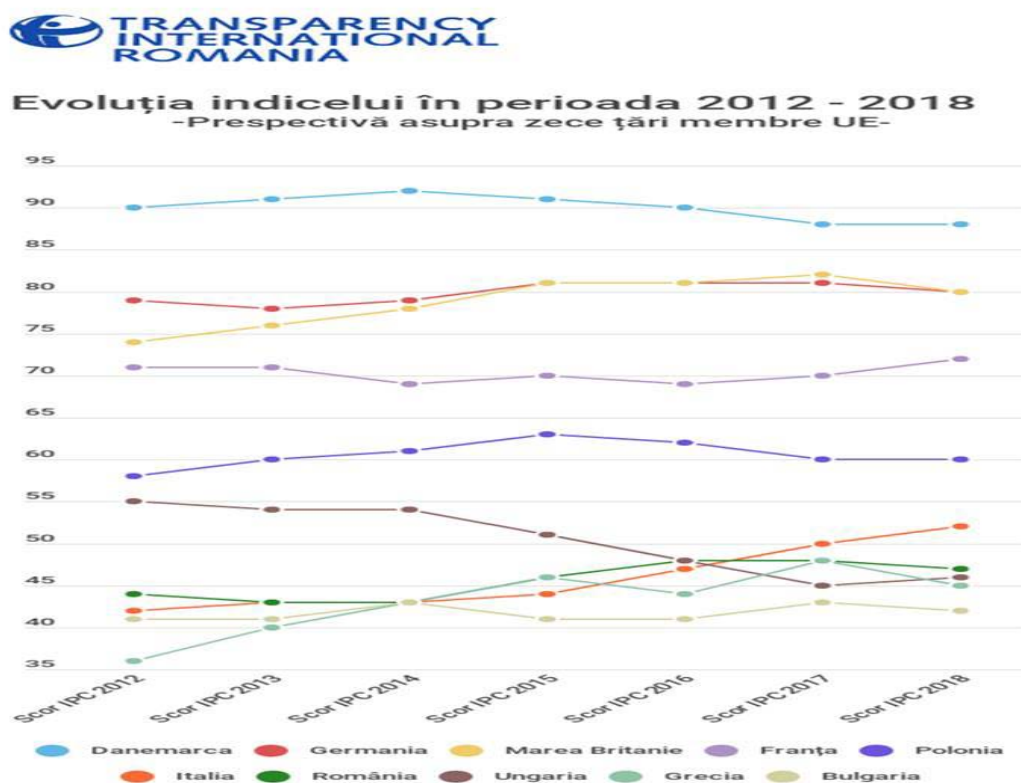
Source: Transparency International Romania

According to figure no. 1 for the period 2012 - 2018, the perception index of corruption for Romania had in 2013 and 2014 the lowest level, respectively 43 points. The percentage shows that during this period the highest level of perception of corruption was registered, and the lowest level was registered in the period 2016 - 2017 with a score of 48 points. In the case of Italy, the corruption perception index had an upward trend, registering the lowest level in 2012 of 41 points and the highest level of perception of corruption in 2018 with 52 points.

DEFINING RESEARCH HYPOTHESES

The Profit Tax

In the structure of the tax revenues in Romania, the income from the profit tax is forecast at a level of 1.7% of the GDP for the period 2017 - 2021, a percentage that can

have a negative or positive impact under the conditions of a stable or unstable government and a level high corruption. According to a study of the "Institute for Economic Forecasting", it is shown that in Romania for 2016, the profit tax represents 6.9% of the "Composition of the revenues to the general consolidated budget" and a share of 2% of the GDP of Romania. Percentage that has a significant threshold in the gross domestic product, which in turn is influenced by the size of the tax rate, that determines an increased tax pressure or not, on the companies. The first research hypothesis regarding the tax on profit is the following:

H1 The tax rate corresponding to the income tax influences the degree of tax evasion.
There is an influence of PrTx on the degree of tax evasion. A higher percentage of taxation is perceived as exerting an increased fiscal pressure on the companies and then they are more prone to evade from to declaration the tax obligations. The studies supported by the World Bank developed by Kaufmann et al. (2011, p.220-246) proved to be some of the most well-known and well-conducted studies on the institutional environment of the countries. The calculated indicators was for 215 countries in year 1996 as part of a long-term project commissioned by the World Bank. The reliability and validity of these indicators were tested by the academic environment and policy makers. Using a statistical analysis will explain the link between tax evasion and the selected indicators.

Government effectiveness
According to the theoretical model of Allingham and Sandmo (1972), the hiding of income depends on the taxpayer's assessment of the expected income. It also depends on the efficient allocation of resources by the government. This reflects the governmental effectiveness, which in turn affects the satisfaction of the taxpayers. It can be argued that GE contributes to formation taxpayers' perception regarding the expected utility of tax liabilities. The second hypothesis is regarding GE and it is as follows:

H2 The higher the government effectiveness (GE), the lower the level of tax evasion.

Corruption control
According to Friedman et al. (p.459-493), "higher corruption and a weaker legal environment are associated with a larger underground economy", respectively an environment in which tax evasion thrives. In Alon and Hageman's study of 5000 companies from 22 former Soviet countries, there was evidence of non-compliance with taxation regulations under a high level of corruption. Thus, it can be argued that the corruption factor can stimulate individuals and companies to evade tax payments, as well as facilitate it through public officials. The more a state is corrupt, the more the confidence of the firms in the legislative power decreases and the desire to evade becomes directly proportional to the degree of perception of the state as being corrupt. The third hypothesis is:
H3 The lower the control of corruption (Coc), the higher the level of tax evasion.

DESCRIPTION OF VARIABLES

Defining the control variable, "PrTx" and the governance indicators "GE" and "Coc".

Profit Tax - represents the value of the tax for the profit obtained by companies in a fiscal year.

Statistical concept and methodology - represents the data that covers the taxes paid by a company. They measure the value of the tax on the obtained profit, for the companies that fits as a taxpayer on profit and have an impact on the declared incomes.

Method: the unweighted average. The total tax rate paid by a company provides a measure of the costs of the taxes it incurs. Taxes are a major source of income for most governments. This source of tax revenues and contributions are determined by fiscal policies and can change the structure of the economy depending on where and how these taxes are placed.

Government effectiveness - this indicator is defined as representing the capture of perceptions regarding the quality of public services, the quality of civil service and its degree of independence from political pressures, to the quality of policy formulation and implementation, and the credibility of the government's commitment against such policies.

Corruption control - refers to perceptions about the extent to which public power is exercised for particular interests. This encompasses both small and large forms of corruption, such as the takeover of power by elites and private interests.

The governance indicators and data for the control variable are published by the World Bank as measures of IEQ (Institutional Environment Quality) and each indicator is between (-2.5) and (+2.5). The size of the underground economy for Romania and Italy, will be measured as an expression of tax evasion, using data for the period from 2009 to 2019.

This study is based on the MIMIC (Multiple Indicators Multiple Causes) model: a macroeconomic measure of the underground economy. The model considers different indicators that directly affect the development of the dimensions of underground economies over time. Schneider and Buehn (2013) argue "there cannot be an exact measure of the size of the underground economy", because estimates can suffer a margin of error of 15% and emphasize the superiority of the MIMIC model, as a measure of the underground economy. Thomas M.A. (2010, pp 31–54) states that an additional sign of the reliability of WGI indicators is that they are frequently used by governments in countries such as the United States when granting grants worth millions of dollars to foreign countries.

The standard error - presents the accuracy of the governance estimates for each country. Lower values indicate more accuracy. The standard errors are related to the confidence intervals reported elsewhere, as follows: a 90% confidence interval is the government estimate +/- the standard error multiplied by 1,645.

The percentage rate (0-100) indicates the country rank of all countries in the world. 0 corresponds to the lowest rank and 100 corresponds to the highest rank.

The number of sources shows the number of individual data sources on which the indicator is based.

Governance score (from -2.5 to +2.5) estimates the governance measured on a scale of about -2.5 to 2.5. Higher values correspond to better governance.

DATA ANALYSIS AND INTERPRETATION OF RESULTS

The linear mixed model, LMM is suggested as an appropriate solution for data modeling, because it facilitates the tracking of variables (such as the size of tax evasion) over time for different variables and countries, without ignoring the effect of other independent variables (Laird & Ware, 1982).   To measure the impact of variables on tax evasion and to track the differences between them, the following general form of the mixed model is proposed:

$$Yt = \beta0 + \beta1 * X1t + \beta2 * X2t + \varepsilon \qquad (1)$$

where: Y- represents the dependent variable;
        PrTx, X1t - represents GE;
        X2t - represents Coc;
        β0, β1,and β2 - represents the coefficient of the model;
        ε - represents the error component from the model.

Descriptive statistics

Table 1 Data on descriptive statistics of tax evasion, variables WGI indicators

Indicator	Country	Year	Number of Sources	Governance (-2.5 to +2.5)	Percentile Rank	Standard Error
Control of Corruption	Italy	2009	9	0,20	64,11	0,17
		2010	11	0,13	61,90	0,17
		2011	12	0,18	63,51	0,16
		2012	12	0,07	60,19	0,15
		2013	11	0,05	59,72	0,15
		2014	10	-0,03	56,25	0,14
		2015	10	0,02	57,69	0,14
		2016	10	0,08	59,62	0,15
		2017	10	0,19	61,54	0,13
		2018	10	0,24	62,02	0,14
Control of Corruption	Romania	2009	14	-0,26	49,76	0,13
		2010	14	-0,23	52,38	0,13
		2011	15	-0,21	52,61	0,13
		2012	15	-0,26	48,82	0,12
		2013	14	-0,19	53,08	0,12
		2014	14	-0,11	53,85	0,12
		2015	14	-0,02	57,21	0,12
		2016	13	-0,02	57,21	0,13
		2017	13	-0,03	55,29	0,12
		2018	13	-0,12	52,40	0,13
Government Effectiveness	Italy	2009	7	0,42	66,51	0,22
		2010	7	0,44	66,99	0,23
		2011	7	0,38	65,88	0,22
		2012	7	0,42	66,35	0,22
		2013	7	0,46	67,30	0,22
		2014	7	0,37	68,27	0,23
		2015	7	0,45	69,23	0,23

		2016	7	0,53	72,12	0,22
		2017	7	0,50	69,71	0,22
		2018	7	0,41	68,27	0,22
Government Effectiveness	Romania	2009	10	-0,36	44,50	0,20
		2010	10	-0,27	45,93	0,20
		2011	10	-0,33	44,08	0,20
		2012	10	-0,31	45,02	0,20
		2013	10	-0,07	51,66	0,20
		2014	10	-0,03	54,81	0,21
		2015	10	-0,06	51,44	0,21
		2016	9	-0,17	47,12	0,20
		2017	9	-0,17	47,12	0,20
		2018	9	-0,25	43,27	0,20

Source: Processing of indicators published by Worldwide Governance Indicators

Table 2 Data regarding descriptive statistics of the tax evasion regarding the control variable PrTx

Country Name	Year	Indicator Name
Italy		Profit tax (% of commercial profits)
	2009	23.2
	2010	23.2
	2011	23.2
	2012	23.2
	2013	20.4
	2014	19.9
	2015	19.5
	2016	17
	2017	23.3
	2018	16.8
Country Name	Year	Indicator Name
Romania		Profit tax (% of commercial profits)
	2009	10.2
	2010	10.5
	2011	10.6
	2012	10.7
	2013	10.7
	2014	10.7
	2015	10.9
	2016	12.3
	2017	12.3
	2018	12.3

Source: Transparency International Romania

Descriptive analysis of data on Profit Tax, Government Effectiveness and Coruption control indicators

Table 3 Descriptive data analysis for PrTx., GE and Coc indicators

|	N		Mean		St. dev.		Min		Max	
	RO	IT	RO	IT	RO	IT	RO	IT	RO	IT
PrTx	10	10	11,120	20,970	0,833	2,626	10,200	16,800	12,300	23,300
GE	10	10	-0,202	0,438	0,119	0,049	-0,360	0,370	-0,030	0,530

Coc	10	10	-0,145	0,113	0,097	0,088	-0,260	-0,030	-0,020	0,240

Source: Own projection

Profit Tax: it can be seen that the average value of corporate PrTx in 2009-2018 is lower in Romania (11,120) compared to Italy (20,970). At the same time, the variation interval of the PrTx in the analyzed period was between 10,200 and 12,300 in the case of Romania, much smaller than in the case of Italy, between 16,800 and 23,300. Government effectiveness: the average value of this indicator in the analyzed period is negative, -0.202 and is much lower than the average for Italy 0.438. The variation range of GE for Romania is between -0.360 and -0.030, and for Italy it is between 0.370 and 0.530. The negative and lower values registered for Romania compared to Italy, indicate a much lower effectiveness of the government in Romania. Corruption control: for this indicator the average value for Romania is negative, -0.145, and the value of the indicator for Italy is a positive one, 0.113. The variation range for Coc is between -0.260 and -0.020 for Romania and between -0.030 and 0.240 for Italy. A much greater variation of this indicator can be observed for Italy, which shows a higher perception of Coc in the analyzed period compared to Romania.
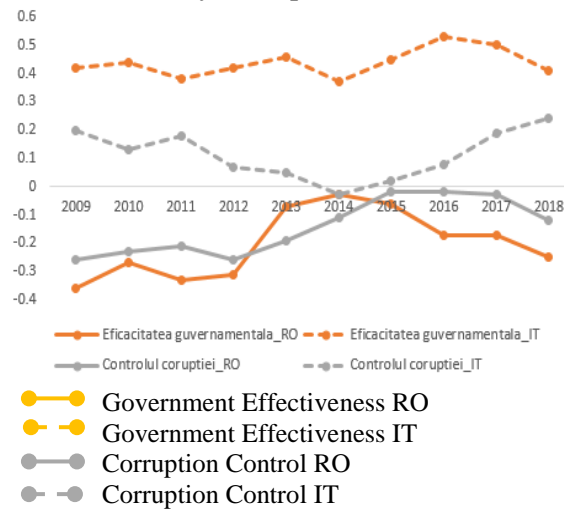
Analysis of Profit Tax, Government Effectiveness and Coruption control indicators.

Figure 2 The evolution of the profit tax in Romania and Italy in the period 2009-2018
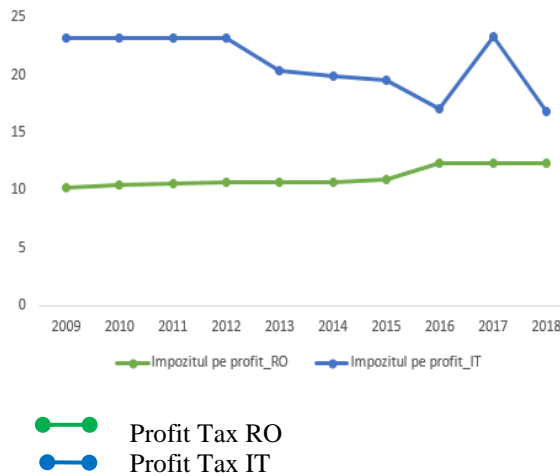
Figure 3 The evolution of government effectiveness and control of corruption in Romania and Italy in the period 2009-2018

Source: Own projection

Interpretation of the Profit Tax indicator for Romania and Italy in the period 2009-2018:

It can be observed that (figure 2); the evolution of the Profit Tax in Romania has a slightly ascending trend in the analyzed period. In the case of Italy, in the period 2009 - 2016 the trend was downward, and in 2017 it presents the highest level in the entire analyzed period. Although the evolutions of the indicator are different, Romania registers lower values than Italy. The values of this indicator for the two countries do not interfere, we can see that the PrTx in Romania is almost half the value of the PrTx in Italy.

Interpretation of the Government Effectiveness and Coruption control indicator for Romania and Italy in the period 2009 - 2018

Government effectiveness - this indicator registers negative values for Romania in the analyzed period, the lowest level is in 2009 with a value of -0.36 and shows a slightly upward trend until 2014 when it registers a maximum value of -0.03. By the end of the analyzed period, the GE indicator decreases to -0.25.

The values of the indicator for Italy remain constant throughout the period, are positive and fall between the values of 0.38 in 2011 and 0.53 in 2016. Regarding the comparison of this indicator for the two countries, Romania has a much lower government effectiveness than Italy, and the values of the indicator do not interfere in the analyzed period.

Corruption control - this indicator keeps negative values for Romania for the whole period. In 2012, it registers a minimum value of -0.26 with an increasing trend until 2015 when it reaches the value of -0.2. The indicator remains constant for 3 years with a value of -0.2 points until 2016 and -0.3 in 2017, followed by a period of decrease in 2018 to -0.12 points. The Coc indicator for Italy shows large variations. If at the beginning of the period, in 2009 it has a maximum value of 0.20 points until 2014 it has a downward trend and reaches a negative value of -0.03 points, year in which it intersects with the value reached by the Coc indicator for Romania (-0.03 points). From 2014 to 2018, the values of the indicator show a constant increase up to 0.24 points. Given that the values of this indicator are negative for Romania, the values show a constant compared to Italy and a tendency to improve on the control of corruption. In Italy there is a sharp decrease between 2009 and 2014, then a steady increase between 2010 and 2018.

ANALYSIS OF CORRELATIONS BETWEEN PROFIT TAX, GOVERNMENT EFFECTIVENESS AND CORUPTION CONTROL VARIABLES

Table 4 Analysis of correlations between PrTx, GE and Coc variables

		RO			IT		
		TxPr	GE	Coc	PrTx	GE	Coc
1. ProfitTax	Coef.	1			1		
	Sig.	-			-		
2. Government effectiveness	Coef.	0,177	1		-0,226	1	
	Sig.	0,624	-		0,529	-	
3. Corruption control	Coef.	0,721	0,653	1	0,187	0,019	1
	Sig.	0,018	0,040	-	0,604	0,958	-

Source: Own projection

Interpretation for Romania: In the case of Romania, it is observed that between the PrTx and the Coc there is a significant link for a risk of 5%, positive (the value of the Pearson correlation coefficient is positive, 0.721) and of medium intensity (the value of the Pearson correlation coefficient is included in range [0.5; 0.75]). At the same time, the correlation analysis shows that there is a weak link (0.177) between the PrTx and the GE, which is statistically insignificant.

Interpretation for Italy: It can be seen that between the PrTx and the Coc there is a significant link for a risk of 5%, positive (the value of the Pearson correlation coefficient is positive, 0.187) and of low intensity, (the value of the Pearson correlation coefficient is included in the range [0; 0.50]). The correlation analysis shows that there is a weak, negative link between the PrTx and the GE (-0,226).

REGRESSION ANALYSIS FOR ROMANIA AND ITALY

- For Romania:

Table 5 Regression analysis for Romania for the variables GE and Coc

Variable	Coefficient	Standard error	t statistical	Sig.	R^2
Constant	11,703	0,360	32,443	0,000	
Government effectiveness	-3,577	1,991	-1,796	0,115	0,671
Corruption control	9,007	2,436	3,696	0,007	

Source: Own projection

R^2- represents the determination ratio, what percentage of the profit tax variation is returned by the corruption control

Regression model equation:

$$\textbf{Profit Tax}_t = 11,703 - 3,577 \cdot \text{Government Effectiveness}_t + 9,007 \cdot \text{Corruption control}_t \quad (2)$$

Since the coefficient for Government Effectiveness is not statistically significant (Sig = 0.115 > α = 0.05), the variable is removed from the model and it becomes:

Table 6 Regression analysis for Romania for the variable Coc

Variable	Coefficient	Standard error	t statistical	Sig.	R^2
Constant	12,011	0,358	33,457	0,000	0,520
Corruption control	6,144	2,084	2,947	0,018	

Source: Own projection

The equation of the final regression model:

$$\text{Profit Tax}_t = 12,011 + 6,144 \cdot \textbf{Corruption control}_t \quad (3)$$

Interpretation of results: The average value of the profit tax in Romania is 12.011% when the Coc is equal to zero. At a one-unit increase in the Coc score, the PrTx increases, on average, by 6.144%. The value of the determination report indicates that 52% of the change in corporate PrTx is explained by the change in Coc.

To validate the estimated regression model between PrTx and Coc, we verified the hypotheses: the non-correlation hypothesis of errors (Breusch-Godfrey Serial Correlation LM Test-Sig = 0.473); the homoscedasticity hypothesis (Heteroskedasticity White Test – Sig = 0.206) and the normality hypothesis (Jarque-Bera - Sig = 0.962). Since each of the 3 his Sig values, is higher than the significance level of 5%, we can validate the regression model.

- For Italy:

Table 7 Regression analysis for Italy for the variables GE and Coc

Variable	Coefficient	Standard error	t statistical	Sig.	R^2
Constant	25,633	8,446	3,034	0,019	0,087

Government effectiveness	-12,116	19,026	-0,636	0,544	
Corruption control	5,696	10,721	0,531	0,611	

Source: Own projection

Since both the coefficient of GE and the coefficient of Coc are not statistically significant (both Sig values are higher than the 5% significance threshold), we can admit that the Profit Tax in Italy <u>is not significantly</u> influenced by GE and Coc.
Following the analysis of the results, the following are presented:

<u>For Romania - having as dependent variable the PrTx indicator</u>, this it registered a maximum value in 2016 - 2018 of 12.3 points and a minimum value in 2009 of 10.2 points. The independent variable the GE of registered in 2016 and 2017, -0.17 points, at half compared to the variation interval of the indicator, and in 2009, -0.36 points, reaching the minimum value. In the period 2016-2018, when the value of the PrTx indicator registered a maximum value of 12.3 points,the value of the GE indicator registered an average value of -0.17 points. And in 2009, when the value of the PrTx indicator registered a minimum value of 10.2 points, the value of the GE indicator also registered a minimum value, respectively of -0.36 points. In conclusion, when the indicator GE is low, registered value of the PrTx is low. When GE increased, the value of Profit Tax reached a maximum. The variable Corruption control had in 2016 the value of -0.02 points when was registered the lowest level of corruption , in 2017 it had the value of -0.03 points and in 2017 the value of -0.12 points.   Conclusion: When in Romania was registered the lowest level of corruption, of -0.02, the value of the PrTx registered a maximum value of 12.3 points. And in when was registered a maximum value of the Coc indicator of -0.26 points, the value of the PrTx was registered by a minimum value of 10.2 points.

<u>For Italy - having as dependent variable the Profit Tax indicator</u>, this it registered a maximum value in 2017 of 23.3 points and a minimum value in 2018 of 16.8 points.

The variable the GE registered in 2017 the value of 0.50 points, close to the max.value of 0.53 points and in 2018 it registered 0.41 points, close to the min.value of 0.38 points. In 2017, when the value of the PrTx indicator registered a max.value of 23.3 points, the value of the GE indicator registered a value close to the max.value, respectively 0.50 points. And in 2018, when the value of the PrTx indicator registered a min.value of 16.8 points, the value of the GE indicator registered a value close to the min., respectively 0.38 points. In conclusion, when the value for the GE indicator decreased, the recorded value of the PrTx indicator decreased. When the recorded value of the GE indicator increased, the recorded value of the PrTx indicator peaked. The variable Coc registered in 2017 the value of 0.19 points, close to the max.value of 0.24 points from 2018. Conclusion: When in Italy was registered an average level of corruption (0.19 points), the value of the PrTx registered a max.value of 23.3 points. And when the Coc registered a max.value of 0.24 points, the value of the PrTx registered a min.value of 16.8 points. The influence of this indicator was lower for Italy compared to the influence of the Coc indicator for Romania.

VALIDATION OF HYPOTHESES AND CONCLUSION

Higher order linear models are incorporated to track all details of changes in tax evasion over time.These models test whether the rate of change in tax evasion has been accelerated or decelerated using several covariance variants of the error term structures. LMM allows treating the interception of linear slopes as fixed or random between countries. Under the random coefficient-modeling framework, the proposed model was progressively constructed with appropriate explanatory variables for different variations. Because the true error structure is usually unknown, a criterion for comparing models with different variations is required. Thus, were followed the variables and their interactions up to the final model. The results obtained from the analysis of the data at the level of the proposed sample lead to the validation of the three research hypotheses. Thus, with the help of the regression analysis of the variables for the two countries, it can be appreciated that there is a significant association between PrTx,GE and Coc on the phenomenon of tax evasion.

We validate the first hypothesis by which the tax rate corresponding to the PrTx influences the degree of tax evasion. The max.value of the PrTx indicator for Romania was registered in the period 2016 - 2018, with a value of 12.3 points. Period in which the GE indicator registered two of the highest values, respectively 0.53 points in 2016 and 0.50 points in 2017. Under the conditions of a good management of fiscal policies, the value of the taxable base on declared and registered revenues of companies has grown.

We validate the second hypothesis, the higher the GE, the lower the level of tax evasion. The best score of the GE indicator for Romania in the analyzed period was obtained in 2014, respectively by -0.03 points. Reported to the dependent variable the PrTx, this registered a value of 10.7 points in 2014, which was increasing compared to the minimum of the analyzed period of 10.2 points.

We validate the third hypothesis, the lower the Coc, the higher the level of tax evasion. Reported to the analyzed period, in 2009 when for Romania was registered for the Coc indicator the lowest percentage of -0.26 points, for the PrTx indicator the lowest value of 10.2 points was registered. Under the conditions of a low Coc, the tax base declared and registered by companies was lower, compared to the value that was registered for the PrTx during the period when a high Coc was registered.

The main limitation of the research is represented by the small number of indicators. In order to increase the number of observations, the extension of the sample with the period 2004-2007 will be considered. We will also consider other factors influencing the non-financial variables.

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