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# IDENTIFYING AND ANALYZING RELEVANT CORRELATIONS BETWEEN THE LEVEL OF TAXATION AND THE EXTENT OF TAX EVASION (QUANTITATIVE ANALYSIS)

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**Abstract**
*Combating tax evasion and corruption has become a priority objective for all specialized bodies, which have developed fiscal policies adapted to the dynamics of these manifestations, aiming to reduce their impact on society by implementing effective measures. In analyzing the relationship between the level of tax evasion and the degree of compliance with taxes and duties by the private sector, the specialized literature highlights the existence of a complex set of factors that influence both taxpayer behavior and the efficiency of the tax system, so the investigative approach had as a starting point the analysis of the share of budgetary losses generated by tax evasion and considered the hypothesis that the size of the underground economy can influence the calculation basis for tax evasion. However, increasing the level of taxation in a context already characterized by a high degree of perception of tax pressure can generate counterproductive effects, determining the intensification of avoidance or evasion behaviors from paying tax obligations. The purpose of the research was to identify and analyze the relevant correlations between the level of taxation and the extent of the phenomenon of tax evasion. The research results support the idea that public decision-makers need to identify a balance between the need to increase budget revenues and maintain a fiscal system perceived as fair and sustainable.*
**Keywords:** *tax evasion; corruption; fiscal pressure.*
**JEL Classification:** H21; H26; H30.

## 1. INTRODUCTION

In analyzing the relationship between the level of tax evasion and the degree of compliance with taxes by the private sector, the specialized literature highlights the existence of a complex set of factors that influence both taxpayer behavior and the efficiency of the tax system.

Numerous empirical studies have investigated the impact that the level of taxation has on the phenomenon of tax evasion, starting from the hypothesis that

changing tax rates could lead to an increase or, on the contrary, a decrease in tax non-compliance behaviors.

However, the results of these studies are often contradictory, suggesting that the relationship between the level of tax revenue collection – expressed as a share of gross domestic product – and the level of tax evasion cannot be explained exclusively by means of tax pressure. In reality, this relationship is much more complex and involves the integrated analysis of economic, institutional, psychological and social factors that influence taxpayers' tax behavior. In this context, identifying effective public policies involves adopting measures capable of contributing to increasing the level of budget revenue collection, without amplifying the tax pressure on taxpayers who correctly fulfill their tax obligations. It is well known that Gross Domestic Product is an essential indicator of a state's economic performance. In this context, Mutașcu et al. (2007) analyzed, at the European Union level, the influence exerted by direct and indirect taxes on GDP during the period 1995-2005. According to the results obtained, a 1% increase in direct taxes leads to a 1.61% increase in GDP per capita, while a similar increase in indirect taxes generates a 0.83% decrease in this indicator. These findings support the idea that a process of fiscal harmonization could be preferable to the practice of fiscal competition between member states.

According to available data, in 2024 the budget revenues of the Romanian state represented approximately 32.6% of GDP. In order to improve this indicator, Romania has several fiscal policy options. A first direction is the increase in taxes and duties. The Romanian tax system was characterized, until recently, by the existence of numerous tax exemptions and exemptions that led to the reduction of the taxable base, as well as by the application of preferential tax regimes for certain economic sectors or categories of taxpayers. At the same time, some tax rates were lower compared to those existing in other European Union member states. Increasing the level of taxation in a context already characterized by a high degree of perception of tax pressure can generate negative effects such as tax evasion.

A second line of action aims to improve the efficiency of tax collection. The structure of tax revenues in Romania is characterized by a significant dependence on indirect taxes and social contributions, which represent approximately 82.6% of total tax revenues – the highest share recorded at the European Union level. In contrast, the average structure of tax revenues at the European level reflects a relatively balanced distribution between direct taxes, indirect taxes and contributions to social security systems, with average shares of approximately 32.3%, 33% and 34.7%, respectively. In this context, reducing the VAT gap is a strategic priority for improving the level of tax revenue collection, given that value added tax is the main source of budget revenues in Romania.

## 2. THEORETICAL CONTEXT ON THE DETERMINANTS OF TAX EVASION

Some authors have argued that one of the central causes of tax evasion is the faulty or incomplete management of records on income, expenses and tax obligations. Although this explanation is valid, there is a lack of in-depth analyses of the motivations that determine contributors to avoid declaring, registering and paying tax debts. In recent specialized literature, the phenomenon of tax evasion is increasingly analyzed from the perspective of institutional and macroeconomic factors that influence the capacity of states to collect tax revenues or the capacity of the state to detect and sanction them.

In the specialized work of the author Richard J. Cebula (1997), the inverse relationship between the level of evasion and the perceived probability of detection is highlighted, namely, the more taxpayers believe that the state has a greater capacity for control, the less tempted they are to avoid paying taxes and duties due. Duncan and Peter (2014), developed this idea, showing that not only the real probability but also the perceived probability of detection matters and emphasizes the role of taxpayers' perceptions, institutional transparency and trust in authorities in determining tax behavior, therefore, the efficiency of control mechanisms and the degree of voluntary compliance are essential factors in delimiting and manifesting different forms of tax evasion.

The classification practically highlights the role of the state's institutional capacity in limiting the phenomenon of tax evasion (control, digitalization, international cooperation).

In a complementary approach, Pluskota (2022) analyzes the determinants of tax revenue collection in Poland and in the member states of the European Union, with the aim of identifying the macroeconomic variables that influence the efficiency of tax systems. The results of the empirical analysis show that, although the impact of factors such as consumption or the level of corruption differs between Poland and other EU Member States, there is a set of economic variables that exert a significant influence on the tax collection process. These include economic growth, trade intensity, consumption level and the degree of institutional corruption. These variables prove to be relevant both for the Polish economy and for the European economies as a whole, suggesting that the efficiency of tax collection is determined not only by the architecture of the tax system, but also by the economic and institutional context in which it operates.

In the studies conducted by Medina and Schneider (2019) and Asllani and Schneider (2022) to quantify the size of the underground economy, they monitored a number of 158 countries over a period of approximately three decades, 1995-2022, using the Multiple Indicators Multiple Causes macroeconomic model, the results being expressed as a percentage of GDP, thus providing a standardized measure that allowed international and temporal comparability.

Thus, the authors listed have defined the underground economy through a series of activities that violate the legal and fiscal system, such as undeclared transactions (monetary/non-monetary operations that would become taxable but would be registered/reported), informal work (employment without legal forms, provision of services that generate income "on the sly", various unauthorized activities), hidden financial circuits (various forms of small-scale savings or storage that are not in the sights of the tax authorities).

James Andreoni et al. (1998), define tax evasion as a phenomenon influenced not only by economic factors, but also by social norms, fiscal morality and psychological factors, arguing that individuals do not act exclusively based on a cost-benefit calculation, but also according to social values and perceptions.

The study conducted by Bătrancea et al. (2017) emphasizes that a citizen's decision to pay taxes is not only economic in this case "fear of fine" but also a psychological one, centered on the following concepts: trust in authorities (if citizens have confidence that the money is used correctly, compliance is voluntary), the power of the authorities (the state's ability to detect and punish evasion, leading to forced compliance) and fiscal education (a high level of fiscal education reduces uncertainty and fear, increasing the desire to pay taxes correctly).

While Tagkalakis et al. (2023) shows that governments that do not comply with strict fiscal rules end up changing taxes "on the fly", destroying that predictability that citizens need. Although the two approach the research from different angles, they reach a similar conclusion, namely that only the quality of the institutions of the statute is essential, thus Bătrancea et al. (2017) says that good institutions increase trust and therefore voluntary payment, and (Tagkalakis et al., 2023) states that good institutions such as Fiscal Councils ensure responsible management of public money.

As a final conclusion, if we were to put the studies undertaken by the two in antithesis, it would be the following: the efficiency of a fiscal system does not depend only on the level of tax rates, but also on a balance between the citizen's perception (Bătrancea et al., 2017) and institutional stability (Tagkalakis et.al., 2023). A fiscal policy that ignores the taxpayer's psychology will fail, no matter how rigorous the macroeconomic rules are, because it will generate resistance and tax evasion.

In the study carried out by Cnossen (2022) he argues that countries with developing economies should adopt simple VAT systems with a broad base, with minimal exemptions that would ensure an increase in income and implicitly their development, while Alognon et al. (2021) following the study concluded that the application of a uniform VAT rate has the potential to generate very large reductions in the VAT deficit.

Overall, the results of this research highlight the fact that reducing tax evasion and improving the level of budget revenue collection depend on the interaction between the institutional framework, economic performance and the efficiency of tax administration mechanisms, therefore, the analysis of the VAT gap and other forms of tax losses becomes essential for the formulation of tax policies capable of strengthening the sustainability of public finances and reducing the size of the underground economy. We must also consider behavioral and institutional factors to understand the mechanisms underlying tax non-compliance.

## 3. RESEARCH METHODOLOGY AND RESULTS

This research is based on a hierarchical approach to the determinants of tax evasion, integrating institutional, fiscal and structural perspectives into a unified analytical framework, respecting institutional factors, represented by the level of corruption, considered fundamental determinants of tax compliance behavior. Starting from the concept that the impact of corruption on tax evasion manifests itself both directly and indirectly, through the efficiency of tax administration, and high levels of corruption erode institutional capacity, reduce collection efficiency and increase tolerance towards evasive behaviors.

To quantify the size of the underground economy in the 27 EU member states and other OECD countries, the study by (Asllani and Medina, 2022) extended to 2023 used the Multiple Indicators Multiple Causes macroeconomic model, concluding that the informal economy began to decline slightly in 2021 and 2022 due to the official economic recovery, after experiencing an increase in 2020 due to the COVID pandemic.

Their research from this period provided essential data for policymakers, highlighting the relationship between the tax burden (high tax rates can push economic agents towards the informal sector), the quality of institutions (how poor governance and corruption fuel the underground economy) and digitalization (the role of electronic payments in reducing tax evasion).

The analysis was based on statistical data provided by Eurostat, regarding the share of tax evasion as a percentage of GDP, the VAT Gap, the inflation rate for 27 European Union member states, for the year 2022, respectively the DESI index according to the European Commission. These data were supplemented with the Corruption Perception Index (CPI), taken from Transparency International reports, as well as the tax level indicator, highlighted by World Bank reports. The purpose of the research was to identify and analyze the relevant correlations between the level of taxation and the extent of the tax evasion phenomenon.

Regarding the justification for the choice of the variables mentioned above:

– Inflation rate: the VAT GAP may temporarily increase through collection gaps as price increases distort the VAT base;

- Level of digitalization: traceability of transactions carried out by companies highlighted through e-Invoice, SAF-T can determine a reduction in the phenomenon of tax evasion, especially the VAT GAP;
- Perceived corruption level: corruption reduces tax compliance, determines a high VAT GAP level;
- Taxation level: high rates stimulate tax evasion, especially the VAT GAP;
- Tax revenues: in the specialized literature, a higher level of tax revenues (% of GDP) is associated in most opinions with a better fiscal capacity and shows the efficiency of the tax administration in collecting taxes and fees.

This research had in mind the following specific objectives:

OS 1. Assessing the impact of institutional integrity, respectively the perception of corruption on the degree of compliance by taxpayers;

OS 2. Analysis of the relationship between the efficiency of collection in this case the VAT GAP and the size of tax evasion;

OS 3. Determination of the role of fiscal pressure, revenues as a percentage of GDP in stimulating the underground economy;

OS 4. Determination of the influence of the digitalization of the economy in combating tax evasion, using the DESI index:

**Table 1. Comparative economic and fiscal indicators**

| Country | Share of tax evasion in relation to GDP % | Average taxation level | Corruption perception index | Tax revenues, % of GDP | GAP TVA | Inflation Rate % |
|---|---|---|---|---|---|---|
| Austria | 3,81 | 53 | 74 | 44,53 | 3 | 5,5 |
| Belgium | 7,42 | 57 | 73 | 44,35 | 6,9 | 5,7 |
| Bulgaria | 8,43 | 27,1 | 42 | 31,4 | 4,9 | 2,9 |
| Czech Republic | 5,31 | 48,52 | 54 | 34,9 | 7 | 6,6 |
| Cyprus | 9,13 | 23,21 | 53 | 35,99 | 8,3 | 4 |
| Croatia | 7,97 | 19 | 47 | 36,15 | 5,7 | 3,5 |
| Denmark | 6,29 | 26,1 | 88 | 48,8 | 5 | 3,1 |
| Estonia | 6,81 | 49,4 | 74 | 34,9 | 1,4 | 12,1 |
| Finland | 5,18 | 40,1 | 88 | 42,93 | 0,4 | 3,5 |
| France | 5,41 | 66,5 | 71 | 47,7 | 4,9 | 2,8 |
| Germany | 4,18 | 48,8 | 80 | 43,88 | 2,8 | 4,9 |
| Greece | 11,31 | 49,9 | 49 | 40,3 | 17,8 | 5,1 |
| Ireland | 2,71 | 25,95 | 74 | 22,54 | 6,7 | 5,5 |
| Italy | 11,48 | 65,41 | 56 | 43,5 | 10,8 | 4,2 |
| Latvia | 7,12 | 35 | 59 | 33,8 | 7,3 | 4,7 |
| Lithuania | 8,39 | 42,7 | 61 | 31,45 | 14,5 | 6,4 |
| Luxembourg | 3,19 | 20,3 | 81 | 38,9 | 2 | 2,4 |
| Malta | 9,51 | 41,8 | 54 | 32,5 | 4,1 | 1,6 |
| Netherlands | 3,35 | 39 | 82 | 38,85 | 4,2 | 2,7 |

| Country | Share of tax evasion in relation to GDP % | Average taxation level | Corruption perception index | Tax revenues, % of GDP | GAP TVA | Inflation Rate % |
|---|---|---|---|---|---|---|
| Poland | 8,28 | 38,8 | 56 | 37,6 | 12,4 | 5,1 |
| Portugal | 6,7 | 42,54 | 62 | 37,45 | 8,7 | 0,5 |
| Romania | 10,27 | 43,8 | 45 | 27,2 | 33 | 5,1 |
| Slovakia | 6,91 | 48,7 | 52 | 35,12 | 5 | 2,7 |
| Slovenia | 6,9 | 32 | 57 | 37,9 | 1,9 | 2 |
| Spain | 5,68 | 58,3 | 61 | 42,93 | 0,8 | 3,1 |
| Sweden | 3,81 | 49,45 | 85 | 44,6 | 4,7 | 2,7 |
| Hungary | 8,32 | 48 | 43 | 33,6 | 4,4 | 5,1 |

Source: author's calculations based on European Commission data

According to the data presented in Table 1, Greece, Italy and Romania are the European Union Member States that record the highest levels of tax evasion.

At a first primary analysis, it can be observed that there is an interdependent relationship between the level of tax evasion and the corruption perception index, thus we can see that the share of tax evasion in GDP is relatively low in states with low CPI values, such as Austria, Denmark, Estonia, the Netherlands, Germany, Sweden and Luxembourg, while in states characterized by high CPI values, there is also a higher share of tax evasion in GDP.

Regarding the relationship between the level of taxation and the CPI index, the results of the study indicate a heterogeneous situation. For example, in states such as Ireland, Luxembourg and Denmark, where the level of taxation is below the European Union average, the CPI index reflects a low level of corruption. At the same time, in states such as Austria, Belgium, the Netherlands and Sweden, despite a level of taxation above the European average, the CPI index also indicates a low degree of corruption. These findings suggest that a high level of taxation does not necessarily imply a high level of corruption, highlighting the need to include in the analysis additional factors that may influence taxpayer behavior.

Romania stands out for its high level of tax evasion (10.27%), associated with the largest VAT gap in the sample (33%), one of the lowest levels of tax revenues as a percentage of GDP (27.2%) and a relatively low corruption perception score (45), these characteristics indicate a combination of inefficiency in collection and institutional vulnerability.

For a correct understanding, we have made the following synthesis after analyzing the data in the table, which results in the following economic relationships:

– Corruption and evasion

Countries with lower scores on the corruption perception index tend to have higher evasion, Romania (45), Bulgaria (42), Hungary (43) →High tax evasion, which suggests a positive relationship between corruption and evasion;

– VAT GAP and tax evasion

An obvious positive relationship is observed, (VAT GAP→tax evasion) countries such as Romania (33→10.27), Greece (17.8→11.31)), Italy (10.8→11.48), which suggests that the VAT GAP is a relevant predictor for evasion;

– Tax revenues (% of GDP)

An inverse relationship can be observed, countries with high tax revenues, such as France, Denmark, Sweden, record low evasion, while countries with low incomes such as Romania and Bulgaria show a high level of tax evasion, which suggests administrative efficiency in developed countries;

– Taxation level

The relationship is not clearly linear, countries such as France (66.5) and Italy (65.41), although they register a high level of taxation, register a low/acceptable percentage of tax evasion, which suggests that it is not the level of taxation itself that matters, but the quality of the institutions.

– Inflation

There is no clear relationship in the estimated model, countries such as Estonia (12.1) register moderate evasion and Portugal (0.5) → medium evasion, which suggests a possible weak or time-dependent effect. Given the current context in which decision-makers, hoping to reduce the budget deficit, have taken several measures, including increasing the VAT rate from 19% to 21%, hoping that higher levels of taxes and fees can ensure more efficient collection, the research will aim to identify critical levers for reducing tax evasion.

In this sense, we tested a multiple regression model that includes institutional factors (corruption, digitalization), fiscal (VAT GAP, tax revenues) and macroeconomic factors (inflation, fiscal pressure) starting from the central hypothesis that institutional integrity and digitalization can have a more pronounced impact on tax compliance than the nominal level of taxes.

The expected signs of the coefficients are, in general:

– higher tax pressure may stimulate evasion;
– a larger VAT gap indicates high levels of evasion;
– high inflation may erode tax compliance;
– digitalization should reduce tax evasion;
– higher tax revenues reflect more efficient collection;

The estimated econometric model has the form:

$$EVFi=\beta0+\beta1IMPi+\beta2INFi+\beta3DESIi+\beta4GAPTVAi+\beta5CORi+\beta6VFi+Ei \quad (1)$$

Where: EVF = tax evasion (% of GDP); IMP = average tax level; INF = inflation rate; DESI = digital economy and society index; GAP TVA = VAT

gap; COR = corruption perception index; VF = tax revenues (% of GDP); Ei = error term.

The estimation was carried out under the classical assumptions of the linear regression model: linearity, independence of errors, homoscedasticity and lack of perfect multicollinearity. We used a cross-section model because the data available for all variables included in the model were not complete for several years for all the analyzed states, under these conditions, we opted for a representative year, which allows for comparative analysis between the member states of the European Union, however I admit that a panel model would have offered more robust results by capturing dynamics over time and controlling for unobserved heterogeneity, allowing the introduction of fixed or random effects capturing the specific characteristics of each economy, but overall the result obtained provides a relevant picture of structural differences between EU states.

At a secondary level, the model integrates direct fiscal determinants, such as the VAT gap and fiscal pressure, which influence taxpayers' economic incentives.

At the same time, the digitalization of the economy is introduced as a variable with an ambivalent effect, being able to both reduce evasion by increasing transparency and facilitate sophisticated forms of tax avoidance in the absence of a robust institutional framework. Furthermore, the model tests the existence of moderation effects, assuming that the impact of digitalization is conditioned by the level of corruption, as well as nonlinear relationships in the case of fiscal pressure, suggesting the possibility of a critical threshold above which incentives for evasion increase rapidly.

Macroeconomic variables, such as inflation or the level of tax rates, are included as control factors, having a secondary role in explaining the phenomenon. The paper proposes an integrated model in which tax evasion is conceptualized not only as a result of economic incentives, but as an emergent phenomenon determined by the interaction between institutional quality, administrative capacity and the digitalization of the economy.

**Table 2. Variables used in the estimated model**

**Variables Entered/Removed[a]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | Venituri fiscale, procent% din PIB, RATA INFLATIEI %, INDICE DESI, Nivel mediu de impozitare, GAP TVA, Indice perceptie coruptie[b] | . | Enter |

a. Dependent Variable: Ponderea evaziunii fiscale în raport cu Pib %

b. All requested variables entered.

Source: author, using SPSS

This table presents the factors that can influence the level of tax evasion, as the purpose of my research is to see to what extent corruption, inflation, digitalization, or the level of taxes can explain why tax evasion increases or decreases in an economy.

**Table 3. Model summary for the regression analysis regarding factors of tax evasion**

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | ,872[a] | ,761 | ,681 | 1,37399 |

a. Predictors: (Constant), Venituri fiscale, procent% din PIB, RATA INFLATIEI %, INDICE DESI, Nivel mediu de impozitare, GAP TVA, Indice perceptie coruptie

Source: author, using SPSS

According to the data highlighted by the Model Summary Table, at first analysis the value recorded by the multiple correlation coefficient R(.872) indicates a very strong and positive correlation, so the closer the value is to 1, the closer the connection between the chosen variables is, but the strongest indicator in this table is undoubtedly the value obtained by the determination coefficient R Square(.761), which means that 76.1% of the variation in tax evasion is explained by the variables introduced, the remaining 23.9% is determined by other factors that were not introduced in this model.

Also, the value obtained by Adjusted R Square is important for the relevance of the model, as the R indicator tends to increase artificially as we add more variables, adjusted R corrects this tendency to provide a more realistic picture, being especially useful when we have a smaller data sample, therefore the model has a real predictive power of 68.1%, which represents a solid score for an economic model. The value recorded by Std.Error of the estimate (standard error of the estimate) -1.37399 can be considered good, it practically represents the average distance at which the real data points are located from the regression line (mathematical model), the smaller this value is, the more accurate the model's predictions are.

**Tabel 4. ANOVA (Analysis of Variance) for regression significance**

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 107,976 | 6 | 17,996 | 9,533 | <,001[b] |
| | Residual | 33,981 | 18 | 1,888 | | |
| | Total | 141,957 | 24 | | | |

a. Dependent Variable: Ponderea evaziunii fiscale în raport cu Pib %

b. Predictors: (Constant), Venituri fiscale, procent% din PIB, RATA INFLATIEI %, INDICE DESI, Nivel mediu de impozitare, GAP TVA, Indice perceptie coruptie

Source: author, using SPSS

From the point of view of the statistical validity of the regression model, the ANOVA (Analysis of Variance) table shows us how much the model explains (if the explanation is real or the result of chance), practically in a research it represents the most critical indicator.

Since the p-value / Sig. is < .001 is below the threshold of.0.05 we reject the null hypothesis, which suggests that the model is statistically significant, respectively there is a probability of less than 0.01 that the observed relationship between the independent variables (corruption, DESI, taxes, inflation, tax revenues) and tax evasion is accidental, therefore we can state with a confidence of over 99% that at least one of the predictors significantly influences the dependent variable. Also the value of 9.533 recorded by the F Test (F ratio) is considerably higher than 1, which suggests that the variation explained by the regression model (Regression Mean Square) is 9.5 greater than the variation due to the error (Residual Nean Square), which confirms the robustness of the proposed model.

In conclusion, the results of the ANOVA test indicate that the multiple linear regression model is valid and statistically significant, the predictive capacity of the set of independent variables on the share of tax evasion is not accidental, the model providing an adequate fit of the analyzed data, and from a research point of view, the empirical result obtained allows us to move on to the next stage, namely the analysis of individual coefficients to identify which of the analyzed predictors has the most pronounced impact.

**Table 5. Coefficients for the regression analysis regarding the determinants of tax evasion**

**Coefficients[a]**

| Model | | Unstandardized Coefficients B | Unstandardized Coefficients Std. Error | Standardized Coefficients Beta | t | Sig. | Collinearity Statistics Tolerance | Collinearity Statistics VIF |
|---|---|---|---|---|---|---|---|---|
| 1 | (Constant) | 2,913 | 3,348 | | ,870 | ,396 | | |
| | Nivel mediu de impozitare | -,016 | ,026 | -,087 | -,609 | ,550 | ,656 | 1,525 |
| | RATA INFLATIEI % | ,228 | ,141 | ,212 | 1,619 | ,123 | ,780 | 1,283 |
| | INDICE DESI | ,140 | ,071 | ,545 | 1,973 | ,064 | ,174 | 5,744 |
| | GAP TVA | ,197 | ,059 | ,554 | 3,312 | ,004 | ,475 | 2,105 |
| | Indice perceptie coruptie | -,211 | ,047 | -1,186 | -4,484 | <,001 | ,190 | 5,263 |
| | Venituri fiscale, procent% din PIB | ,223 | ,069 | ,574 | 3,224 | ,005 | ,420 | 2,383 |

a. Dependent Variable: Ponderea evaziunii fiscale în raport cu Pib %

Source: author, using SPSS

The following equation results from the regression analysis:

$$Y=2.913-0.016X1+0.228X2+0.140X3+0.197X4-0.211X5+0.223X6 \quad (2)$$

Where: Y = Share of tax evasion in GDP (%); X1 = Average tax level; X2 = Inflation rate (%); X3 = DESI index; X4 = VAT GAP; X5 = Corruption perception index; X6 = Tax revenues (% of GDP).

**Table 6. Results of hypothesis testing regarding the factors that determine tax evasion**

Hypothesis structure

| Hypothesis | Theoretical statement | Coefficient (B) | Significance (p) | Result |
|---|---|---|---|---|
| H1 | Reducing corruption leads to decreasing tax evasion | -0,211 | < 0,001 | Confirmed |
| H2 | The increase in the VAT GAP favors tax evasion | 0,197 | .004 | Confirmed |
| H3 | Fiscal pressure (revenues % GDP) directly influences tax evasion | 0,223 | .005 | Confirmed |
| H4 | The level of digitalization (DESI) reduces the evasion phenomenon | 0,140 | .064 | Disabled (Marginal) |
| H5 | Inflation rate is a predictor of tax evasion | -0,063 | .123 | crippled |
| H6 | The average tax rate determines the level of tax evasion | 0,052 | .550 | crippled |

Source: author, using SPSS

Following the research, we can formulate the following conclusions:

- The corruption perception index (p<.001) represents the strongest predictor of the estimated model, the coefficient β=-1.186(negative) indicates that as this index registers increasing values, in this case the country is perceived as less corrupt, tax evasion will decrease significantly;
- The VAT GAP, (p=.004) the predictor has a positive impact, thus an increase in the VAT gap is directly linked to an increase in the phenomenon of tax evasion;
- Tax revenues as a percentage of GDP % (p=.005), represents the surprise in this model, thus a higher share of tax revenues in GDP is associated with higher evasion β=.223, which suggests that the tax pressure is felt to be too high.

Regarding the validity of the model, the results indicate a robust model that highlights a high capacity to explain the variation of the dependent variable, recording a coefficient of determination of $R^2 = 0.761$, however the adjusted coefficient of determination (Adjusted $R^2 = 0.681$), signals a reduction in explanatory power after correcting the number of predictors, which suggests a possible presence of some predictors with marginal contribution (DESI index) or redundant within the model (inflation, tax rates) therefore (VIF) indicates the presence of moderate multicollinearity in the case of the DESI variables and the corruption perception index, although the values do not exceed the critical threshold of 10, these may affect the stability of the coefficients and their individual interpretation.

Overall, the empirical results obtained confirm the relevance of the analyzed macroeconomic and institutional variables (such as tax revenues, inflation rate, DESI index or corruption perception) in explaining the studied phenomenon, but suggest the need to refine the model by eliminating insignificant predictors and testing possible multicollinearity problems, in order to obtain a more statistically robust model.

As we can see, the collinearity tests reveal VIF values ranging from 1.28 to 5.74. The DESI Index and the Corruption Perception Index present values slightly above the conservative threshold of 5, which can be maintained in the model due to their major theoretical relevance for the phenomenon of tax evasion, but in order to eliminate the moderate collinearity of these variables, since the overlap reflects the intrinsic link between administrative digitalization and corruption reduction, I decided to eliminate the DESI Index.

The Beta coefficient of corruption (-1.186) indicates a high sensitivity of the model to this variable, suggesting that institutional integrity remains the strongest explanatory factor, even in the presence of information overlaps with other predictors.

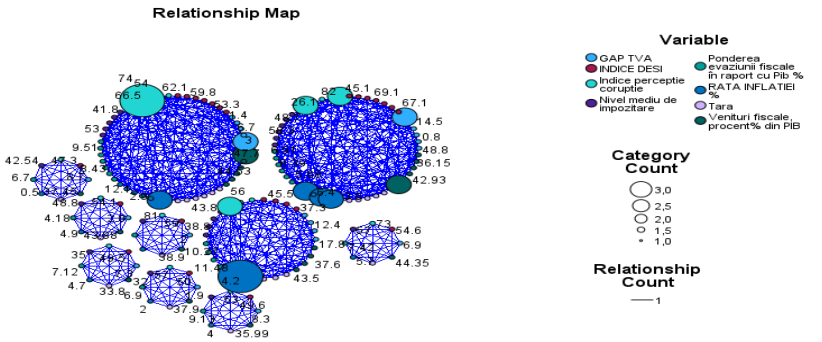
To ensure the validity and robustness of the empirical conclusions, the regression model was subjected to an integrated methodological analysis that combined the visualization of the relationships between variables through the relationship map, the assessment of multicollinearity and the testing of the normality of the distribution of independent variables through the Normal P-P Plot graphs.

Such an approach allows us to understand from a holistic point of view, the determinants of tax evasion and the structural interdependencies between the analyzed factors (economic and structural).

## 3. RELATIONSHIP MAP

In order to obtain a complex visual perspective on how research variables interact with each other, we call upon the relationship map visualization that

complements regression analysis, showing the density of connections in the dataset.




Source: author, using SPSS

**Figure 1. Histrogram - Frecquency distribution of link intensities**

From the visualization of the graphical representation of the relationships between variables according to the Relationship Map, we can observe the complex and interdependent nature of the analyzed phenomenon, which indicates the existence of several distinct groups of observations (clusters), which suggests that the variables tend to organize themselves according to the structure of the data associated with groups of states characterized by similar economic and institutional conditions.

It can be observed that the image representing the Main Cluster, located in the upper left area of the graphical representation, is dominated by the Corruption Perception Index variable, represented by the node of the largest size.

The size of this node practically reflects a high frequency of the corresponding values within the analyzed sample (N=25), which suggests the central role that the indicator occupies in the relational architecture of the model. Its prominent position in the network indicates that the perception of corruption represents a major structural determinant of the investigated phenomenon. and is consistent with the multiple regression results, where that variable is the strongest predictor of the dependent variable, having an estimated coefficient of $\beta=-1.186$.

A second relevant cluster is observed in the upper right area of the map, where a concentration of relationships is noted around the VAT GAP and tax revenue variables. The connections between these variables indicate a high density, which suggests the existence of a strong correlation between them, thus

explaining the relatively high values of the inflation factor (VIF) identified in the analysis of the coefficients of the econometric model.

From the perspective of the structure of interdependencies between variables, the size of the circles (Category Count) indicates a more pronounced representation of these categories in the data set, at the same time, the density and thickness of the connection lines (Relationship Count) express the intensity of the relationships between the variables. Therefore, we can conclude that the presence of a dense network of connections suggests the existence of a complex system of mutual determination between the analyzed indicators, which justifies the use of a multiple regression model to investigate causal relationships.

The graphically illustrated relational structure also provides an explanation for certain statistical characteristics identified within the econometric model. For example, the partial overlap of the networks associated with the DESI Index and tax revenues variables indicates the existence of a structural proximity between them, suggesting a relatively high degree of correlation. This situation explains the higher values of the VIF indicator observed in the multicollinearity analysis, signaling that the respective variables partially share the same connections within the relational network.

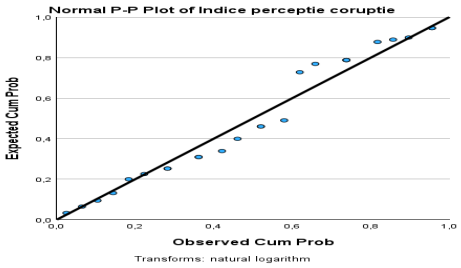
The results of this analysis, carried out in correlation with the analysis of the distribution of the variables illustrated by the P–P Plot graphs, indicate that, following the application of the natural logarithmic transformation, the analyzed variables (VAT Gap), inflation, DESI index and the level of taxation, present a distribution close to normality, which indicates that the density of the relationships observed within the map is not influenced by extreme values or significant deviations from the normality hypothesis.

In conclusion, from the analysis of the relational map, we can say that the investigated phenomenon cannot be interpreted as a simple isolated process, but must be understood as the result of the complex interaction between economic, institutional and structural factors, which act simultaneously in determining the level of tax evasion.

It can also be observed that certain variables, such as the inflation rate, are located at the edge of the network, being represented by smaller nodes compared to the central core, which suggests an insignificant statistical impact on the dependent variable within the model. In addition, the peripheral position of this variable visually confirms the conclusions drawn from the coefficient table, namely, inflation is not a structural determinant of tax evasion, unlike the corruption perception index, which is located at the center of the network and plays a decisive role in explaining tax behavior.

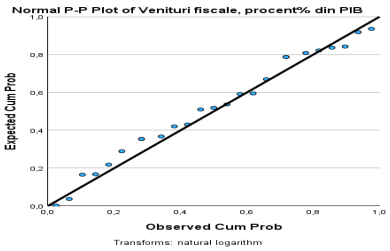
Regarding the justification of the density of connections visualized in the Relationship Map or Spider Web, as it is called in research, the network analysis highlights an extremely dense structure of lines between all variables, which raises the question of whether the data would not be excessively interdependent.

However, this density reflects the complexity of the fiscal phenomenon, in which factors do not operate in isolation, but interact with each other, so although it explains the presence of high values of multicollinearity (VIF > 5 for DESI INDEX and Corruption Perception Index), it legitimizes the use of multiple regression instead of simple correlation analyses. The images below show the normal probability plots (Normal P-P Plot) for the standardized residuals of the regression.



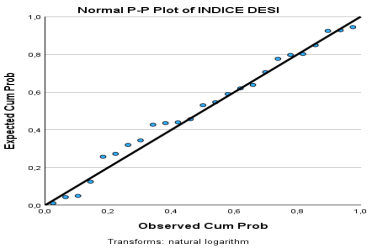

Source: author, using SPSS

**Graph 1. Normal P-P Plot of regression standardized residuals (Model 1)**



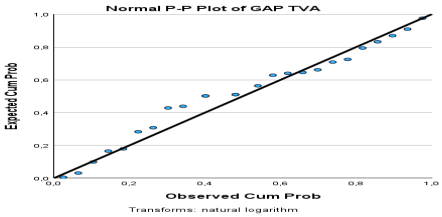

Source: author, using SPSS

**Graph 2. Normal P-P Plot of regression standardized residuals (Model 2)**



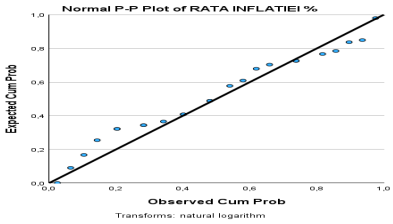

Source: author, using SPSS

**Graph. 3. Normal P-P Plot of regression standardized residuals (Model 3)**



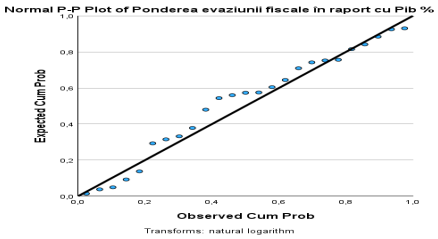

Source: author, using SPSS

**Graph 4. Normal P-P Plot of regression standardized residuals (Model 4)**




Source: author, using SPSS

**Graph 5. Normal P-P Plot of regression standardized residuals (Model 5)**




Source: author, using SPSS

**Graph 6. Normal P-P Plot of regression standardized residuals (Model 6)**

All independent variables were transformed in natural logarithms, the Normal P–P Plot graphs indicate the alignment of points that closely follow the diagonal line, which demonstrates that the residuals (errors) of the model are normally distributed, this confirms that the relationship found between Corruption, VAT Gap and Evasion is mathematically valid and is not the result of a specification error.

In this framework, the model manages to extract the signals specific to each individual variable from a "noise" generated by dense interconnections, providing a robust estimate of the effects of factors on tax evasion. Regarding the justification of the logarithmic transformation through the Normal P–P Plot graphs, the analysis raises the methodological question: How can we be sure that

the complex network of relationships visualized on the map is not influenced by distortions generated by distribution errors? The research conducted led to the formulation of the following answer:

The validity of the structure of the relationships represented on the Relationship Map is confirmed by the analysis of the Normal P–P Plot graphs. These graphs highlight the fact that, after applying the natural logarithmic transformation, the model residuals follow a normal distribution, with the observed points aligning almost perfectly on the theoretical reference diagonal and indicate that the density and connections of the variables on the map are not determined by extreme values or statistical errors, but reflect real relationships and consistent trends within the analyzed data set.

The overlap of the networks between the DESI index and Fiscal Revenues clearly shows why these variables have a high VIF, in this case over 5, which highlights the fact that the two variables "share" the same connections in the relationship map. The central position of corruption reflected by the presence of the node in the largest cluster, explains why this variable emerged as the strongest predictor β=-1.186 in the coefficient table.

## 4. CONCLUSIONS

Regarding the determinants of tax evasion, the results of the quantitative research suggest the following:

- the DESI variable does not contribute independently to explaining tax evasion, its effect being absorbed by institutional variables, especially the corruption perception index whose coefficient remains robust and significant in all specifications, thus confirming the central role of institutional quality in determining tax compliance.
- the VAT GAP variable, the result obtained indicates that tax evasion is directly influenced by the efficiency of tax administration, independently of other macroeconomic factors
- the tax revenue variable, the positive relationship between this variable and tax evasion suggests the existence of a „tax pressure" effect, in which the increase in the tax burden stimulates evasive behaviors.

The comparative analysis of the model indicates that the optimal specification is the one that excludes variables affected by multicollinearity, while maintaining variables with institutional relevance and robust statistical significance, in this context a new (restricted) model offers a more faithful representation of the determinants of tax evasion.

The research also highlighted some surprising results, first of all Tax revenues have a positive impact 0 on evasion, although normally an efficient collection should mean a lower degree of evasion. The result obtained suggests that in the context of the analyzed sample, a high fiscal pressure (expressed by revenues as % of GDP), without a broad tax base and without high institutional

integrity, determines a behavior of taxpayers towards the informal area. We thus obtained an empirical confirmation of the fact that the efficiency of collection (negatively represented by the VAT GAP) is more important than the volume of taxes collected.

Secondly, the research highlighted the fact that tax evasion is not determined by the level of taxes, but rather represents an institutional and structural phenomenon, thus the most eloquent result is the lack of significance of the average level of taxation (p=0.550) in relation to the impact of corruption (p=< 0.001), which demonstrates that fiscal morality and trust in institutions are more important vectors for fiscal compliance.

Thirdly, the research results highlight the vulnerability of collection, thus the direct correlation between the VAT GAP and tax evasion confirms that current tax administration systems present structural niches that allow capital leakage to the informal economy.

## References


1) Alognon, A.D., et al. (2021). The impact of plastic money usage on VAT compliance: Evidence from EU countries. *Hacieda Publica Espanola/Review,* 239(4), pp. 5-26.
2) Andreoni, J., Erard, B., and Feinstein, J. (1998). Tax compliance. *Journal of Economic Literature, 36*(2), pp. 818–860.
3) Batrancea, L., et al. (2017). Understanding tax compliance through the lens of psychology and economics. *Economic Insights – Trends and Challenges, 6(2),* pp.15–21.
4) Cebula, R. J. (1997). Income tax evasion: A critical review of the literature. *Financial Practice and Education, 7*(2), pp. 1–20.
5) Cnossen, S. (2022). Modernizing Value-Added Tax. *Tax by Design for Netherlans Design and administration*. Oxford: Oxford University Press, pp. 441-468.
6) Duncan, R., and Peter, K. (2014). Tax compliance behavior: The role of perception and trust in institutions. *Journal of Accounting and Taxation, 6*(5), pp. 72–83.
7) European Commission Availableat:https://commission.europa.eu/indexro[accessed 22.05.2026] .
8) Medina, L., and Schneider, F. (2019). *Shedding Light on the Shadow Economy: A Global Database and the Interaction with the Official Economy.* World Bank Group.
9) Mutașcu, et al. (2007). Direct and indirect taxes and their influence on GDP in the European Union (1995–2005). *European Economic Journal, 10*(2), pp. 34–52.
10) Pluskota, K. (2022). Determinants of tax revenue collection in Poland and EU countries. *Fiscal Studies Review, 18*(2), pp. 101–122.
11) Schneider, F. and Asllani, A. (2022). Taxing the informal economy in the EU. European Parliament, Policy Department for Economic, Scientific and Quality of Life Policies.
12) Tagkalakis, A., et al. (2023). The effects of fiscal consolidation in OECD countries.*EconomicModelling,* Vol. 118, p. 106099.