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# Tax evasion in Romania as a component of the shadow economy - estimates, analysis and predictions

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## ABSTRACT

*The emergence of the underground economy coincides with the emergence of the state and the imposition of rules, norms and laws, while the evolution of this phenomenon is correlated with the historical stages of state development.*

*However, the proportionality of the underground economy and tax evasion, as an important component, differs from one country to the other, remaining a major issue for both developed and developing countries for fiscal, economic and social reasons. Therefore, combating the underground economy and tax evasion in the present approach has been and is an important political objective in most countries.*

*In this context, each country attempts to control unofficial economic activities through various policy instruments such as education, financial punishment, criminal prosecution or economic growth (Schneider, Buehn, Montenegro, 2010).*

*Actually, it is extremely difficult to obtain accurate information about underground economic activities, the first studies to measure the size of the underground economy were performed in America in the 1950s.*

*The main objective of the paper was to determine the share of tax evasion identified in official GDP, as compared to the unidentified tax evasion, calculated on the basis of the underground economy.*

*In this context, the authors have proposed to analyze aspects of the underground economy and, in particular, tax evasion as a main component of the underground economy, methods of estimating the underground economy, models of estimating the underground economy, especially those based on the cash-deposit ratio, MIMIC p-1-q (Multiple-Indicator-Multiple-Cause) models as well as DYMIMIC method-*

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ology, but also aspects related to data used and their processing, empirical results and discussions.

*The paper ends with empirical results and discussions, conclusions and directions of future research, bibliographical references and annexes.*

**Keywords:** shadow economy, tax evasion, MIMIC-model, DYMIMIC methodology, identified tax evasion, unidentified tax evasion

**JEL Classification:** C10, E26, H26

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## 1. INTRODUCTION

Contrary to the formal economy, whose results are found in the national accounts indicators, the shadow economy represents that part of the economy that is not taxed or monitored by any form of government and produces results that are not included in the Gross Domestic Product (GDP) of the country's economy.

The European Commission (2014, p.1) defines the underground economy as representing economic activities and their corresponding revenues, activities that circumvent or avoid governmental tax regulations in the fiscal field.

In summary, the underground economy, synonymous with the terms of informal economy or hidden economy, represents by cumulation, the following:

- all economic activities that are carried out at the limit of criminal, social or fiscal laws or which escape inventory from the system of national accounts, that is, those activities that regroup in illegal, disguised, fraudulent activities, even from the private sphere (domestic work, volunteering etc.).
- all the organized economic activities violating the social norms and the economic laws in force, with the purpose of obtaining incomes that cannot be controlled by the state.
- a legal economic activity, but deliberately hidden from public authorities to avoid:
  - payment of taxes and duties (corporate tax, VAT, customs duties, etc.);
  - payment of social contributions;
  - compliance with certain statutory minimum wage standards, maximum hours worked, occupational or health protection standards, etc.;
  - performing certain administrative procedures, such as filling in statistical questionnaires or other administrative forms.

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### **Tax evasion- the main subcomponent of the underground economy**

Although the scope of activities that the underground economy can include is particularly large, the main components of the shadow economy are considered to be: *tax fraud, black labor and criminal activities*.

*Tax fraud* is the set of practices that aim not paying all or part of the tax owed to the state.

The Romanian legislation provides in Law 87 of October 18, 1994, to combat tax evasion, at art. 1, the following definition: tax evasion represents the evasion by any means, from the imposition or payment of taxes, contributions and other amounts owed to the state budget, local budgets, state social security budget and special funds by Romanian or foreign individuals or legal entities.

The juridical literature (Şaguna, 2003), considers tax evasion as being the “logical result of defects and inaccuracies of an imperfect legislation, of defective methods of enforcement, and of a failure of the legislator, whose excessive taxation is equally guilty as well as those that it causes to evasion.

Depending on the place where tax fraud happens, intensity, methods used in antithesis with fiscal economic legislation, but also with society’s moral status and tolerance, this practice may take certain forms such as: tax evasion (TE); smuggling; scam; unscheduled or speculative forms, particular interpretations of legal provisions for the purpose of evading or avoiding taxation.

*Tax evasion (TE)* can be defined as the totality of licit or illicit procedures by means of which the interested persons evade, totally or partially, their taxable assets to the obligations established by the fiscal laws (Rădulescu, 2007).

## **2. CURRENT STATE OF KNOWLEDGE IN THE FIELD**

Arthur W. Lewis is the one who initially used the *informal sector* term when he proposed an economic development model.

The generic term of *shadow economy* has a multitude of labels from many researchers who have dealt with the analysis of this part of the economy, otherwise not neglected as encompassing and at the same time as importance, being called an *irregular economy* (Ferman, Ferman, 1973); *shadow economy* (Gutmann, 1977); *shadow economy* (Dilnot, Morris, 1981); *shadow economy* (Simon, Witte, 1980); *informal economy* (McCrohan, Sugrue, 2001) and so on.

Other known expressions used when referring to the shadow economy may include: black market, unofficial economy, gray economy, unnoticed economy, irregular economy, parallel economy, etc.

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Niță, D. et al., (1999) defines the informal economy as totalising the undeclared economic activities of the institutions charged with establishing taxes and social contributions, which are not included in the statistical records and national accounting.

Schneider (2011) shows that the shadow economy includes the production of goods and services that is deliberately hidden for any of the following reasons: a) to avoid paying the income tax, the value added tax and other taxes; b) to avoid paying health insurance contributions, the social security system etc; c) to avoid compliance with certain statutory labor market standards, such as the minimum compulsory wage, the maximum number of working hours, and labor safety standards; d) to avoid compliance with certain administrative procedures, including statistical surveys or other administrative forms.

Dobre, Alexandru (2013) estimated the size of the underground economy in Romania using the cash-based method, and using the Granger and ECM causality tests, they analyzed the impact of the unemployment rate on the Romanian shadow economy. The empirical results revealed the existence of a short-term negative relationship between the unemployment rate and the size of the underground economy and a long-term positive one.

Schneider, F., Raczkowski, K., Mróz, B. (2015) measured the size of the underground economy in 31 European countries (including Turkey, Switzerland and Norway) in 2014 and also estimated the size of the shadow economy for 28 countries of the European Union during the period 2003-2014 (as a percentage of official GDP) using the MIMIC model. As shown by this study, the average size of the underground economy among the 28 EU countries was 22.6% of GDP in 2003, and this ratio fell to 18.6% of GDP in 2014. According to the same study, the largest driving forces of the underground economy in the analyzed countries are unemployment and self-employment, 14.6%, fiscal morality by 14.5% and GDP growth of 14.3%. In addition to these results from the study, the share of tax evasion in GDP for the countries included in the analysis is around 4.2%, which represents about 20% of the size of the underground economy.

### **3. METHODS OF ESTIMATING THE UNDERGROUND ECONOMY**

Although there is no unanimously accepted method for estimating the underground economy's size, estimates have been made over time for different states of the world.

A critical analysis of the main methods for assessing the size of the informal economy was made by Feige (1994), Tanzi (1999), Thomas (1999),

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Feld and Schneider (2010), Schneider and Williams (2013) and Schneider (2014).

The main methods used to estimate the informal economy are:

1. *Direct methods* (micro methods) to obtain the size of the underground economy at a certain point in time (statistical survey) are methods based on the following four tools for investigating the underground economy: questioning the affected agents; random answer method - Martin, Ladoux, Garcia (1982); expert consultation and tax approximation methods;

2. *Indirect methods* (macro methods) that use macro indicators to determine the size of the underground economy over time (statistical survey and tax audit) and which were developed mainly by applying econometric methods: i) indirect monetary methods: Cagan 1958) - liquidity demand method; Gutman (1977) - money-deposits ratio; Feige (1979) - the transaction method; Tanzi (1983) - econometric model; ii) non-monetary indirect methods: the method of gaps (the national accounts gap method, the tax account gap method); labor force method; the method of difference of income and expenditure (Dilnot, Morris, 1981); determinant factors analysis (Frey, Weck-Hannemann, 1983); methods based on electricity consumption - Kaufmann-Kaliberda method and Lacko method (Johnson, Kaufmann, Shleifer, 1997; Lacko, 1999).

3. *Models with latent variables* (models with structural equations) are statistical models that allow consideration of multiple causes as well as multiple effects on the informal economy.

These structural equations models consider the underground economy as a latent variable, correlated on the one hand with a set of observable indicators (reflecting changes in the size of the underground economy), and on the other with a set of observable causal variables, considered being the most important determinants of unreported economic activity (Dell'Anno, 2003).

## 4. MODELS FOR ESTIMATING THE UNDERGROUND ECONOMY

### **Models based on the cash-to-deposit ratio**

This model was conceived and used in estimating the size of the underground economy by Gutmann (1977) and Feige (1979, 1989), having as a basic hypothesis that cash is the main mean of exchange in underground economy transactions.

The model uses the ratio between cash in circulation outside the banking system,  $C_t$ , and sight deposits<sup>1</sup>,  $D_t$  (overnight), as the main tool for highlighting the underground economy.

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1. Considered to have a liquidity similar to cash.

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Gutmann's Model (1977) is based on the following hypotheses:

- ▶ the main causes of the underground economy are high taxes and government regulations;
- ▶ cash in circulation outside the banking system,  $C_t$ , is used exclusively for trading in the underground economy;
- ▶ the ratio of cash in circulation outside the banking system to sight deposits,  $\frac{C_t}{D_t}$ , is influenced only by changes in government fees and regulations;
- ▶ the velocity of money,  $v$ , in both sectors (official and underground) is the same and therefore the size of the underground economy is equal to used extra cash multiplied by  $v$  ( $v_L = v_S = v$ );
- ▶ over time, there has been a moment to start the underground economy.

Excepting changes in government tax rates and regulations, the increases<sup>1</sup> provided by the  $\frac{C_t}{D_t}$  ratio are directly related to the cash used in the underground economy.

#### ***MIMIC Models p-1-q (Multiple-Indicator-Multiple-Cause)***

Such a model was presented for the first time in an article by Loayza (1996), which was built on the statistical theory of non-observed variables and which takes into account multiple causes but also multiple effects on the underground economy compared to previous models which implied a single indicator that quantifies the effects of the underground economy and which presupposed that the rate of taxation is the main cause of the growth of the underground economy.

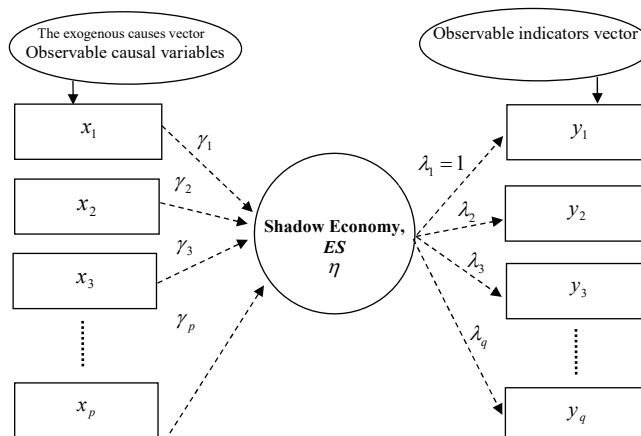
The MIMIC model is a particular case of models with structural equations (Figure 2 shows the diagram of the general model MIMIC p-1-q):

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1. Only some monetary aggregates are used to finance hidden operations: Gutmann relies on a portfolio selection method, while Feige calculates the demand for money.

### The general model MIMIC p-1-q diagram

Figure 1



Source: Schneider (2011) and authors' contribution

The MIMIC model considers the size of the underground economy as a latent variable, on the one hand with a set of observable indicators (reflecting changes in the size of the underground economy), and on the other with a set of observable causal variables considered to be the most important determinants of unreported economic activity (Dell'Anno, 2003).

The MIMIC model is a simultaneous specification of two models: structural and measurement. The identification procedure starts with the extended and continuous model, removing from it those variables that do not have statistically significant parameters.

The basic principle of the model involves comparing the covariance matrix of the sample (observable variables) with a parametric structure imposed on this matrix by a hypothetical model, the latent variable being related to the observable variables within a measurement model. Then, using a structural model, the relations between the observable variables and the latent variable are established.

Applying the MIMIC p-1-q model involves analyzing the connections between the latent variable (the underground economy) and the observable variables, using information provided by the covariance matrix, taking into account multiple causes and multiple indicators.

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## 5. RESULTS AND DISCUSSIONS

### **Data used and their processing**

The data covers the period 1990-2016, the number of observations being 27. The main sources used to collect data were: Eurostat, the National Bank of Romania and the National Institute of Statistics. A description of the variables and their sources are summarized in Table 1 of the Annex.

As a preliminary step, we have performed stationary tests (or unit root tests) for each series. Moreover, Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests were used to identify the level of integration of each variable (Dickey Fuller, 1981).

If the time series (variables) were non-static in their levels, they were integrated to an order that would lead to stationarity. These variables can also be cointegrated, as well as the case where there are one or more linear combinations of variables that are stationary. If these variables are cointegrated, then there is a long-term linear relationship between them. Since it has been determined that the variables examined are integrated by order 1, then the cointegration test can be performed. For this purpose, the Johansen test for cointegration analysis is used in this study.

Considering the non-stationarity of the series and the presence of a common stochastic trend, traditional estimation methods have been excluded, and it is necessary to estimate a VAR model, including an error correction mechanism (ECM).

### **Empirical results and discussions**

Regarding the tax evasion, we considered: i) the estimated tax evasion identified, in terms of: the share of tax evasion in GDP; the share of tax revenues of the consolidated national government budget (GVA), tax evasion identified; ii) estimation of unidentified tax evasion, based on the underground economy, using the DYMIMIC methodology; iii) estimating total tax evasion, using the DYMIMIC methodology, as the sum of identified tax evasion and unidentified tax evasion; iv) the tax evasion perception index in Romania according to World Competitiveness.

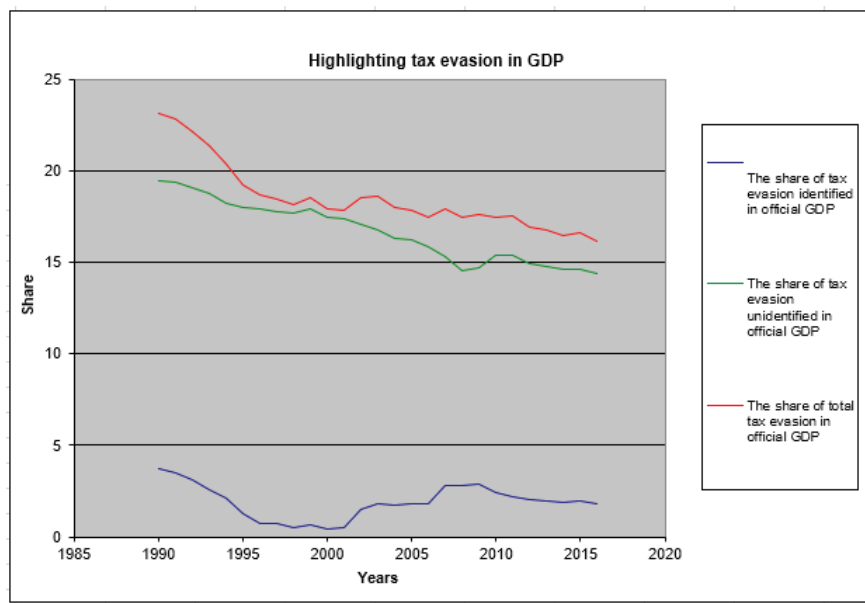
The following figures highlight the numerical aspects obtained:



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**Highlighting the identified / unidentified share of tax evasion  
and on total in official GDP**

*Figure 2*

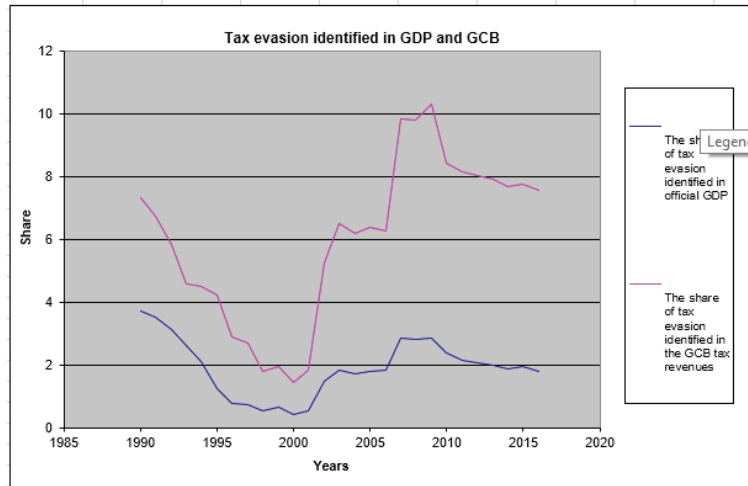


Source: Authors' processings

Thus, the share of tax evasion identified in the official GDP is very small, compared to the unidentified tax evasion, which was calculated based on the underground economy through the DYMIMIC methodology, which makes the share of total tax evasion, calculated by DYMIMIC methodology, as the sum of the identified tax evasion and unidentified tax evasion predominantly based on the unidentified component.

**Highlighting the share of tax evasion identified in GDP and GCB**

*Figure 3*

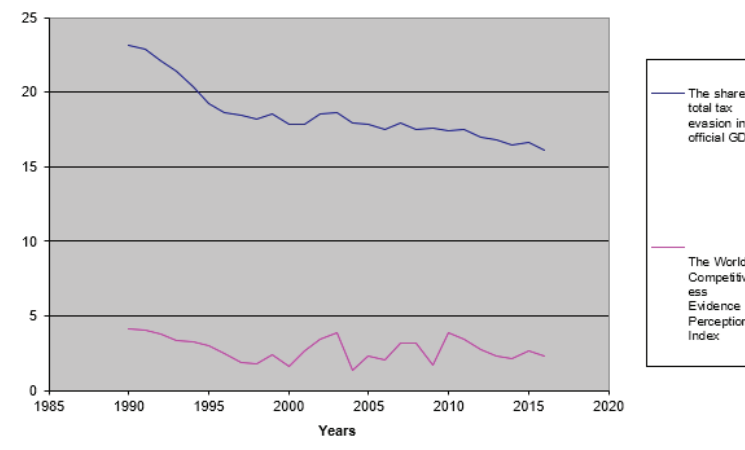


Source: Authors' processings

Thus, the share of tax evasion identified in official GDP is lower than that identified in the GCB, both having a consistent minimum by the year of 2000.

**Highlighting the share of total tax evasion in official GDP and the tax evasion perception index**

*Figure 4*



Source: Authors' processings

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Although calculated according to different methodologies, the share of total tax evasion in the official GDP and the tax evasion perceptions in Romania according to World Competitiveness, have similar trends, the first of them having a slightly wider evolution.

The firm fight against tax evasion can be achieved on two important levels, each level providing major importance (ANAF strategy, 2013, 2017):

- combating the risks of non-compliance, this analysis will be done by implementing a modern risk management system comprising the following steps:
  - identifying risks;
  - making a list of identified risks;
  - prioritizing risks;
  - applying appropriate treatment to reduce / eliminate the risk;
  - performance monitoring;
  - evaluating performance and proposing new measures.
- increasing the effectiveness of ANAF sanctions, through administrative measures, which:
  - lead to a more vigorous application of sanctions for delayed filing or failure to submit tax returns based on extended taxpayer notification possibilities;
  - increase the level of recovery of budgetary obligations resulting from fraud and tax evasion.

## **6. CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH**

The article aims the readers to better understand these specific notions and to know among both specialists and the general public the importance of stopping the tax evasion phenomenon as a major component of the underground economy.

The purpose of the author in this paper was to have a pragmatic and objective work on the tax evasion phenomenon as a main component of the underground economy, alongside black work and criminal activities.

At the same time, the present paper contains conclusions and recommendations on preventing and combating this phenomenon so grazing encountered in the Romanian society.

I am of the opinion that all the elements presented in this paper will provide an overview of this controversial and current topic in Romanian society.

The moral duty of governors and ordinary citizens is to reduce the pace of growth of all tax evasion triggers.

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The models used in the practical part of the paper can be improved in future researches, or by other theorists, and new elements can be added in the analysis, both in form and content.

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**Annex 1.**

**Data on tax evasion at the level of Romania during the period 1990-2017**

**The relative emphasis of tax evasion**

*Table 1*

Year	The share of tax evasion identified in official GDP	The share of tax evasion identified in the GCB tax revenues	The share of tax evasion unidentified in official GDP	The share of total tax evasion in official GDP	The World Competitiveness Evidence Perception Index
1990	3,7	7,32	19,45	23,15	4,12
1991	3,5	6,74	19,35	22,85	4,05
1992	3,1	5,81	19,02	22,12	3,74
1993	2,6	4,56	18,78	21,38	3,36
1994	2,1	4,49	18,24	20,34	3,28
1995	1,23	4,21	18,01	19,24	2,97
1996	0,76	2,87	17,89	18,65	2,45
1997	0,74	2,69	17,73	18,47	1,89
1998	0,52	1,79	17,64	18,16	1,74
1999	0,63	1,96	17,87	18,5	2,41
2000	0,41	1,42	17,47	17,88	1,63
2001	0,52	1,81	17,34	17,86	2,67
2002	1,47	5,23	17,04	18,51	3,44
2003	1,83	6,48	16,77	18,6	3,85
2004	1,72	6,19	16,32	17,96	1,36
2005	1,78	6,37	16,25	17,86	2,27
2006	1,81	6,24	15,86	17,47	2,04
2007	2,83	9,81	15,31	17,9	3,13
2008	2,79	9,78	14,54	17,45	3,21
2009	2,84	10,29	14,66	17,57	1,68
2010	2,39	8,42	15,41	17,44	3,85
2011	2,15	8,13	15,34	17,49	3,45
2012	2,04	8,02	14,89	16,93	2,74
2013	1,98	7,91	14,78	16,76	2,27
2014	1,87	7,68	14,58	16,45	2,11
2015	1,96	7,74	14,62	16,58	2,64
2016	1,77	7,56	14,36	16,13	2,29
2017	1,68	7,34	14,02	15,70	2,11

**Source:** World Competitiveness and authors' processings