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The Social Role of the Supreme Audit Institutions to Reduce Corruption in the European Union - Empirical Study

Ioan Gheorghe TARA¹, Dana Simona GHERAI², Laurentiu DROJ³,
Diana Elisabeta MATICA⁴

Abstract

Corruption is a phenomenon of which appears in all forms of government. Moreover, one can easily say that it occurs in all spheres of society. According to the Global Corruption Barometer from 2013 (a survey in 107 countries to determine how widespread is corruption) one in two persons believes that, in terms of corruption, in the last two years the situation has worsened. But what interests us particularly is that corruption in government's activity leads to: loss of resources, the economic downturn, low quality of life, undermining of the government's credibility and the reduction of its effectiveness. Therefore, taking into account all these aspects, we consider it appropriate for our scientific approach to identify the position that the Supreme Audit Institutions have as far as corruption is concerned. The main objective of our study is to identify the role of the Supreme Audit Institutions in fighting corruption, because the issue of corruption has social features, it is not new and also controversial and up-to-date, thanks to major implications involved. We found that if the Supreme Audit Institution is organized as a Court, the country is more likely to have higher levels of corruption than if opposite.

Keywords: Supreme Audit Institutions, credibility, development, social feature, corruption, accountability.

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Introduction

The global financial crisis has wiped billions of dollars off balance sheets, destroyed the economy and bankrupted companies, however mostly, destroyed confidence in governments and financial systems (Thatchaichawalit, 2010:118). As a result, the financial crisis emphasized stronger the price of indulgence in corruption across Europe, and, while it is caused by a number of factors, which vary from country to country, appears the failure to implement appropriate measures to prevent, detect and sanction of legal and illegal forms of corruption (Kaufmann, 2010). According to Cecilia Malmstrom, EU Commissioner for Home Affairs, about 120 billion euros are lost through corruption every year throughout the 27 EU Member States (Euobserver, 2013).

So, the first aspect that we believe we must clear at the beginning of this study is to *define corruption*, as this is a complex issue. While its roots are found in the social and cultural history of a country, in the political and economic development, in the bureaucratic and political traditions, it can be said that it tends to flourish when institutions are weak and economic policies distort the market. Over time, corruption has been described as a “cancer” that violates the public trust in the state and endangers social cohesion. Corruption involving large sums of money is reported with increasing frequency in both rich countries and in poor countries. But small acts of corruption are reported less, though they can be just as harmful, and, if not controlled, the accumulation of bribe - apparently trivial - can erode the legitimacy of public institutions to the point that even uncorrupted officials and members the public seem to be dishonest (World Bank, 1997b).

The simplest definition treats corruption as *the abuse of public power for personal gain or the benefit of a group*. Klitgaard (1998) developed a simple model to explain the dynamics of corruption, according to which:

$$C (\text{Corruption}) = M (\text{Monopoly Power}) + D(\text{Discretionary Power}) - A (\text{Accountability})$$

Basically, from this point of view, the level of corruption depends on the difference between the aggregate amount of monopoly power and discretionary power exercised by officials and the assumed responsibility. Monopoly power can be high in heavily regulated economies and the discretionary power is often high in developing countries and transition economies where administrative rules and regulations are poorly defined. In terms of accountability, it may be small, as a result of poorly defined ethical standards of public service, weak financial systems and ineffective administrative agencies acting as “watchdogs” (Dye & Stapenhurst, 1998). Weak institutions are part of the necessary conditions for the existence and persistence of corruption (Adit, 2003) as the absence of strong

institutions makes public officials fearless in carrying their supreme authority. So, successful strategies to combat corruption must simultaneously seek to reduce monopoly power (through market-oriented reforms), discretionary power (through administrative reforms) and increase accountability (through the Supreme Audit Institutions). Such mechanisms, when designed as part of a national effort to reduce corruption, are included in *the national integrity system*.

The national integrity system concept was developed and promoted by Transparency International as part of its holistic approach to fight corruption. A national integrity system that works well provides effective safeguards against corruption as part of the fight against abuse of power and embezzlement. It also provides a framework to analyze the strength and efficiency of a country's institutions in preventing and combating corruption. When institutions and mechanisms which make the system work together effectively, as moving parts in a complex machine, they are mutually supportive and enable the anti-corruption system run smoothly (Transparency International, 2012: 7). In this context, taking into account the objective of our study, we consider it necessary to answer the following question: *What is the role of the Supreme Audit Institutions in the context of corruption?* The best way to identify the answer we have considered to be the perspective analysis of the organizations in this domain.

So, according to the World Bank (2001: 1), the Supreme Audit Institutions are certainly an important element in fighting corruption because they are "*useful in the management of public spending, ensuring financial accountability and strength of the public institutions.*" However, Transparency International (2008) does not consider the Supreme Audit Institutions as corruption agencies as a whole, because they are not specifically charged with detecting or investigating corruption, though they are or should be *the pivot of the national integrity system of a country* (World Bank, 1997: 4).

The executive director of the United Nations Convention against Corruption - UNODC, Antonio Maria Costa, has repeatedly stated (United Nation, 2004: 46-55): "*... anti-corruption organizations are watchdogs. As a Supreme Audit Institution, your job is to make sure that public servants take actions and not just make promises on effectively managing public funds. You will ensure that rules of consolidation of the integrity are also applied, for example codes of conduct for the public servants. You will also play an educational role to enhance the dissemination of knowledge about the prevention of corruption and compliance to ethical standards. In order to fulfill your functions effectively and free from undue influence, you need independence, sufficient resources, qualified and training staff. States that are parties to the Convention against corruption have committed to ensure this. You should be "untouchable" so as your integrity and professionalism induce fear into the hearts of corrupt officials* ".

His message has reached the intended purpose, given that many states have tried to diminish existing problems in the system of governance through the creation of Supreme Audit Institutions, which are designed to verify the legality, but also the effectiveness and even the effectiveness behavior towards income and expenditure of the governing bodies. As the agency responsible for auditing the government expenditure and revenue, the Supreme Audit Institution acts as a watchdog over financial integrity and reliability of the information reported. Through its role and functions, it becomes a necessary component of the public sector performance because it increases accountability, adds credibility and provides valuable insights and information to promote transparency and opening in government operations, thereby improving government performance.

Therefore, we can say with confidence that the effective functioning of the Supreme Audit Institutions could have an influence on long-term level: *Government's efficiency* - by monitoring the spending behavior of government bodies and *the perceived level of corruption*— through a greater efficiency of government activity it may be reduced the perceived level of corruption (Blume & Voigt, 2011).

Literature review

The roles of Supreme Audit Institutions in government, corruption determinants or motivations for corruption are discussed in the specific literature, but these are divided in several studies. Research on corruption focuses primarily on business and bribery in the economic and banking (Mauro, 1997; Eberl & Fuhrmann, 2004; Gurgur & Shah, 2005), giving little attention to corruption in public finance (Herbert, 2005). At the same time, the literature on public external audit focuses mainly on the independence, professionalism and revenue of the audit agencies (DeAngelo, 1981; Di Tella & Schargrodsy, 2003) and how these factors affect the reputation and effectiveness of government departments (Raman & Wilson, 1994; Saito McIntosh, 2010).

In terms of empirical studies, researchers focused on analyzing the effects that the Supreme Audit Institution can have in the countries to which they belong, the economic consequences of government audit and the important role it plays in the public sector. Schelker and Eichenberger (2010) indicate the fact that external public audit in Switzerland can improve policy transparency and reduce wasteful spending.

Several studies have explored the effectiveness and efficiency of government audit in China. For example, Wei Qin, & Tang (2010) discuss how the sanctions and penalties transfer of cases, presentation of audit reports within newscasts affect the operational security of public financial funds. Li, Miao, & Liang (2011)

examines the extent to which public external audit by economic accountability can prevent acts of corruption. Liu and Lin (2012) show empirically how public external audit can help reduce corruption, using data from the provinces in China from 1999-2008. The authors analyze the role of government audit in controlling corruption. The results indicate that the number of irregularities found in a province by the external auditing activity is positively associated with the level of corruption in the province, which means that the more severe corruption in a province, much many irregularities were found by the local audit institutions. Also, post-audit rectification effort is negatively associated with the corruption in a province, fact that indicates that a greater effort of rectification is associated with lower corruption.

Blume and Voigt (2011) conducted the first study assessing the economic effects of differences in the organization of Supreme Audit Institutions across country borders. The effects are grouped into three groups of estimated economic variables, namely: *tax policy*, *government's effectiveness and corruption and productivity*. Analyzing in more than 40 countries issues concerning: independence, mandate, implementation of audit recommendations and the organizational model of the Supreme Audit Institution, the authors have shown that they do not have a clear effect on the three groups of dependent variables. There is, however, one exception: the perceived level of corruption is significantly higher if the institution is structured on the model of a Court of Audit.

In the study-book on the economic effects of constitutions, Persson and Tabellini (2003) analyzed the effects of variables: *government's effectiveness*, *corruption perception index and control of corruption* on constitutional institutions.

So, our study can thus be interpreted as a sequel of the two previous studies conducted by Persson and Tabellini (2003) and Blume and Voigt (2011). In the case of the first study mentioned this is true because many constitutions explicitly mention the existence of Supreme Audit Institutions, thus they become constitutional institutions. For the institutions we chose, only one country - France - makes no reference in the Constitution to the Supreme Audit Institution. As regarding the second study, the validity is confirmed by the fact that in the countries considered in our analysis, we find all the forms of audit institutions, and the previous chapters deal extensively with their organizational structure. So, in our case, we rely both on variables used by Blume and Voigt and those used by Persson and Tabellini (2003). Therefore, we set as an objective the analysis of the Supreme Audit Institutions' capacity to bring change on the public government system and to contribute to the perception of corruption. Based on the analyses of our predecessors, through this study we want to answer a series of questions: (1) Can the Supreme Audit Institution, by its characteristics, to help improve government activities and help to increase efficiency? (2) The quality of life of the taxpayers is influenced by the existence of the Supreme Audit Institution and the

corruption? (3) The perceived level of corruption in a country is influenced by the existence of a Supreme Audit Institution?

Answering these questions should enable us to evaluate the extent to which the Supreme Audit Institutions use the power they are conferred for a greater efficiency in the government activities and for the improvement of the quality of life of the taxpayers.

Research methodology and development of hypotheses

In order to achieve the objective, we have passed through several stages that include: (1) Theoretical analysis and development of the research hypotheses; (2) Building the sample and the statistical methods used; (3) Analysis of data collected by using the SPSS 16 statistical tool; (4) Development of the final conclusions of the research. In the process of research, in this study, we used *a combination of qualitative and quantitative methods*. Following qualitative research, through theoretical analysis, we came to the issuance of research hypotheses. Our assumptions reflect *the relationship between analytical variables*, coded by us and analyzed by using the SPSS 16 statistical instrument. To provide a transparent and comprehensive analysis of data presented in our study, we considered it appropriate the development of such research hypothesis, which deals with *the influence of the Supreme Audit Institutions and the perception of corruption in government efficiency*. Then we separating the main objective in secondary objectives, which will further detail the analyzed variables.

The main research hypothesis from which we start is:

H1. The Supreme Audit Institutions increase government's efficiency and reduce the level of perception of corruption

Government's Effectiveness

Undoubtedly, corruption has an impact on public spending and may deter foreign investment (Dobrowolski, 2011 cited in INTOSAI, 2013). This results in a negative impact on the effectiveness and efficiency of government operations. Therefore, to be successful in the fight against corruption is essential to establish an environment that does not favor and not allow the practice of this kind. Governments, which have a major responsibility to create such an environment, should ensure at all levels of government: transparency of policy, finances and legal system, and last, but not least, the responsibility. A greater responsibility may arise where corruption is lower (Persson & Tabellini, 2003: 9).

The statement made by Persson and Tabellini (2003), reminds us to start our analysis from the belief that the responsibility of the Supreme Audit Institutions reflects most of the times on the government activities. According to the National Audit Office in the UK, the institution aims “to audit the accounts of all departments, government agencies and other public bodies and to report to the Parliament on the economy, on efficiency and effectiveness with which they used public money”. Going forward, the NAO website continues: “Our work saves the taxpayer millions of pounds every year.” The truth of these statements may be plausible, given that the state intake in many developed countries is about half of the entire national product.

The role of the NAO can serve as an example for the role of most Supreme Audit Institutions, although mandates, recipients and their final reports differ greatly. So, we can issue our next research hypothesis:

H1.1 The existence of the Supreme Audit Institutions positively influences the efficiency of the government

However, we cannot ignore the results of Blume and Voigt (2011), concerning the relevance of the Supreme Audit Institution in government’s efficiency. According to the authors, all analyzed variables (fiscal policy; government’s effectiveness and corruption; productivity) lead to a similar picture: none proves to have a significant effect on the level of efficiency of the government. The obtained results can be explained by the fact that the government’s activity is very difficult to be assessed, given that we are dealing with public goods, where prices resulted from a competitive process are usually absent. Niskanen (1971: 24-26), in the economic theory of bureaucracy, identified a number of additional reasons to consider the work of government bodies. They refer to: *the monitoring of the bureaucratic behavior* (it is difficult to be done because it is not subject to competitive pressure, which could increase the efficiency of the body) and *the payment system*, leading to increased inefficiency due to the method of remuneration of the public bodies (salaries in the public system usually do not contain incentives to reward innovative and efficient behavior). Thus, Mueller (2003: 363) concludes that “the public body is characterized by weak external control over the efficiency and weak domestic incentives”.

The optimism presented in issuing the research hypothesis H1.1, is justified by the fact that the authors (Blume and Voigt) used in the representation of the Supreme Audit Institutions, the results of the variables developed by the World Bank / OECD in 2003, without updating. Our study brings a first contribution to the specific literature, using the same variables, updated with information contained up to this time (2013).

Perception of corruption

Regarding the level of perception of corruption, it is known that there is no objective way of measuring the degree of corruption present in the economy. If corruption could be measured, it probably could be eliminated. In fact, conceptually, it is not even clear what would be measured. Measuring just bribe would ignore many other acts of corruption that are not accompanied by payment of bribes. An attempt to measure corruption, rather than amounts paid as a bribe, would require more relatively unimportant actions and to identify a piece of data that simply is not true. But, while there are no direct ways to measure corruption, there are several indirect methods to obtain information about its existence in a country or an institution (Tanzi, 1998: 576-577): (1) reports on corruption available from published sources, including newspapers; (2) case-studies of corrupt agencies such as tax authorities, customs and police; (3) questionnaire-type surveys, which can be linked to a specific agency or an entire country. These surveys measure *the perceptions of corruption* rather than corruption itself.

The best known of surveys conducted for this purpose is that of Transparency International, which develops *The Corruption Perception Index* (IPC). The index “measures the perceptions of the degree of corruption as seen by business people, risk analysts and the general public” (Tanzi, 1998:54) and assesses corruption on a scale of 0 to 10. Ten signifies a country without corruption, and zero refers to a country where most transactions or relationships are affected by corruption.

An alternative measure of corruption is based on one of the indicators presented and discussed in the Kaufman *et al* (1999); *Corruption Control* (Kaufman *et al*, 1999) reflects “the extent to which public power is exercised for private gain by small and large forms of corruption as well as the *seizure* of the state by elites and private interests”.

In general, there is a tendency to confuse these indices with actual measurements of corruption. But it is important to keep in mind that indices reflect the perceptions and not objective measures and quantitative real corruption. A good view can be obtained by correlating available indices between them (Tanzi, 1998). As a result, the Supreme Audit Institutions, regarded as observation institutions along with anti-corruption agencies, have attracted growing attention lately, both through the role they play in how to reduce losses and improve the accountability of the government responsibility, and the opportunity to contribute to the fight against corruption (Melo, Pereira, & Figueiredo, 2009). According to the World Bank, the Supreme Audit Institutions are national agencies responsible for auditing government revenue and expenditure, which are designed to review the performance, economy, efficiency and effectiveness of public administration, meaning they oversee the state. Their legal mandates, reporting relationships and effectiveness vary reflecting different systems of government and government policies, but their main purpose is to oversee the management of public funds and

the quality and reliability of financial data reported by the government (World Bank, 2001). By monitoring the functioning of public power, in particular the way, in which resources are used, the activity can strengthen the accountability of government institutions and reduce the abuse of power and resources. Where corruption is a “virus” that harms economic security and social harmony, the Supreme Audit Institutions should be “immunity system” that detects and eliminates the virus (Liu & Lin, 2012: 164).

Therefore, if the responsibility assumed by the Supreme Audit Institutions reflects on the activity of the governments and helps increase efficiency, we can make a step further in our analysis on the assumption that they play an important role in reducing the level of perception of corruption. Which is why, the following research hypothesis is:

H1.2 The existence of the Supreme Audit Institutions negatively affects the level of perception of corruption

Basically, the argument from which we start is that according to which: the more efficient a government is, the more transparent information it discloses to the Supreme Audit Institutions, and thus the perceived level of corruption is lower. Or in other words, the higher the government efficiency, the greater the index of perception of corruption (the level of corruption is lower). To confirm or not this assertion, Figure 1 shows the average government efficiency indicators and the corruption perception index, for 10 years in the European Union states. The data were collected in 2013 for the years 2003-2013.

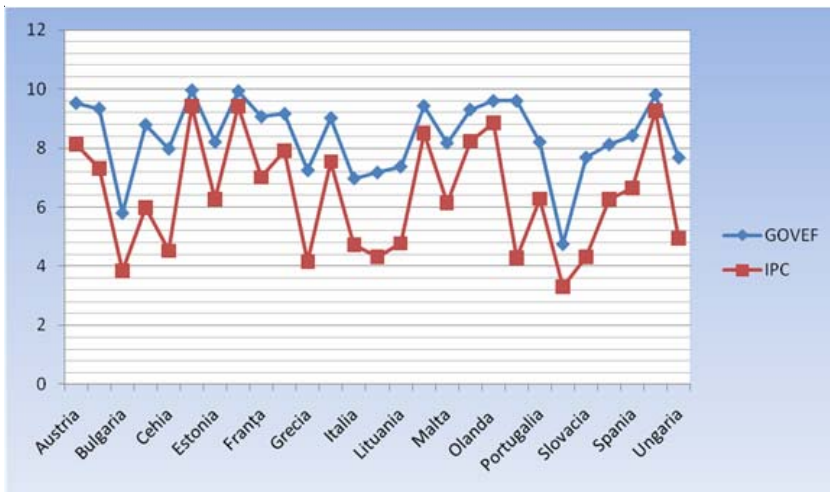


Figure 1. Dynamics of the indicators IPC and GOVEF
 Source: projected by the author

According to our graph, in countries where *government's effectiveness* indicator level is higher, *the index of perception of corruption* is higher. Consequently, our supposition is confirmed, but the final result will be stated after the statistical estimation. Huguette Labelle, chairman of Transparency International, declared when the Corruption Perceptions Index appeared in 2013 that it showed that "all countries are still facing the threat of corruption at all levels of government, from local permits releases to the implementation of laws and regulations". Therefore, we issue the following research hypothesis:

H1.3 The government's efficiency is positively associated with the perception of corruption

Considering the issues presented, it can be considered that an effective functioning of the Supreme Audit Institutions could have long-term consequences on the effectiveness of the government and the perceived levels of corruption. And from this point of view, the authors Blume and Voigt (2011) demonstrated that, by monitoring behavior regarding the government spending by the Supreme Audit Institutions, the level of corruption might be reduced and increase the efficiency of government. Basically, the authors find that while the mandate of the Supreme Audit Institutions contains the audit of the efficiency of governmental bodies, this should be reflected in the general indicators of the efficiency of the government and corruption. More specifically, external auditing activity could make more risky and, therefore, less attractive, the engaging in corrupt behavior of the audited, and thus the perceived level of corruption should be lower.

Building the sample and the used variables

Our study analyzes the European Union member countries, the possible relations between the Supreme Audit Institutions and government efficiency and the perception of corruption. So, we considered 27 of the Supreme Audit Institutions of the European Union countries, given that at the time of writing this paper, Croatia - the last country that joined the EU (01/07/2013) - was not included in our analysis. The reason for excluding Croatia is the lack of access to basic information for our study, in English, without which we cannot achieve the analysis. Data collection caught in our research was manually carried on, for a period of four months (August 2013 - November 2013). Reviewed period is the period of 2002-2011, the annual values. In terms of data management, they were electronically centralized and they were verified both at the time when collecting and when analyzed. For data analysis, we commonly used SPSS 11.0, with a confidence interval of 95%.

Choosing a particular analyzed interval (2002-2011) is based on two reasons, which we considered important: (1) Values of certain indicators considered in our calculation are not available for the period before 2002; (2) The period chosen covers both the years of accession to the European Union of the last 12 countries members, and of the current economic crisis situation, bearing in mind that, according to Robin Hodess (Director of Research in Transparency International) “the European crisis reflects a weak financial management, lack of transparency and poor use of public funds”.

Data on *government’s effectiveness and corruption* were collected from sites specialized in the field: *World Bank and Transparency International*, by country and year. Regarding the activity of the Supreme Audit Institutions, data were collected from each organization’s laws of the Supreme Audit Institution. For missing observations, data were supplemented from other documents found on the websites of the various institutions and studies of globally recognized bodies (OECD / World Bank, 2003; Transparency International, 2012). Other data were collected from *World Bank Open Data*.

Table 1 describes how we selected a sample of observations and its distribution for the period. Original sample included 336 observations, but following the exclusion of Croatia from the analysis and other data, there were 66 missing observations, thus resulting a final sample of 270 observations, distributed completely balanced on the period 2002-2011.

Table 1. Distribution of sample observations

Original Data 28 countries X 12 years = 336										
Panel A – missing data										
Missing data: Countries members of the UE: 1country missing Governing indicators: 2 years missing Index of corruption perception: 1year missing										
Final sample	27countries X 10 years = 270									
PanelB – Distribution of sample by year										
Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Observations	27	27	27	27	27	27	27	27	27	27

Source: projected by the author

Defining variables

For variables that describe the activity of the Supreme Audit Institutions, we use three different data sets.

Governance Indicators for the public sector or Worldwide Governance Indicators -WGI, as they are called, are a group of six indicators calculated the first time in 1996 by Daniel Kaufmann for World Bank. The indicators are (www.info.worldbank.org): Voice and Accountability, Political Stability and Absence of

Violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption and are designed to capture the dimensions of the public governance. Among these indicators, in our study we used:

GOVEF - Government Effectiveness, which defines a group of indicators which measure the perceptions of quality of public service provision, the bureaucracy of a country, the jurisdiction of public servants and their independence from political pressures.

Regarding the activity of the Supreme Audit Institutions, we chose a set of seven variables, taken from three different sources that helped to identify measurable criteria for assessing the value and benefits and opportunities to diminish corruption. For the first two variables (MAND, ARR), the source is the study developed by the World Bank in collaboration with the OECD in 2003 (OECD / World Bank, 2003) about practices of the budgetary procedures. Part of this study treats the public external audit, by 4 variables analyzing the Supreme Audit Institutions from 44 countries (most OECD and Latin American countries, Middle East and North Africa, Africa and Asia). Each variable has 4 or 5 specific questions, which can take values between 0 and 1. Codification and questions for each variable are presented in detail in Appendix 1 to this paper.

Out of the Supreme Audit Institutions presented in our analysis, we identified a number of institutions in the study on 15 OECD / World Bank. The first major contribution of our study to the specific literature is to update the responses to the questions in the variables for the 15 common Supreme Audit Institutions and analyze other institutions in terms of the variables. So, we kept both variables and their coding mode, but we upgraded and found the answers for all the Supreme Audit Institutions included in our study from the current laws and regulations in force. Variables developed by World Bank / OECD (2003) are:

MAND - which is the mandate of the Supreme Audit Institutions. The variable comprises a series of questions, potential complementary, referring to the scope of the mandate of the institution and its codification based on the assumption that bigger is better as far as coverage is concerned. For each option found, the institution received a score of 0.2.

TRAC - is the second variable that refers to another aspect of the mandate: the extent to which the recommendations are implemented. If there is no system for pursuance recommendations, the variable registered the value 0 and if there is a pursuance system one (there are two intermediate options coded 0.33 - if the recommendations are followed internally and 0.67 - where there is a report on the recommendations made).

ARR - represents institutional arrangements to ensure the independence of the Supreme Audit Institutions. In fact, all countries have clear legal basis

on the activities of the Supreme Audit Institutions, but less than half have their independence established their by the Constitution.

SUBJ - is the variable that indicates the selection of audit topics. The questionnaire has again five questions that tick by 0.2, to a maximum of 1.

A second source of variables used for the Supreme Audit Institutions is the survey conducted by INTOSAI through its member organizations, in 60 countries, in the first half of the ‘90. Unlike other studies (Blume & Voigt, 2011), we used in our analysis only the MOD variable, which is a dummy variable that takes the value 1, if the Supreme Audit Institution is at least partially organized through the Court or of the “Napoleonic” type, and 0 otherwise. We chose this variable because the results of our predecessors, Blume & Voigt (2011), that the perceived level of corruption is significantly higher in countries pursuing a model of the Court in their organization. Thus, taking into account their results and the fact that over 30% of the Supreme Audit Institutions in our analysis are organized by the Court pattern, we are interested in the final result.

For a clear picture and understanding of how data collection used in our study was made, we presented some of the variables for Supreme Audit Institutions in the Table 2, as follows:

Table 2. Codification of the variables

Country	World Bank/ OECD				INTOSAI
	MAND	TRAC	ARR	SUBJ	MOD
Austria	0.80	0.67	1.00	0.40	0.00
Belgium	0.60	0.33	0.67	0.40	1.00
Cyprus	0.60	0.00	0.67	0.20	0.00
Czech Republic	0.40	0.00	0.67	0.20	1.00
Romania	0.40	0.33	0.67	0.20	1.00
Hungary	0.80	1.00	1.00	0.20	0.00

Source: projected by the author

The last set of variables used in our study was chosen because, according to Magnus Borge (General Manager of the INTOSAI Development Initiative in 1999) “*the socio-economic environment of the population cannot be ignored when considering the fight against corruption, as social injustice, poverty and violence are often linked to corruption, making it virtually impossible to isolate corruption as a separate issue.*” So, the variables taken into consideration by us and used by our predecessors are:

LYP - which represents the income per capita in each country;

OPEN - measures the total value of imports and exports of each country;

CGEP - measures the central government expenditure as% of GDP.

LYP and CGEP variables were used by Persson and Tabellini (2003) in the study that analyzes the influence of various factors on the constitutional institutions. The premise from which we start is that: *a larger per capita income is the result of a more efficient government and therefore a lower corruption*. At the same time, government spending - very high in the GDP - *represents a lower efficiency and a higher corruption*. And on the variable OPEN, it was used by Liu and Bin (2012), in analyzing the extent to which the Supreme Audit Institutions of China reduce corruption. Basically, it assumes that the more open a country (the value of exports higher than imports) the lower the level of corruption. Therefore, we considered it relevant for our study to use these variables.

Analysis of data collected and research hypotheses testing

Given the theoretical analysis performed up to this point and the studies found in the specific literature, the approach used is simple and direct and it results from the theoretical part. I chose the following econometric model with simultaneous equation:

$$X_i = \alpha_0 + \alpha_1 Y_i + \alpha_2 Z_i + \dots + \alpha_n A_i + u_i \quad (1a)$$

$$Y_i = \alpha_0 + \alpha_1 X_i + \alpha_2 B_i + \dots + \alpha_n C_i + \varepsilon_i \quad (1b)$$

In general, we are interested to explain the evolution of the dependent variables X_i and Y_i , taking into consideration the constant α_0 , the independent variables conventionally used to explain the dependent variables and the random variable u_i , reflecting the influence of the nonessential, unlooked factors. In a particular way, after defining variables, the systems of simultaneous equations from which we started are: For hypothesis: The Supreme Audit Institutions increase government's efficiency and reduce the level of perception of corruption:

$$GOVEF_{it} = \alpha_0 + \alpha_1 IPC + \alpha_2 MAND + \alpha_3 ARR + \alpha_4 MOD + \alpha_5 LYP + \alpha_6 OPEN + \alpha_7 CGEP + u_{it} \quad (1a)$$

$$IPC_{it} = \alpha_0 + \alpha_1 GOVEF + \alpha_2 MAND + \alpha_3 ARR + \alpha_4 MOD + \alpha_5 TRAC + \alpha_6 SUBJ + \alpha_7 LYP + \varepsilon_{it} \quad (1b)$$

In terms of descriptive statistics, Table 3 shows a summary for the variables analyzed in our regression (variables used in both sections).

Table 3. Descriptive statistics of variables

Variable	N	Median	Min	Max	Media	S.D.	C.V
Panel A – Variables concerning the activity of the Supreme Audit Institutions*							
MAND	27	0.60	0.40	0.80	0.56	0.16	0.30
ARR	27	0.67	0.67	1.00	0.80	0.17	0.21
MOD	27	0.00	0.00	1.00	0.33	0.48	1.45
TRAC	27	0.33	0.00	1.00	0.41	0.35	0.86
SUBJ	27	0.20	0.20	0.80	0.24	0.15	0.63
Panel B –other variables comprised in the analysis							
GOVEF	270	85.20	45.10	100	83.82	12.85	0.15
IPC	270	6.40	2.60	9.70	6.38	1.90	0.30
LYP	270	24467	2030	114231.8	28185	19587	0.69
CGEP	270	19.83	6.81	29.78	20.22	3.42	0.17
OPEN	270	-3072	267822	-187335	-3244	55098	-16.98

Source: projected by the author

* The values in panel A are identical during those 10 years so N represents 27 countries, but the total number of observations is 270.

According to the results obtained by determining the indicators of the descriptive variables, a first observation we can make about the homogeneity of data. The coefficient of variation calculated enables us to compare two statistical series in terms of standard deviation. So, one can easily observe that the best group around the mean value is found in the variable ARR and MAND (in terms of Supreme Audit’s institutions). At the opposite pole we find MOD variable. Specific indicators of the MOD variable - which defines how the Supreme Audit Institutions are organized show that most of them are not organized by a Napoleonic model, a situation known to us. According to the results, the way to follow the recommendations issued by the Supreme Audit Institutions is very different and less homogeneous in European Union countries. As far as the other variables taken into account are concerned, homogeneity is greater than the activity of the Supreme Audit Institutions.

Correlations

H1: The Supreme Audit Institutions increase government efficiency and reduce the level of perception of corruption

The results of our predecessors (Blume and Voigt, 2011) suggest that none of the variables developed by the World Bank / OECD for the Supreme Audit Institutions have a significant impact on corruption and government effectiveness. Based on these results, we started the first test hypotheses through graphical representations made between variables useful to identify the type of bonding:

linear connection, exponential, logarithmic, inverse, etc. Figure 2 shows the correlation between government efficiency or corruption perception index and mandate of the Supreme Audit Institutions.

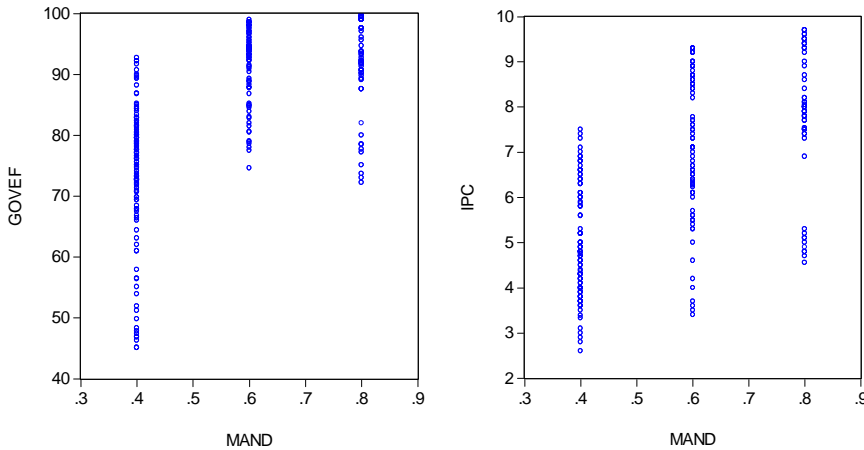


Figure 2. The cloud of points between variable values - MAND and IPC, respectively GOVEF (2002-2011)

Source: projected by the author

The appearance of the point cloud between MAND and GOVEF suggests a direct correlation, linear and possibly of small or medium intensity. Between IPC and MAND variables there is a direct correlation, possible of linear shape and relatively strong. A first observation that can be made is certainly about the mandate of the Supreme Audit Institutions. Although they do not differ significantly from one country to another (its range of variation is rather small), government effectiveness and the corruption perception index register values in a fairly wide range.

So, the Supreme Audit Institutions of two different countries - which have the same mandate - face a corruption perception level or efficiency of government very different. As a result, a first analysis of the chart reminds us to confirm the result of Blume and Voigt (2011), under which the variable (MAND) does not significantly influence the perception of corruption and government effectiveness. Thus, it becomes necessary to identify the impacts and other variables.

We exposed all graphs presenting the point cloud between dependent variables GOVEF, respectively IPC and other independent variables in the systems of multiple equation from which we started. As a first representation, our charts suggest that there is a link between government efficiency (GOVEF) and other variables of the Supreme Audit Institutions: ARR (institutional arrangements) or MOD (manner of organizing).

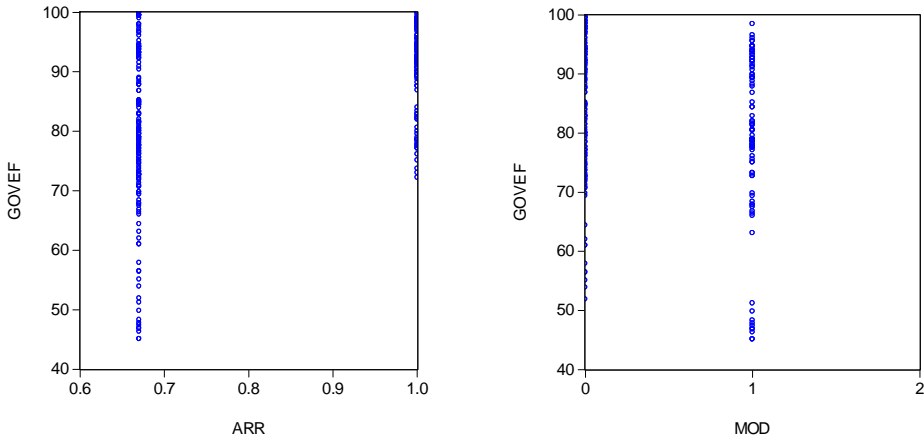


Figure 3. The cloud of points between the values of the variable GOVEF and ARR respectively GOVEF and MOD

Source: projected by the author

The appearance of the point cloud between GOVEF and ARR respectively GOVEF and MOD suggests that there is no correlation between variables, or it is weak. Referring to the corruption perception index, it appears to be significantly influenced by TRAC variable (implementation of recommendations), but the point cloud has not revealed a link between IPC and SUBJ (the selection of audit subjects).

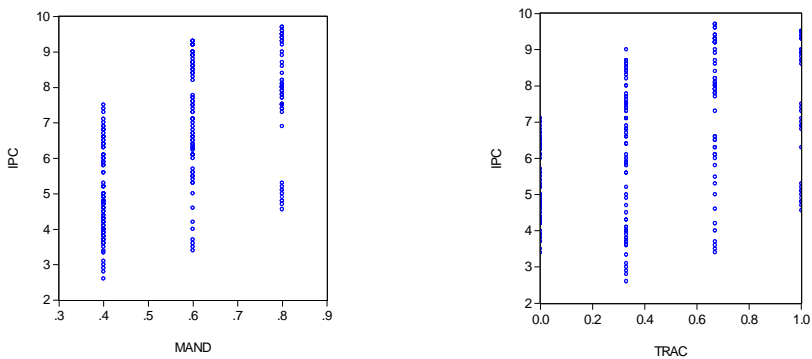


Figure 4. The cloud of points between the values of the variable IPC and MAND respectively IPC and TRAC

Source: projected by the author

The appearance of the point cloud between IPC and MAND respectively IPC and TRAC suggests a direct correlation, relatively strong and linear shape possible.

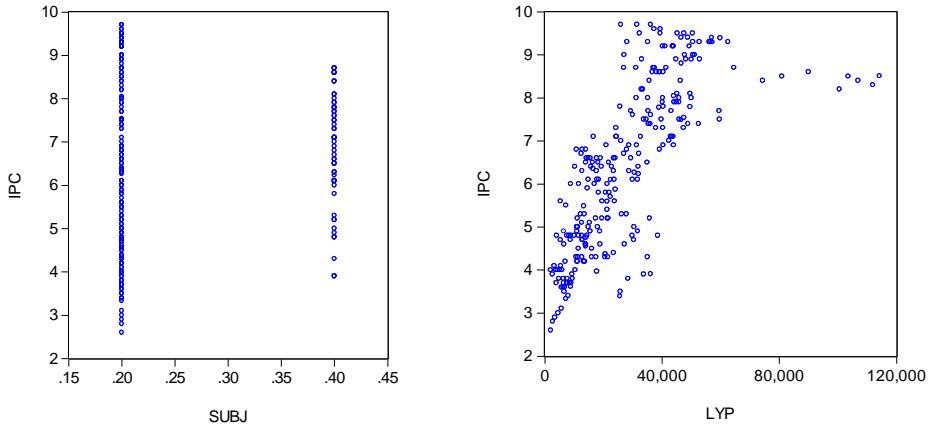


Figure 5. The cloud of points between the values of the variable IPC and SUBJ respectively IPC and LYP

Source: projected by the author

The appearance of the point cloud between IPC and SUBJ suggests that there is no correlation between variables, or is very weak, between IPC and LYP we can say there is a direct correlation, relatively strong and linear or logarithmic. The representations can suggest us a confirmation of previous results in terms of lack of relationship between the variables of the Supreme Audit Institutions and government efficiency, respectively CPI, but we must bear in mind that these correlations are seen individually, without being influenced by other variables taken into account.

Table 4 shows the results of the regression for the simultaneous equations (1a) and (1b). A first effect that can be observed is *the influence of perceived levels of corruption (CPI) in a positive manner on government's efficiency (GOVEF)*. The result is consistent with our research hypothesis *HI.3*, according to which: *government's efficiency is positively associated with the perception of corruption*. Therefore, our hypothesis *is confirmed*. To prove our result, it can be seen the output of the estimation of parameters for the second equation of the model, indicating that the CPI is strongly influenced by GOVEF, in a reversed way.

Table 4. The results of the estimation of the multiple equations system regarding the correlation between perceived corruption and government's effectiveness

Variables	Expected effect of correlation	GOVEF	IPC
Constant			0,045301*
			(0,0000)
IPC	+	19,99472*	
		(0,0000)	
MAND	+/-	16,64371*	0,630902
		(0,0000)	(0,1942)
ARR	+/-	-3,864,592	1,183842*
		(0,2280)	(0,0040)
MOD	+/-	-2,160143**	-0,624979*
		(0,0403)	(0,0000)
LYP	+/+	2,881,105*	1,155122*
		(0,0000)	(0,0000)
OPEN	+	-8,02E-06	
		(0,3260)	
CGEP	?	0,866304*	
		(0,0000)	
GOVEF	-		-10,70707*
			(0,0000)
TRAC	-		0,643820*
			(0,0004)
SUBJ	-		1,642786**
			(0,0187)
N		270	270
R-squared		0,732735	0,817721
Adjusted R-squared		0,726638	0,812851
S.E. of regression		6,717,442	0,822923
Durbin-Watson stat		0,381787	0,416634
Mean dependent var		8,382,111	6,381,863
S.D. dependent var		1,284,798	1,902,242
Sum squared resid		11867,62	1,774,270

Source: projected by the author

Note: values in brackets represent the values of Student statistics

* - Statistically significant for a significance of 1% level

** - Statistically significant for a significance of 5% level

According to theoretical analysis and forecasts made in the previous section, the more a country has a higher efficiency in government activity, the level of perception of corruption is higher (closer to 10), meaning that work is more transparent and there is less corruption. The Supreme Audit Institutions, through their work, may lead to a reverse causality relationship between government work effort and the degree of corruption perceived. On the one hand, there is always a lower efficiency in government operations in a more corrupt place, so that institutions will make more effort to detect inappropriate behavior. On the other hand, the presentation of the results of The Supreme Audit Institutions' work can put pressure on corrupt people and thus may force the audited bodies to improve their work and become efficient in reducing corruption.

The results of the estimation of the model indicate that *the organization of the Supreme Audit Institution (MOD) significantly influences both dependent variables, in a reversed way*. Our result coincides with that of previous studies (Blume & Voigt, 2011) and it seems that if the Supreme Audit Institution is organized as a Court, the country is more likely to have higher levels of corruption than if opposite. Meanwhile, the MOD is significantly negative for the variable of the government efficacy, but only at 10%. Basically, the indicator shows that *the countries whose Supreme Audit Institutions are structured on the model of the Court have a smaller government's efficiency*.

The other variables representative for the Supreme Audit Institutions, as far as GOVEF is concerned are divided as follows: MAND variable influences in a direct manner, while the ARR variable does not have a significant influence. *The broader the Supreme Audit Institutions' mandate in a country, the higher the government's efficiency*, a situation confirmed by our previous theoretical analyzes. Meanwhile, the ARR variable that defines the institution's independence from the executive does not significantly influence the effectiveness of the government. Therefore, *the fact that Institutions' independence is established or not in the Constitution does not affect the contribution they can make to government's efficiency*. Given these results, we can say that our research hypothesis *H1.1: the existences of Supreme Audit Institutions positively influence governments' effectiveness, is confirmed*.

The corruption perception index is significantly influenced positively by variables ARR, TRAC and SUBJ. Therefore, the independence of the Supreme Audit Institutions on the executive, the recommendations and the manner in which the audited part can be determined help to reduce the level of perception of corruption in a country. The results are in line with our expectations, the theoretical analysis carried out and in opposition to the results of Blume and Voigt (2011: 224): "any of the variables based on the World Bank / OECD study does not have a significant impact on the perception of corruption".

The difference in results can be explained by the fact that the sample of countries considered in the two studies are different (our sample is composed of 27 countries and the study of Blume and Voigt analyzes 44 countries) and the variables were re-coded in our study, based on the updated rules, so that final values are different. Therefore research hypothesis *H1.2: the existence of the Supreme Audit Institutions negatively affects the level of perception of corruption, is confirmed.*

As far as the other variables included in the econometric model are concerned, all have a significant influence, except OPEN variable that does not affect the government's efficiency, the opposite result of our expectations. The fact that *in a country the value of exports is greater than the value of imports, does not influence the efficiency of government, which is only affected by per capita income and expenditure in GDP.*

Given our analysis, graphs and results obtained from the calculations, our model of multiple equations becomes:

$$GOVEF_i = \alpha_1 \log IPC_i + \alpha_2 MAND_i + \alpha_3 ARR_i + \alpha_4 MOD_i + \alpha_5 \log(LYP)_i + \alpha_6 OPEN_i + CGEP_i^{\alpha_7} + u_i(1a)$$

$$IPC_i = \alpha_0 + \alpha_1 GOVEF_i + \alpha_2 MAND_i + \alpha_3 ARR_i + \alpha_4 MOD_i + \alpha_5 TRAC_i + \alpha_6 SUBJ_i + \alpha_7 \log LYP + \varepsilon_i(1b)$$

Conclusions

In this study we aimed to bring new elements of knowledge regarding the extent to which the Supreme Audit Institutions, by external auditing activity, succeed to help to reduce corruption in the countries they belong to. Using a sample of data for the period 2002-2011, we built the econometric models of simultaneous equations to examine interactions between the existence and the activity of the Supreme Audit Institutions and the perceived level, respectively the corruption control at regional level. Our research was based on hypotheses, which had as a result the findings presented in *Table 5*, as follows:

Table 5. Results of the empirical research

Nr. of hypothesis	Research hypothesis	Obtained result
H1	The Supreme Audit Institutions increase government efficiency and reduce the level of perception of corruption;	Hypothesis is confirmed
H1.1	The existence of the Supreme Audit Institutions positively influences the efficiency of the government;	Hypothesis is confirmed
H1.2	The existence of the Supreme Audit Institutions negatively affects the level of perception of corruption;	Hypothesis is confirmed
H1.3	The government's efficiency is positively associated with the perception of corruption;	Hypothesis is confirmed

Source: projected by the author

The results of the study indicate that the Supreme Audit Institutions of the European Union contribute significantly to the improved efficiency of government's activity and have a significant influence on the perceived level of corruption in the region. Thus, they can detect deviations and violations of public expenditure and revenue and can detect acts of corruption that may occur, and, at the same time, they can take appropriate decisions to fix these problems. However, not all the suggestions and recommendations proposed in the audit reports are fulfilled and considered likely due to economic circumstances and jurisdiction in which it operates.

At the same time, our analysis confirmed the results of our predecessors Blume and Voigt (2011) according to which the organization of the Supreme Audit Institutions significantly influence the government's efficiency and the perceived level of corruption. Another result obtained by Persson and Tabellini (2003) show that the variables GOVEF (efficiency of government), IPC (corruption perception) significantly influence the constitutional institutions. Given our previous results and that the Supreme Audit Institutions of the European Union are set out in the Constitutions of the countries they belong to, we can say that our study confirms these results of the researchers. The variables GOVEF and IPC are influenced by the existence of the Supreme Audit Institutions.

Consequently, our final results show that the Supreme Audit Institutions' effort to reduce the perceived level of corruption and to take control over them is visible, but it can be most effective where the remedies are carried out properly and correctly perceived by the persons responsible. Meanwhile, with the help of econometric models of simultaneous equations we identified that not all the recommendations made in the audit reports are met, due to economic and jurisdictional circumstances in which they operate. But they contribute to the efficiency of the government's activity and have a significant influence on the perceived level of corruption, they can detect acts of corruption that may occur and can take appropriate decisions to fix these problems. Our main contribution to the specific

literature comes by the accomplishment of the first study that analyzes the reduction of corruption through the external public audit activity, in all the Supreme Audit Institutions of the European Union (except Croatia). However, our research study limits intertwine with its added value. First, appears the issue of representativeness of the sample analyzed for the Supreme Audit Institutions, which is composed only of countries belonging to the European Union. To this end, future research could consider extending the analysis of the sample at least to the Supreme Audit Institutions of the European continent, in order to fully present the activity in an area, or other institutions from several continents, to present comparability. At the same time, we can mention as a shortcoming of our study the small number of variables or factors of influence considered. As a result, a future study could consider increasing the number of variables and assessment methods to obtain relevant information and a more detailed analysis.

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