



**ULBS**

Universitatea "Lucian Blaga" din Sibiu

Interdisciplinary Doctoral School

Doctoral Studies Field: FINANCE

Summary of the doctoral thesis with the  
title:

**POSSIBILITIES OF IMPROVING THE  
MANAGEMENT OF PUBLIC FINANCIAL  
RESOURCES BY CAPITALIZING ON OPEN  
GOVERNMENT DATA AND EXTERNAL  
PUBLIC AUDIT**

PhD. Student:

**CĂTĂLIN FLORIN ZETI**

Scientific Adviser:

**Prof.PhD. MIHAI ARISTOTEL UNGUREANU**



# CONTENTS

<b>INTRODUCTION</b> .....	5
<b>CHAPTER I. PUBLIC SECTOR TRANSFORMATIONS IN THE CONTEXT OF OPEN DATA AND THEIR INFLUENCE ON THE EFFICIENCY OF PUBLIC EXPENDITURE</b> .....	19
1.1. Conceptual approach to open data and their role in streamlining public expenditure .....	20
1.1.1. Conceptual framework on open data .....	20
1.1.2. The role of data openness in increasing the efficiency of public expenditure ....	27
1.2. Highlights of European and national open data policies and legislation .....	35
1.2.1. European open data history .....	35
1.2.2. Open data and open governance in Romania .....	39
1.3. Connecting to European studies conducted in the field of open data and the impact on governance efficiency .....	44
1.3.1. Presentation of the conclusions of some European studies on open data .....	44
1.3.2. Identifying opportunities to streamline governance in the context of open data.....	51
1.4. Conclusions and personal contributions .....	56
<b>CHAPTER II. OPPORTUNITIES FOR CAPITALIZING ON OPEN DATA TO INCREASE GOVERNANCE EFFICIENCY</b> .....	58
2.1. Views on Romania's budgetary performance after joining the European Union .....	58
2.1.1. Aspects of international experience in budgetary policies .....	58
2.1.2. Budgetary performance in the public sector of Romania .....	63
2.1.3. The evolution of the Romanian state budget after EU accession .....	66
2.2. The influence of open data on governance efficiency .....	71
2.2.1. The connection between open data and governance efficiency .....	71

2.2.2. Study on the effect of open data on governance efficiency .....	75
2.3. Conclusions and personal contributions .....	88

**CHAPTER III. THE MANAGEMENT OF PUBLIC FINANCIAL RESOURCES WITHIN THE CURRENT INTERNATIONAL CONTEXT AND THEIR IMPACT ON ECONOMIC GROWTH IN ROMANIA .....** 91

3.1. Considerations on the management of public financial resources, in the current European context .....	91
3.1.1. Economic and legal approach to public financial resources .....	91
3.1.2. Ways of structuring and allocating public financial resources .....	102
3.1.3. Theoretical and practical aspects of public expenditure .....	109
3.2. The impact of public expenditure on economic growth in Romania .....	117
3.2.1. Theoretical and empirical aspects regarding the correlation between the level of public expenditure and economic growth, at international level .....	117
3.2.2. Econometric model for testing the relationship between public expenditure and economic growth in Romania .....	122
3.2.3. Study on the validation of the multiplier effect of investments in the Romanian economy, after the EU accession .....	128
3.3. Conclusions and personal contributions .....	135

**CHAPTER IV. DIGITAL TRANSFORMATION OF EXTERNAL PUBLIC AUDIT AND ITS IMPORTANCE IN STREAMLINING THE MANAGEMENT OF PUBLIC FINANCIAL RESOURCES .....** 138

4.1. The role of external public audit in the management of public financial resources at national and European level .....	138
4.1.1. Theoretical and conceptual aspects of external public audit, at national and European level .....	138
4.1.2. Objectives, procedures and techniques of the external public audit of public finances .....	142
4.1.3. The impact of the external public audit activity on the efficient use of public financial resources in Romania .....	147
4.2. Prospects for the use of open data in the external audit of public finances .....	151
4.2.1. International experience in the digital transformation of auditing .....	151

4.2.2. Advantages and limitations of new research directions in digital auditing .....	158
4.3. Conclusions and personal contributions .....	164
<b>FINAL CONCLUSIONS, PERSONAL CONTRIBUTIONS AND FURTHER DEVELOPMENTS .....</b>	<b>166</b>
<b>SELECTIVE BIBLIOGRAPHY .....</b>	<b>172</b>
<b>LIST OF ABBREVIATIONS.....</b>	<b>181</b>
<b>LIST OF TABLES .....</b>	<b>183</b>
<b>LIST OF FIGURES .....</b>	<b>184</b>
<b>LIST OF GRAPHICS .....</b>	<b>186</b>
<b>LIST OF ANNEXES.....</b>	<b>187</b>
<b>ANNEXES.....</b>	<b>188</b>

**Key words:** public financial resources, public expenditure, open data, open governance, budgetary performance, economic growth, efficiency, external public audit

### **Motivation for choosing the topic, novelty, topicality and importance**

The growing social needs require a proportional increase of financial resources available to states, which is often not accompanied by comparable positive developments of the gross domestic product. Identifying ways to improve the formation, administration and management system of public financial resources is always up to date, due to the dynamics of this system.

Moreover, an axiomatic reality of the world today is the development of information technology in the information age of the Internet, where the electronic data are stored and circulated in the online environment. The need for continuous improvement of the system of the management of state resources and the opportunity of controlled data opening offered by the development of information technology, have led to the development of the concept of open governance which is based on three fundamental principles: transparency of government actions, of decision-making and the government response capability to new ideas and requirements, through collaboration between state institutions and citizens.

An important role in identifying ways to improve the management of state financial resources lies with the external public audit of public finances. This function is ensured, through constitutional and legislative provisions, by the Supreme Audit Institutions (SAI). At national level, the Romanian Court of Accounts fulfills this function, and among its objectives established by law are the efficient and effective formation and management of the state's financial resources. The Court of Auditors is also empowered to elaborate and submit reports in its field of activity, for the competent information of public authorities and the population.

Therefore, the motivation for choosing the topic of the doctoral thesis starts from the current concerns of economists to identify new solutions to increase the efficiency of the use of public financial resources, as well as from the opportunities created by open data viewed as a new resource for creating economic value.

The novelty elements of the doctoral thesis draw on studying the experience of developed countries in the field of data openness, in order to identify viable proposals for

streamlining the management system of national public financial resources, as well as adapting the methods and techniques of external public audit.

The topicality of the research results from the studies conducted at the macroeconomic level, using econometric analysis.

Based on data published by international institutions, we analyzed the correlation between the most significant indicators of governance (government efficiency and corruption control) that are directly influenced by data openness, and an indicator frequently used to describe the state of the national economy, respectively Nominal GDP / capita. This study includes the data available in the World Bank database for 180 countries for 2004, the first year with a wealth of data and 2018, the latest year for which data were published.

The second study assesses the efficiency of Romania's public expenditures, focusing on the relationship between Romania's public expenditures divided into current expenditures and capital expenditures and gross domestic product as an indicator of economic growth, to determine the extent to which each of these categories of expenditures have influenced or not the economic growth. The study was conducted on the basis of statistical data reported for the period 2004 - 2018, covering a period of 15 years which includes the period of economic growth, the period of economic and financial crisis and the post-crisis period. The necessity and importance of the research topic results from the analysis of the research status, which reveals that the specialized literature, mainly foreign, becomes restrictive due to the novelty of the field and the advanced degree of dynamism, which constantly requires a good knowledge of the concerns of the specialists to improve the efficiency of formation and use of budgetary resources. Among the opportunities identified internationally on this regard, those offered by the development of information technology and the effects generated by the openness of data and governments are already echoed in the analysis carried out by specialized bodies in developed countries. Unfortunately, the potential to recover the gap currently registered with developed countries is not fully exploited by Romania, due to the low degree of initiative and resistance to change shown by some public institutions. At the same time, insufficient administrative and human capacity, the level of training in the fields of financing, accessing and implementing European projects or corruption, contribute to this state of affairs. The lack of continuity of the state's structural reforms, in all areas, as well as of medium and long-term programs and strategies, assumed by all policy makers, are recognized causes that have deepened the gaps between Romania and developed EU countries. And, if we admit that the education system, the sanitary system or the transport infrastructure are at a level far below

the expectations of the population, although they have been reformed, designed or redesigned for so many times, we identify another argument for identifying other ways to streamline public finance management, understanding that transparency of government action, accessibility of information, high capacity of governments to respond to new ideas and requirements can only play a positive role. Equally important is the position of the supreme audit institutions in developed countries within the context of new information and communication technology challenges. Understanding the opportunities offered by data openness and the concern for reshaping our own audit procedures and techniques is, beyond a somewhat natural adaptation, a potential methodological reform of public external audit.

### **Placing the research topic within the context of field-related scientific research and within an interdisciplinary context**

The doctoral thesis entitled *“Possibilities of improving the management of public financial resources by capitalizing on open government data and external public audit”* addresses notions of maximum topicality – public financial resources management system, open government data, external public audit of public finances and aims to develop new value judgments about them. This scientific approach has both theoretical and practical utility, if we consider the fact that the management of state financial resources is closely interdependent with the level of development of the private economic sectors and, within the context of globalization, with international economic and trade policies and relations, external public audit focuses on the formation and use of public funds. The complexity of the topic addressed in the doctoral thesis, led us to consult the local and foreign literature in areas such as: finance, economics, public administration, audit, econometrics, IT.

### **Presentation of the current state of the scientific research in the specialized literature**

The theme of the scientific research brings together problems common both to the public environment (central and local public administration, the European Union, national, regional and local government) and to the private environment (international and European financial and audit bodies, private companies, etc.), by addressing the issue of streamlining public finances by capitalizing on the opportunities created by the opening of governments and data, in public audit, with major significance for the transformations of national administration. With reference to previous research focused mainly on the management of financial resources within the context of closed governments and to the adequacy of these

studies with the requirements of the international socio-economic environment, the relevance of the estimated scientific results of this research appears as a natural consequence of the fact that data openness has generated the premises for new approaches, based on transparency of government actions, accessibility to government information in view of public participation in decision making and collaboration between state institutions and citizens. The primary European legislation governing the re-use of open government data is represented by Directive no. 98 of 2003 of the European Commission on the re-use of public sector information, subsequently amended by EU Directive no. 37 of 2013. The main issues are to provide equal treatment for all users of public government information available for re-use and free access to this information for the general public. All open data published by public institutions in digital format may be reused in databases, reports or projects, only on the condition to indicate the source by virtue of copyright and protection of personal data.

The Digital Agenda for Europe, adopted at EU level in 2010, aims to stimulate the European economy by creating sustainable economic and social benefits through a digital single market. The European Commission has created by Decision 2011/833 / EU, the European Union Open Data Portal, which is a true hub for accessing available data published by European public institutions, in order to reuse them free of charge, within databases, projects or reports. On this portal, all European institutions are invited to publish in digital format their own data, of the most diverse types. Thus, geographical, political, financial data, legal documents, environmental, health or transport data can be published.

The increased interest in the provision and use of open data in the external audit of public funds manifested itself in the United Kingdom and the Netherlands, states which have made significant progress in opening up data and governments. In the paper *A new model of external audit, based on the use of open data*, Dascălu D. (2016) promotes the adoption and implementation of this audit model, anticipating based on the performed analysis, the positive impact on the economic and social value obtained from the capitalization of open data. Important bibliographic sources for understanding the changes in the public sector generated by the opening of data are also the works of the authors Goldstein B., Dyson L., Nemani A.(2013), Burall S.; Wilson R. (2009) Howes S.; Bradburn P., (2014), Lebranchu M., (2014), and the web sites: <https://theodi.org>, <http://opendatabarometer.org>, <http://ogp.gov.ro/>, <https://www.europeandataportal.eu>, <http://www.whitehouse.gov/open>, <https://open-data.europa.eu>, <http://www.publishwhatyoufund.org>,

The Changes within the public sector have generated the need for new public



management (NPM), concept that led to the emergence of a wave of reforms within public service management. Increasing the efficiency and effectiveness of public expenditure is one of the key objectives of NPM and to achieve this goal, there have been structural changes within the management of public finances. Among them, the elaboration of budgets on programs, the transition from cash accounting to accrual accounting, the implementation of information systems or the transition from compliance audit to performance audit, were adopted in the national legislation and were implemented within the Romanian public administration.

The constant concerns of economists related to the formation and use of public funds have resulted in a significant number of papers that have addressed this issue. The state of knowledge in this field highlights a significant number of works that address the efficiency, effectiveness and performance of the formation and use of public financial resources, the works of the following authors are worth mentioning: Afonso A., Allen R., Anghelache G., Balteş N., Belean P., Boboc I., Dobrotă C., Diamond J., Guthrie J., Herciu M., Humphrey C., Leon Ghe. N., Mandl U., Mihaiu D., Mureşan V., Olson O., Oprean C., Osborne D., Pollitt Ch., Profiroiu M., Robinson M., Schick A., Schuknecht L., Tanzi V., Ungureanu M. A., Văcărel I., Woods M., and others.

Aspects related to the analysis on the evolution of the budgetary resources of the European Union in the last 20 years were approached by the author Giacomo Benedetto in the paper "Institutions and the route to reform of the European Union's budget revenue, 1970–2017" (*Empirica*, 2017, 44: 615). Furthermore, the authors Clemens F., Heinemann F. and Ungerer M., in the work "Reforming the financing of the European Union: a proposal" (*Intereconomics* 50.5, 2015, 288-293) and the authors Heinemann F., Mohl Ph., and Osterloh S., in the work "Reforming the EU Budget: Reconciling Needs with Political-Economic Constraints." (*European Integration* 32.1, 2010, 59-76), present their options for reforming the European Union budget.

To ensure a complete decision-making framework and competent information to the international bodies that Romania has joined as well as to the general public, the certification of financial and accounting information becomes an indispensable condition for the credibility of this information and of the issuing institutions. This role belongs to the public audit concerned with the formation and use of the financial resources of the states. The European Commission has launched a broad consultation process between Member States on the role of public audit within the current economic climate, the independence of auditors, the relevance

of the information presented in the audit reports or issues related to corporate governance.

Among the specialized works dedicated to public audit, we appreciate that the works of specialists such as Stacey N.A.H.(1954), Brown R.(1968), Littleton A.(1981), (Porter, 2009), (Humphrey și alții, 2009), (Fowzia, 2010), Horomnea (2010) or Dobroțeanu and others (2011) are of great reference.

From the research of the specific regulations, we notice that the Supreme Audit Institutions have formed their own professional training bodies that are to research and implement efficient external audit practices in the field of formation and use of public funds. Thus, the “umbrella” organization at the international level in terms of control and external audit of public finances is the International Organization of Supreme Audit Institutions. (INTOSAI), founded in 1953 including 189 permanent members and 3 associate members at regional level, such as the European Organization of Supreme Audit Institutions (EUROSAI). Starting from the recommendations of the European Union for Romania's integration among Member States, the Court of Accounts has developed its own audit standards, based on the models of the INTOSAI, IFAC standards, the European guidelines for their implementation, as well as the standards of other audit institutions.

### **Research objectives**

The doctoral thesis entitled “ *Possibilities of improving the management of public financial resources by capitalizing on open government data and external public audit*” aims at identifying ways to increase the efficiency of financial resource management, by assessing the impact that open data can have, by implementing new methods and techniques of public audit and capitalizing on the experience of advanced states. In order to achieve the main objective, the following secondary objectives were pursued:

- ✓ systematization of conceptual approaches regarding the data opening process, in order to streamline public expenditures;
- ✓ synthetic presentation of European and national policies and legislation in the field of open data;
- ✓ connection to European studies conducted in the field of open data and the impact on government efficiency;
- ✓ evaluation of Romania's budgetary performance after joining the European Union;
- ✓ study regarding the influence of data openness on the efficiency of global governance;
- ✓ systematization of legal and economic approaches regarding the management of public

financial resources;

- ✓ study on the impact of public spending on economic growth in Romania;
- ✓ presentation of the role of external public audit in the management of public financial resources at national and European level;
- ✓ identifying perspectives of the use of open data in the external public audit of public financial resources.

### **Specifying the research hypotheses**

The hypotheses the research started from are the following:

- ✚ Data openness influences the increased governance efficiency ;
- ✚ Governance efficiency and corruption control have a significant impact on economic growth;
- ✚ Increasing the reuse of open data leads to less bureaucracy and more efficient use of resources;
- ✚ In Romania, there is a one-way conditioning relationship, from gross domestic product as an indicator of economic growth, to government spending;
- ✚ Capital expenditures had a positive influence on Romania's gross domestic product;
- ✚ The external public audit has an important contribution to making public institutions responsible for the efficient use of public financial resources, the protection of financial resources and their orientation towards performance;
- ✚ Using open data in the external public audit of public financial resources, results in the development and implementation of new methods and techniques of auditing in the supreme audit institutions.

### **Research methodology**

The research methodology used to achieve these objectives is based on fundamental theoretical and practical research in the field of public finance, trying to capture the role of open data in increasing governance, by increasing the efficiency of public spending and digitizing the external public audit of public finances. For this approach, we used the following research methods:

- *Documentation and documentary analysis* in the fields of economics, audit, public administration, law and public finance, respectively national and international literature on the

subject but also reports of the World Bank, the European Union, the Managing Authorities of the European Commission, the Court of Accounts of Romania, INTOSAI, EUROSAI, other European supreme audit institutions, domestic and international governmental sources but also from the non-governmental sector and international financial bodies, in order to substantiate the scientific basis of further research reflected in the bibliographic references;

- *Statistical-mathematical and econometric methods*, such as the simple and multiple linear regression method, used in econometric models in order to establish correlations between variables (regression models with panel data, least squares method, built on the EViews econometric software, and the Excel statistical-mathematical software;
- *The investigation*, conducted by collecting, processing and analyzing the available data and information, followed by issuing opinions and recommendations;
- *The synthesis method*, for clearly establishing the connections between the economic processes and the studied elements in order to elaborate the conclusions;
- *The method of interdisciplinary research*, in view of the fact that the research is based on knowledge from the fields of finance, accounting, auditing, law, mathematics, computer science;
- *The induction method*, which leads from specific particular phenomena and processes, to scientific generalizations. Thus, the economic reality is observed, the aim is to identify repetitive economic phenomena, which can be transformed into hypotheses with the help of which economic theories can be formulated;
- *The descriptive method*, which described the economic processes and theoretical concepts;
- *The statistical and the graphical method*, which enabled us to synthesize and present in a centralized way, the statistical data and the evolution of some macroeconomic indicators specific to the approached topic.

To conduct the case studies, we used data from reports published on the websites of the World Bank (<https://info.worldbank.org/governance/wgi/>), of the European Commission (<http://ec.europa.eu/eurostat/data/database>, <https://www.europeandataportal.eu>, <https://open-data.europa.eu>), of the Romanian government (<https://www.mfinante.gov.ro/pagina.html?pagina=acasa>, <http://data.gov.ro/>) and of the National Institute of Statistics (<http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table>). In order to process, obtain the results and validate the pre-established hypotheses, the EViews econometric software and the Excel statistical-

mathematical software were used.

## **The Obtained Results**

Personal contributions are presented in the content of the doctoral thesis in the form of data processing, studies, analyzes, proposals and recommendations, the most relevant being summarized in the conclusions of each main chapter.

Through the study conducted by means of the econometric analysis for 180 states with data available in the World Bank database, we demonstrated the direct link between data openness and increased governance efficiency, argued by the strong correlation between the most significant indicators of governance, namely government efficiency and corruption control, which are directly influenced by the openness of the data on the one hand, and an indicator that reflects the state of the national economy, respectively Nominal GDP / capita, on the other hand.

The results of the econometric analysis performed on the statistical data of the Romanian economy reported for the period 2004 - 2018, focusing on the relationship between public expenditures divided into current and capital expenditures and gross domestic product as an indicator of economic growth, showed that during the analyzed period, capital expenditures had a positive influence on Romania's gross domestic product, rather confirming the Keynesian theory.

We have identified two major challenges of data openness for the external public audit function, a function that directly influences the management of public financial resources. These challenges are the audit of the added value of public services following the implementation of e-government and the need to adapt audit methods and techniques to new realities, in an internationally standardized framework. Apart from the advantages of the digital transformation of the audit, we have also identified a series of limitations of this process.

Some of the results obtained during the research were disseminated through the publication of scientific articles that captured the issues discussed within the doctoral thesis and by attending international scientific conferences.

## **Limitations of the research carried out within the doctoral thesis**

We appreciate that the researched field is very vast, impossible to approach in its entirety within a doctoral thesis, and in a dynamic evolution.

Another limitation of the research was the difficulty to conduct an analysis of the

impact of open data on economic growth in each state, due to two main reasons identified: the effects of government openness will become apparent in the long run, and a viable system of indicators to measure this impact has not yet been developed.

Moreover, it was not possible to perform a comparative analysis of the impact of audit digitization at the level of SAIs, due to the lack of quantifiable and unitary indicators to assess this transformation.

We consider that these limitations can be transformed into perspectives for future research as well.

### **Synthesis of the chapters of the doctoral thesis**

The doctoral thesis is structured in the introduction, four chapters in which we addressed the main objectives deriving from the general objective of the research, finally presenting the conclusions and personal contributions.

In the introduction we presented the motivation for choosing the topic, the stage of knowledge in the fields of open data, management of public financial resources and external public audit in the Romanian and foreign literature, the research objectives, the research hypotheses, the research methodology and the research limitations. The thesis aimed at validating and invalidating the research hypotheses previously issued and arguing the conclusions formulated, through empirical case studies conducted.

The first chapter of the doctoral thesis, entitled *Public sector transformations in the context of open data and their influence on the efficiency of public expenditure*, structured on four subchapters, presents the open data from a conceptual point of view, aiming to highlight their potential to increase the efficiency of public expenditure. The increase of digitalization in all sectors of activity, has generated the emergence and development of the concepts of open government and open government data. As they have been implemented in practice, these concepts have paved the way for a new field of research in order to identify opportunities for economic development. In order to achieve the purpose and objectives they were established for, more and more public and private organizations and institutions, produce, use and collect a wide variety of data and information. They must be relevant, easily accessible, usable and reusable by all beneficiaries.

The conceptual approach to open data gives us a more accurate understanding of the terminology commonly used in the specialized literature and in the legislation adopted internationally. Even between the developed states of the world there are differences in the

conceptual approach regarding the field of open data. Thus, whereas in the United States of America, open data implies the transparency of the institution that provides the data and technical aspects regarding the practical way in which these data are reused by the general public, in developed European countries, these data must additionally meet the legal criterion of releasing the data under a license which gives users certain rights.

From the experience of developed European countries, openness of data is expected to improve both the quality and efficiency of public services provided to the population. Therefore, we consider totally appropriate the knowledge and understanding of the specialized terminology, concepts and procedures developed in this new field, which has experienced an expansive development as a result of the similar evolution of information and communication technology.

The extending research regarding the publication, use and reuse of open data has been achieved by analyzing and synthesizing the conclusions of European studies conducted so far, observing the impact on the efficiency of governance in developed European countries. Following the research, we identified a number of obstacles that may hinder the reuse of open data and proposed solutions that can be applied, starting with improving organizational communication.

For a thorough understanding of the field of open data and its possible use in increasing administrative efficiency, we have carried out a review of European and national legislation and literature. Thus, understanding the role of open data in improving the efficiency of public spending, opens a new perspective for analyzing the causes of inefficiency of public spending and at the same time helps us to identify some ways to reduce their negative impact.

The study of the specialized literature, enabled us to identify four causes of inefficiency of public spending, which can be mitigated by opening data and implementing open government. These causes are poor public governance, low fiscal and budgetary transparency, public administration corruption and excessive bureaucracy. Inspired by policies implemented in the developed countries we have proposed a set of measures to mitigate the impact of these causes that negatively affect efficiency of public financial resources that can be successfully applied in Romania.

We consider that open data and governance has as main effect, the transparency of the relationship between the two main actors in the management of public financial resources: public administration – public spending decision-maker and the population – the beneficiary

of public services. And due to a more transparent relationship between the two actors, financial resources can be allocated and used more efficiently and effectively, as a result of the population's critical and careful observation.

We appreciate that due to data openness, another opportunity has emerged for the efficiency of public spending. The development and extension at all levels of administration, of an integrated IT platform containing open data provided by public institutions generates both non-monetary benefits, such as saving time in collecting and providing data, but also monetary benefits due to cost savings, reduced bureaucracy and increased administrative transparency.

The second chapter, entitled *Opportunities for capitalizing on open data to increase governance efficiency*, structured on three subchapters, addresses theoretical issues regarding budgetary policies and budgetary performance, at international level and within the national public sector, as we appreciate that a good knowledge of current issues regarding the international experience in policies and budgetary performance, encountered in the specialized literature, is useful for understanding the transformations that have taken place in this field in Romania. The study on the experience of developed European states shows that the sustainable development of the national economy, as a member state of the European Union, is based on the implementation of budgetary principles and policies within the state legislation, on the opening and transparency of public institutions, on policies and actions harmonized with those of the Community.

On improving the management of public financial resources, there is a period of reconfiguration of the architecture principles and budgetary policies at European level, which aims to reduce the major disparities currently existing between Member States. We argued the importance of shaping coherent budgetary policies, in order to achieve consolidation and sustainability of national public finances. They must aim at increased mobilization of budget revenues and effective control of the budgetary effort, which can be achieved through efficient budgetary programming that realistically anticipates the concrete conditions of economic and social life.

In order to express an opinion regarding the accuracy and credibility of the budgets adopted in Romania after joining the European Union, we analyzed the evolution of the main synthetic indicators from the annual general execution accounts of the state budget for the period 2005-2018. a exprima o opinie în privința acurateții și credibilității bugetelor adoptate în România după aderarea la Uniunea Europeană, am analizat evoluția principalilor indicatori



sintetici din conturile generale anuale de execuție ale bugetului de stat pentru perioada 2005 – 2018. The main conclusion is that in the post-accession period, Romania's state budget increased in volume almost three times, and the budget deficit was maintained within the limit set in the Treaty on the Functioning of the European Union.

Recent decades have been marked by profound transformations in every sector of society, due to the explosive development of information and communication technologies. This development has increased the population's expectations towards public administration, in order to increase its efficiency in providing public services. Gradually, national governments around the world have implemented, more or less, principles and technologies of open government, giving people the opportunity to actively participate in the governance act.

Economic growth, which is the main goal of fiscal policy, can be analyzed by the percentage variation of GDP, which is the best synthesizer of the evolution of economic activity, due to its representativeness and compatibility in time and space.

To demonstrate empirically the link between open data and increased efficiency of public spending, we performed a series of econometric analyzes using data available in the World Bank database for 180 states. Using the simple linear regression method, we showed the high convergence relations between the variables:

- Nominal GDP / capita and governance efficiency;
- Nominal GDP / capita and corruption control;

in the two chosen periods, the year 2004 and 2018, respectively. To study the evolution over time of the analyzed economic variables, we then performed the conventional sigma and beta convergence tests. The sigma coefficient highlights the variations from the average, in the case of the governance efficiency indicator this being very close to the value 0, and the beta coefficient is a simple linear regression between the evolution (value of 2018 - value of 2004) as a dependent variable and the initial values of nominal GDP / capita in the first year, as an independent variable.

The results obtained demonstrated the direct link between data openness and increased governance efficiency, showing that there is a strong correlation between the most significant governance indicators, directly influenced by data openness; government efficiency and corruption control and Nominal GDP / capita respectively, an indicator that reflects the state of the national economy. We then analyzed how statistically correlated the two governance indicators are, beyond their conceptually high correlation, by applying the Pearson's correlation coefficient to the common sample of 180 states, both for 2004 and for 2018. The

results showed a positive and very strong correlation between governance efficiency and corruption control, the resulting values being 0.94 in 2004 and 0.898 in 2018, so very close to the extreme value 1.

Therefore, we can conclude that both the governance efficiency and corruption control have a significant impact on economic growth and similarly on the population's standard of living, which is practically synonymous with economic growth. And the two indicators analyzed also directly influence the efficiency of public spending, as we showed above.

The analysis of data maturity studies conducted in EU states, published since 2016, we found that Romania was located in the European average in the first three evaluations, whereas in the year 2019 has slightly declined as compared to the EU average and to the maximum value, which shows a lower performance of Romania compared to most European countries.

In the third chapter, entitled *The management of public financial resources within the current international context and their impact on economic growth in Romania*, structured on three subchapters, we have performed an association, both theoretically and empirically, between public expenditure and economic growth. We began the research from the legal and economic approach to public financial resources within the current European context, and subsequently we focused on some theoretical and practical aspects regarding the expenditures of the Romanian state budget in the period 2006 - 2018, analyzing their evolution in the economic and functional structure, in the post-accession period to the European Union.

There is no uniform structure of public financial resources internationally and for this very reason, in the specialized literature they are grouped according to various criteria. In Romania, public finance legislation stipulates the existence of a unitary system of budgets which manages public funds, as well as rules, procedures, principles used and duties of the central and local public institutions involved. Starting from the current legal framework, we have performed a synthesis of the main theoretical issues regarding public financial resources and current concerns at the level of the European Union regarding the improvement of the revenue system.

Increasing the volume of public expenditure is one of the solutions to stimulate national economies adopted by a number of governments worldwide. Taking as a starting point the various results of empirical studies that have investigated the relationship between public spending and economic growth, from the point of view of the two great theories (Wagnerian theory and Keynesian theory), we performed our own analysis of this relationship, on statistical data reported by Romania for the period 2004 – 2018.

We focused on the relationship between public expenditure divided into current

expenditure and capital expenditure and gross domestic product as an indicator of economic growth, to determine the extent to which economic growth has been or not affected by each of these categories of expenditure. In the analysis, we employed cross-correlations and Granger causality tests to deviations from Hodrick-Prescott trends of gross domestic product and gross capital formation, and then we tested which expense category has a higher degree of correlation with gross domestic product, using a multiple linear regression. Finally, we focused on the trend of maximizing fiscal multipliers for the period under review.

The conclusions of the study showed that during the analyzed period, capital expenditures favorably influenced Romania's gross domestic product, thus, a higher level of capital expenditures led to higher economic growth, confirming the Keynesian theory. We consider this observation to be important and can be used in a countercyclical manner. Therefore, the ratio between public expenditure and GDP should be further decompressed, and central government specialists should substantiate the expenditure part of public budgets in this context, making the necessary changes in the structure of budgets, instead of volume changes.

The empirical analysis performed at the level of Romania for the period 2004 - 2018 demonstrated that investment is an important driver of economic growth, capital expenditures positively influencing the size of gross domestic product, as well. As regards the other expenditure category analyzed, current expenditure, the relationship between this indicator and GDP was not statistically significant in the survey.

The fourth chapter, entitled *Digital transformation of public external audit and its importance in streamlining the management of public financial resources*, structured on three subchapters, presents the function of external public audit in the context of digitalization of the public sector. External public audit focuses on the formation and use of public funds, being an integral part of good governance. The study of internationally developed rules and the experience of advanced European states gives us a comprehensive perspective on external public audit from a conceptual point of view within the current European context and helps us to highlight the role of audit in the competent, clear and complete information of the population, in order to increase its confidence in the published financial statements. Using data from the Audit Reports published by the Romanian Court of Accounts, we presented the overall impact of the external public audit activity of the Romanian Court of Accounts on the correct and efficient management of public financial resources, in the period 2013 – 2018.

Research conducted in the field of external public audit of public finances, based on the study of the experience of developed countries, has revealed the importance of

performance audit missions, which provide audit institutions with a wide range of tools to make a greater contribution to improving the economy, efficiency and effectiveness of public sector entities.

The conclusions of some studies claim that, as technology has developed and has been implemented in more and more fields of activity, accounting has remained with a number of outdated methods of presentation and provision of information, this reality is common to both the public and private sectors. We consider that the function of public finance audit, whose analysis is one of the objectives of the present research, is on the same position, due to the fact that it mainly uses accounting information.

Currently, there are concerns about setting up a new audit model that is viable in the face of technological challenges using open data and that will develop a number of new audit methods and techniques, based on continuous or remote access to more complex and quantitatively significant data. Analyzing these perspectives of digitalization of the external audit of public finances, and drawing on the professional experience, we identified a series of advantages but also limitations, in order to implement them into the practice and activity of the Romanian Court of Accounts. Given the connection between the main objective of the research and data openness generated by technological development and given the central objective of external public audit, to contribute to increasing the efficiency of using public resources, we appreciate that public audit institutions are forced by the new realities to evolve towards digitalization, developing new audit methods and techniques, to increase the value and quality of the audit function and to model an efficient system that meets the society's expectations of high quality services. Open data represent a challenge with two objectives for the supreme audit institutions. Auditing the added value of public services following the implementation of ICT will certainly be one of the central themes of audit missions, and the second objective is the digitalization of the audit, in an internationally standardized framework. Public sector digital auditing opens up opportunities for a much broader approach to public sector issues and will aim to produce better audit reports, with substantial recommendations in order to increase the performance of the public sector, and, therefore, also on public spending.

The study of technologies that have been developed and tested so far by advanced states enables us to argue that electronic data analysis is the method that has already proven its effectiveness, and the other audit methods can be successfully used in specific situations.

The implementation of data openness in the public audit also has some limitations,

and we have identified, among these, reducing the direct communication between people, heterogeneity of data and respect for the independence of auditors, issues that should be considered in the process of reforming the external public audit.

At the end of the doctoral thesis, *Final conclusions, personal contributions and further developments*, presents the conclusions and research findings identified during the elaboration of the doctoral thesis, aspects concerning the validation or invalidation of the pre-established hypotheses, argumentatively highlighting the contributions, without claiming that they have been completely exhausted.

The research has outlined some future research directions, namely:

- extending the research on topics complementary to data opening, their impact on public spending and public audit;
- studying the impact of open data on budget revenues;
- developing a system of technical indicators and conducting empirical analysis on the impact of open data on economic growth at the state level;
- developing new digital auditing methods of the public sector, harmonized with its transformations.

## SELECTIVE BIBLIOGRAPHY

### I. Specialized works

1. Jansen, M., et al, The understanding of ICTs in public sector and its impact on governance, Electronic government: Proceedings of the 11th IFIP WG 8.5 international conference, EGOV 2012, Vol. 7443, pp. 174-186, (2012).
2. Afonso, A. and Alves, J, "Reconsidering Wagner's law: evidence from the functions of the government", working papers, [www.repository.utl.pt/bitstream/10400.5/11313/1/wp092016.pdf](http://www.repository.utl.pt/bitstream/10400.5/11313/1/wp092016.pdf), (2016).
3. Afonso, A., Schuknecht, L. și Tanzi, V., Public sector efficiency evidence for new EU member states and emerging markets, European Central Bank Working paper no. 581, Frankfurt, (2006).
4. Ahmad, U.G. and Loganathan, N., The causal nexus between government expenditure and economic growth in Nigeria: evidence from a bootstrap rolling window approach, The American Journal of Innovative Research and Applied Sciences, Vol. 2 no. 1, pp. 16-24, (2015).
5. Ahmed M.A., Janssen M., J. van den Hoven, Value Sensitive Transfer (VST) of Systems Among Countries, International Journal of Electronic Government Research, 8 (1), (2012).
6. Aikaterini Yannoukakoua, Iliana Arakab, "Access to Government Information: Right to Information and Open Government Data Synergy", Procedia - Social and Behavioral Sciences 147 (2014).
7. Akesson, M., Edvardsson, B., Effects of e-government on service design as perceived by employees, Managing Service Quality, 18 (5), (2008).
8. Alexiou, C., "Government spending and economic growth: econometric evidence from the South Eastern Europe", Journal of Economic and Social Research, Vol. 11 no. 1, pp. 1-16, (2009).
9. Allen, R. Schiavo-Campo, S., Garrity T. Assessing and Reforming Public Financial Management: A New Approach. Washington: World Bank, (2004).
10. Alshahrani, S.A. and Alsadiq, A.J., "Economic growth and government spending in Saudi Arabia: an empirical investigation", IMF Working Papers no. 14/3, [www.imf.org/external/pubs/ft/wp/2014/wp1403.pdf](http://www.imf.org/external/pubs/ft/wp/2014/wp1403.pdf), (2014).
11. Andrei, T., Lefter, V., Oancea, B., Stancu, S., A Comparative Study of Some Features of Higher Education in Romania, Bulgaria and Hungary, Romanian Journal for Economic Forecasting, Institute for Economic Forecasting, Vol. 2, July, (2010).
12. Anghelache, G.; Belean, P.; Risti, L.; Ginguta, A., Romania's public finances, Third Edition, Economic Publishing House, Bucharest, (2007).
13. Antipova T., Public Sector Auditing Systems in Indonesia and Russia. In: Antipova T., Rocha Á. (eds) Information Technology Science. MOSITS 2017. Advances in Intelligent Systems and Computing, vol 724. pp. 159 – 166. Springer, Cham, (2018).
14. Antipova, T., Digital public sector auditing: A look into the future: Acces la success, Calitatea, 20, 441, <https://search-proquest-com.am.e-nformation.ro/docview/2159639832?accountid=136549>, (2019).
15. Appelbaum, D., Kogan, A., Vasarhelyi, M., & Yan, Z., Impact of business analytics and enterprise systems on managerial accounting. International Journal of Accounting Information Systems, 25, (2017).
16. Arbatli E., Escolano J., Fiscal transparency, Fiscal performance and credit ratings, (2015).

17. Asatryan, Zareh; Heinemann, Friedrich; Pitlik, Hans, Reforming the public administration. The Role of Crisis and the Power of Bureaucracy, WIFO Working Papers, no. 500, <http://hdl.handle.net/10419/129049>, (2015)
18. Asimakopoulos, S. and Karavias, Y., The impact of government size on economic growth: a threshold analysis", February, Economics Letters, Vol. 139, pp. 65-68, (2016).
19. Bannister, F., Connolly, R., ICT, public values and transformative government: A framework and programme for research, Government Information Quarterly, 31 (1), pp. 119-128, 10.1016/j.giq.2013.06.002, (2014).
20. Bebre B., Using innovative tools and techniques in local Public Sector auditing. International Journal of Public Sector Auditing [serial online], 45(2):23-24, Business Source Complete, Ipswich, MA, (2018).
21. Belean, P., Anghelache, G., Risti, L., Ginguta, A. Public budget and the state treasury in Romania, Bucharest: Economic Publishing House, (2007).
22. Bistriceanu, Gh. D., Demetrescu, C. G., Macovei, E. I., Lexicon of finance - credit, accounting and financial-accounting informatics, Vol. I, Didactic and Pedagogical Publishing House, Bucharest, pg. 25, (1981).
23. Blume, L., Voigt, S., Does organisational design of supreme audit institutions matter? A cross-country assessment, European Journal of Political Economy, (2011).
24. Borglund, E., & Engvall, T. (2014). Open data? Journal of Management Management, 24 (2), 163-180 Bundeskanzleramt Austria, Volkswirtschaftliche und gesellschaftliche Potentiale of Open Data. Report of the Impacts of Open, (2017).
25. Bostan I. Fiscal control. Bucharest, Polirom Publishing House, (2003).
26. Boulescu, M., Ghiță, M., Mareș, V., *Audit Fundamentals*, Didactic and Pedagogical Publishing House, Bucharest, pg. 12, (2001).
27. Brezeanu P., Șimon I., Celea S. European taxation. Bucharest: Economic, (2005).
28. Brown-Liburd, H., și Vasarhelyi, M. A., Big Data and Audit Evidence. Journal of Emerging Technologies in Accounting, (2015).
29. Budding T., Grossi G., Public sector accounting. Taylor and Francis. New York and London, (2014).
30. Bundeskanzleramt Austria, Volkswirtschaftliche und gesellschaftliche Potentiale of Open Data. Report of the Impacts of Open Data V2, (2017).
31. Butkiewicz, J.L. and Yanikkaya, H., "Institutions and the impact of government spending on growth", Journal of Applied Economics, Vol. 14 no. 2, pp. 319-341, (2011).
32. Castelnovo, W., A stakeholder based approach to public value, Paper presented at the 13th European Conference on eGovernment, ECEG 2013, Como, Italia, (2013).
33. **Cătălin Florin ZETI, Loredana Andreea Cristea, „Causes of public expenditure inefficiency and proposals for their streamlining”, Springer Proceedings in Business and Economics - Organizations and Performance in a Complex World - 26th International Economic Conference of Sibiu (IECS), aprilie, (2020).**
34. **Cătălin Florin Zeti, Mihaela Paraschiva Luca, Cristina Pirvu, *The Impact of external public audit on public administration efficiency - Annals of the „Constantin Brâncuși” University of Târgu Jiu, Economy Series, Issue 2, (2020).***
35. **Cătălin Florin Zeti, Sebastian Ilie Dragoie, *Opinions regarding the budgetary performance in the public sector of Romania - Annals of the „Constantin Brâncuși” University of Târgu Jiu, Economy Series, Issue 2, (2020).***
36. **Cătălin Florin Zeti, Sebastian Ilie Dragoie, *Theoretical and practical aspects concerning Romania’s public finance management within the present European context , International***

**Conference Knowledge-Based Organization, vol. XXVI, (2020).**

37. **Cătălin Florin Zeti, Tatiana Ioana Stănese, Mihaela Paraschiva Luca „Influences of the data opening process on increasing the efficiency of public spending” – INCE Chișinău, (2019).**
38. Church, L., Moloney, M., Public value provision: A design theory for public e-services, Paper presented at the Annual SRII Global Conference, SRII, (2012).
39. Churchill, S.A. and Yew, S.L., "Are government transfers harmful to economics growth? A meta-analysis", August, Economic Modelling, Vol. 64, pp. 270-287, (2017).
40. Cohen, M., Rozario, A., and Zhang, C. (A.), Exploring the Use of Robotic Process Automation (RPA) in Substantive Audit Procedures. The CPA Journal, (2019).
41. Cook, M., Harrison, T.M. Using public value thinking for government IT planning and decision making: A case study, Information Polity, 20 (2/3), pp. 183-197, 10.3233/IP-150359, (2015).
42. Cosimo, M. Wagner's law and augmented Wagner's law in EU-27. A time-series analysis on starionarity, cointegration and causality, C.R.E.I. Working Papers, No. 5, October, (2010).
43. Costaş F.C., Minea Ş. F., Public finance law, Bucharest, The legal sphere, (2006).
44. Cristescu, A., " Practical approaches to e-government in Romania and Japan ", Faculty of Public Administration, SNSPA, Bucharest, (2010).
45. D'Agostino, G., Dunne, P.J. and Pieroni, L., "Government spending, corruption, and economic growth", August, World Development, Vol. 84, pp. 190-205, (2016).
46. Darono, A., & Ardianto, D., The use of CAATTs in tax audits-lessons from some international practices. EJournal of Tax Research, 14(2), 506-526, (2016).
47. Dascălu, E. D., C. Ionescu, Open governance and open data. A new perspective for the Court of Auditors' audits, Journal of the Romanian Court of Accounts no. 10, (2015).
48. Diaconu, A. Ursache, A., Specific aspects in defining the investment concept, Romanian Journal of Statistics - Supplement no. 10, (2015).
49. Diamond Jack. From Program to Performance Budgeting: The Challenge for Emerging Market Economies. International Monetary Fund, (2003).
50. Dictionary of Economics, The Second edition, Economic Publishing House, Bucharest, (2001).
51. Dinga, E., Pop, N., Dimitriu, M., A performance audit procedure on the state of harmonization of Romania with the EU acquis in the field of financial control, Expert Publishing House, Bucharest, pg. 18, (2006).
52. Dritsaki, C., Dritsaki, M., Government Expenditure and National Income: Causality Tests for Twelve New Members of E.E., Romanian Economic Journal, Year XIII, No. 38, December, (2010).
53. DudzeviÄiute, G., Peleckis, K. and Peleckiene, V., "Tendencies and relations of defence spending and economic growth in the EU countries", Engineering Economics, Vol. 27 no. 3, pp. 246-252, (2016).
54. DudzeviÄiute, G., Simelyte, A., & LiuÄvaitiene, A., Government expenditure and economic growth in the European Union countries. International Journal of Social Economics, 45(2), 372-386. doi:http://dx.doi.org.am.e-nformation.ro/10.1108/IJSE-12-2016-0365), (2018).
55. Duşescu C., Capital Market Law. Comment on articles, Bucharest, CH Beck, (2009).
56. Farr L., Future of the audit. Journal of Accountancy [serial online].August 2017; 224(2):2-3., Business Source Complete, Ipswich, MA., (2017).
57. Feleagă, N. – Comparative accounting systems, The second edition, vol. I, Economic Publishing House, Bucharest, p. 152, (1999).
58. Fielding, S. The Benefits and Threats of PBB: An Assessment of Modern Reform. In: Public Budgeting and Finance, (1999).



59. Flak, L.C., Solli-Sæther, H., StraubTowards, D., A theoretical model for co-realization of IT value in government proceedings of the 48th Hawaii International Conference on System Sciences (HICSS-48), pp. 2486-2494, (2015).
60. Fossati E., și colab., The ECALab – our in-house incubator for applying data analytics, data visualisation and process mining to audit, ECA Journal 1/2020 – BIG DATA & digital audit, (2020).
61. Frank Bannister, Regina Connolly, ICT, public values and transformative government: A framework and programme for research, Government Information Quarterly, Volume 31, Issue 1, <https://doi.org/10.1016/j.giq.2013.06.002>, (2014).
62. Ghe. Manolescu, Buget. Economic and financial approach, Economic Publishing House, Bucharest, (1997).
63. Granger, CWJ, Investigating Causal Relations by Econometric Models and Cross-spectral Methods, *Econometrica*, Vol. 37, No. 3., pp. 424-438, August, (1969).
64. Granger, CWJ, „Testing for causality”, *Journal of Economic Dynamic and Control*, Vol. 4, p. 229-252, (1980).
65. Harrison T.M., et all, Open government and e-government: Democratic challenges from a public value perspective, *Information Polity: The International Journal of Government & Democracy in the Information Age*, 17 (2), pp. 83-97, (2012).
66. Hodrick, Robert; Prescott, Edward C., "Postwar U.S. Business Cycles: An Empirical Investigation, (1997).
67. Gliga, I., Financial law, Humanitas Publishing House, Bucharest, (1998).
68. Inceu, A. M., Lazăr, D. T., Moldovan, B., *Public finances and budgets*, Cluj Napoca: Accent Publishing House, (2009).
69. J. Rabin, Handbook of Public Budgeting, Marcel Dekker, New York, (1992).
70. Jansen A., The Understanding of ICTs in Public Sector and Its Impact on Governance, Proceedings of the 11th IFIP WG 8.5 international conference,, EGOV 2012, Kristiansand, Norvegia, (2012).
71. Janssen, M., Flak, L.S., Government Architecture: Concepts, Use and Impact, M.A. Wimmer, M. Janssen, H.J. Scholl (Eds.), *Electronic Government: Proceedings of the 12th IFIP WG 8.5 International Conference, EGOV 2013*, 8074, pp. 135-147, (2013).
72. Janssen, Marijn, Yannis Charalabidis, and Anneke Zuiderwijk. "Benefits, adoption barriers and myths of open data and open government." *Information systems management* 29.4, 258-268, (2013).
73. Joshua Tauberer, Open government data, second edition, (2014).
74. Kaufmann, D., Kraay, A. & Mastruzzi, M. The Worldwide Governance Indicators: Methodology and Analytical Issues. *Hague J Rule Law* 3, p. 220–246, (2011).
75. Kelton, Stephanie. „Limitations of the government budget constraint: Users vs. issuers of the currency” *Panoeconomicus*, 58, p.57-66, (2011).
76. Keynes M. J., *The General Theory of Employment, Interest, and Money*, <http://cas.umkc.edu/economics/people/facultypages/kregel/courses/econ645/winter2011/generaltheory>, (1935).
77. Kozhan, R., *Financial Econometrics*, Roman Kozhan & Ventus Publishing ApS, p. 119, (2010).
78. Kumar, S., Webber, D.J. and Fargher, S., "Wagner's law revisited: cointegration and causality tests for New Zealand", *Applied Economics*, Vol. 44 no. 5, pp. 607-616, (2012).
79. Larch, M. and Lechthaler, W., "Buy national or buy international? The optimal design of government spending in an open economy", April, *International Review of Economics and Finance*, Vol. 26, pp. 87-108, (2013).

80. Liddy, J. P., How data and analytics are enhancing audit quality and value: Certified public accountant. *The CPA Journal*, 85(5), (2015).
81. Loto, M.A., "Impact of government sectorial expenditure on economic growth", *Journal of Economics and International Finance*, Vol. 3 no. 11, pp. 645-652, (2011).
82. Lupu, D., Lazăr C., Influence of e-government on the Level of Corruption in some EU and Non-EU States, *Procedia Economics and Finance*, Volume 20, Pag. 365-371, ISSN 2212-5671, [https://doi.org/10.1016/S2212-5671\(15\)00085-4](https://doi.org/10.1016/S2212-5671(15)00085-4), (2015).
83. M. Scott, W. Delone, W. Golden, Measuring Success eGovernment: An approach to public value, *European Journal of Information Systems*, 25 (3), (2016).
84. Marc Robinson, Duncan Last, A Basic Model of Performance-Based Budgeting, *International Monetary Fund*, (2009).
85. McCollum T., Audit in an age of intelligent machines. (cover story), *Internal Auditor* [serial online], 74(6):24-29. Available from: Business Source Complete, Ipswich, MA., (2017).
86. McLeod, J. " Thoughts on opportunities for registration of professionals in the field of open access, open data agenda ", *Journal Management Management*, Vol. 22 Nr. 2, pp. 92 – 97, (2012).
87. Moggia, G., Varga, Z., Connecting data and processes in audit – some considerations about the use of process mining, *ECA Journal 1/2020 – BIG DATA & digital audit*, (2020).
88. Montes, GC et al., Fiscal transparency, government effectiveness and government spending efficiency: Some international evidence based on panel data approach, *Economic modelling*, (2018).
89. Monti M., Dăianu D., Fuest C., Georgieva K., Kalfin I., Lamassoure A., Moscovici P., Simonyte I., Timmermans F., Verhofstadt G., Future financing of the EU: final report and recommendation of the High Level Group on own resources. European Commission, Brussels. <http://ec.europa.eu/budget/mff/hlgor>, (2017).
90. Murphy, D.P., "How can government spending stimulate consumption?", *Review of Economic Dynamics*, Vol. 18 no. 3, pp. 551-574, (2015).
91. Murphy, M. L., C.P.A., & Tysiac, K., Data analytics helps auditors gain deep insight. *Journal of Accountancy*, 219(4), (2015).
92. Nyasha, S., & Odhiambo, N. M., Government Size and Economic Growth: A Review of International Literature, (2019).
93. Olson O., Guthrie J., Humphrey C. Growing Accustomed to Other Faces: The Global Themes and Warnings of Our Project. Osaka: Second Asian Pacific Interdisciplinary Research in Accounting Conference, (1998).
94. Omar, K., Scheepers, H., Stockdalee, R., Government service quality assessed through the public value lens, Paper presented at the Electronic Government, Proceedings of the 10th IFIP WG 8.5 international conference, EGOV 2011, Delft, The Netherlands (2011),
95. Oprea, F., Public budget systems: Theory and practice, Economic Publishing House, (2011).
96. Osmani M.W., Weerakkody W., Sivarajah U., El-Haddadeh R., The public value of social media in the UK public sector, (2014).
97. Pang M.S., Lee G., DeLone W.H., IT resources, organizational capabilities, and value creation in public sector organisations: A public-value management perspective, *Journal of Information Technology*, 29 (3), pp. 187-205, (2014).
98. Păun, A., Brezeanu, P., Theoretical aspects regarding public expenditures, *Annals of the University of Petroșani. Economics, Petroșani*, Vol. 13, (2013).
99. Pereș, I. et. all, Research of the Contribution of Supreme Audit Institutions to Government Efficiency and to Corruption Perception, *Audit financiar*, nr. 4, (2014).

100. Pigou A., *Theories of Welfare Economics, Wealth and Welfare*. London: Macmillan, (1948).
101. Pînzaru, T., *E-governance: concept and value*, National Law Journal: theory and practice, (2014).
102. Piroi, M., & Paunica, M., *How can technology help reduce Romania's budget deficit*, Kidmore End: International academic conferences Limited, (2015).
103. Platis, M., *Public sector economics*, Bucharest: University Publishing House, Bucharest, (2002).
104. Raphae, J., C.P.A. *Rethinking the audit*. Journal of Accountancy, 223(4), 28-32, (2017).
105. Ravn M. O., Uhlig H., "On adjusting the Hodrick-Prescott filter for the frequency of observations," *The Review of Economics and Statistics*, MIT Press, vol. 84(2), pages 371-375, (2002).
106. Rose J., Persson, J.S., Heeager L.T., *How e-Government managers prioritise rival value positions: The efficiency imperative*, Information Polity, 20 (1), pp. 35-59, (2015).
107. Rose, J., Persson, J.S., *E-government value priorities of Danish local authority managers*. IT Management in Local Government: The DISIMIT Project, pp. 27-56, (2012).
108. Rota, V. *Digitalisation of audit procedures: a pilot project for the financial audit of the European Commission's executive agencies*, ECA Journal 1/2020 – BIG DATA & digital audit, (2020).
109. Rubin I. S., Kelly J. *Budget and Accounting Reforms*. In: Ewan Ferlie, Laurence E. Lynn, Jr., Christopher Pollitt. *The Oxford Handbook of Public Management*. Oxford: Oxford University Press, (2005).
110. Scott M., Delone W., Golden W., *Measuring Success eGovernment: An approach to public value*, European Journal of Information Systems, 25 (3), (2016).
111. Seulki Lee-Geiller, Taejun (David) Lee, *Using government websites to enhance democratic E-governance: A conceptual model for evaluation*, Government Information Quarterly, Volume 36, Issue 2, (2019).
112. Smith, A. *The Wealth of Nations*, New York, Modern Library, (1994).
113. Stiglitz, JE, *Economics of the Public Sector – The third edition*, Editura Norton & Co., New York, (2000).
114. Suffield, M., *Association of Chartered Certified Accountants (ACCA), Auditors of the future – what are the skills needed in a digital age?*, ECA Journal 1 – BIG DATA & digital audit, (2020)
115. Susskind, Richard and Daniel, *The Future of the Professions - How Technology Will Transform the Work of Human Experts*, Oxford, Oxford University Press, (2017).
116. Țepuș, A., *The Wagnerian hypothesis from the perspective of the Romanian economy*, Volum XIX (2012), No. 8(573), (2012).
117. Twizeyimana, J. D., Andersson, A., (2019), *The public value of E-Government – A literature review*, Government Information Quarterly, Volume 36, Issue 2, (2019).
118. Ubaldi, Barbara. "Open government data: Towards empirical analysis of open government data initiatives." *OECD Working Papers on Public Governance* 22, (2013).
119. Ungureanu, M. A. (coordinator), *Budget and public treasury*, University Publishing House, (2020).
120. Ungureanu, M. A. (coordinator), *Budget and public treasury*, University Publishing House, (2011).
121. Ungureanu, M.A. (coordinator), *Public finances. Syntheses and applications*, Conphys Publishing House, (2007).
122. Văcărel, I. (coord.), *Public finances, the fourth edition*, Didactic and Pedagogical Publishing House, Bucharest, (2007).
123. Vasarhelyi, M., A., *Smart Audit: the digital transformation of audit*, ECA Journal 1/2020 – BIG DATA & digital audit, (2020).
124. Veljković, Nataša, Sanja Bogdanović-Dinić, and Leonid Stoimenov. "Benchmarking open

- government: An open data perspective." Government Information Quarterly 31.2, p.278-290, (2014).
125. Vilfredo Pareto, *Manuale di Economia Politica*, (1974).
  126. Vito Tanzi, Ludger Schuknecht, Antonio Alphonso, Public sector efficiency Working Paper nr.242, European Central Bank, (2003).
  127. Warren, J. D., & L, M. S., Continuous auditing: an effective tool for internal auditors. *Internal Auditing*, 21(2), (2006).
  128. **Zeti Cătălin Florin, et all, "Prospects of reforming the budgetary process, in the context of transformations at European level", *Annals of the „Constantin Brâncuși” University of Târgu Jiu, Economy Series, Issue 4, (2018).***
  129. **Zeti Cătălin Florin, et all, "The role of data opening in creating added value", *Annals of the „Constantin Brâncuși” University of Târgu Jiu, Economy Series, Issue 6, (2017).***
  130. Zhang, C., Intelligent Process Automation in Audit. *Journal of Emerging Technologies in Accounting*. Forthcoming, . (2019)

## **II. Legislation, regulations and reports of regulators**

1. Directive 2003/98/EC on the re-use of public sector information.
2. Directive 2013/37/UE amending Directive 2003/98/EC on the re-use of public sector information.
3. Regulation (EU) 2016/679 of the European Parliament and of the Council.
4. Council of Europe Regulation no. 1605/2002 of June 25, 2002, <https://op.europa.eu/ro/publication-detail/-/publication/ebe2dd36-9649-499a-be6a-f668f177c90f/language-ro>.
5. Council of Europe Regulation no. 1605/2002 of June 25, 2002, <https://op.europa.eu/ro/publication-detail/-/publication/ebe2dd36-9649-499a-be6a-f668f177c90f/language-ro>.
6. UK National Audit Act of 1983.
7. Law establishing the Romanian Court of Accounts of January 24, 1864, published in the Official Monitor no. 18 of January 24, 1864, art. 15.
8. Public Finance Law no. 500/2002, published in the Official Monitor of Romania no. 597 of August 13, 2002.
9. Law no. 109 of 25/04/2007 on the reuse of information from public institutions, published in the Official Monitor no. 300 of May 5, 2007.
10. Law no. 217/2008 for amending and supplementing the Law no. 94/1992 on the organization and operation of the Court of Accounts, published in the Official Monitor of Romania no. 724 of October 24, 2008.
11. Law no. 544/2001 on free access to public information, published in the Official Monitor of Romania no. 663 of October 23, 2001.
12. Law no. 69 of April 16, 2010 fiscal-budgetary responsibility, re- published in the Official Monitor no. 472 of June 04, 2020.
13. Law no. 94 of September 8, 1992 on the organization and operation of the Court of Accounts, , re-published in the Official Monitor no. 238 of April 03, 2014.
14. Government Decision no. 123/2002 for the approval of the Methodological Norms for the application of the Law no. 544/2001 on free access to public information, published in the Official Monitor no. 167 of March 8, 2002.
15. Government Decision no. 583/2016 of August 10, 2016 on the approval of the National Anti-Corruption Strategy for the period 2016 - 2020, of performance indicators sets, of risks associated

with the objectives and measures in the strategy and the sources of verification, the inventory of measures of institutional transparency and prevention of corruption, of evaluation indicators, as well as standards for publishing information of public interest, published in Official Monitor no. 644 of August 23, 2016.

16. Government Decision no. 215 of 2012 on the approval of the National Anti-Corruption Strategy for the period 2012-2015, of the Inventory of anti-corruption preventive measures and evaluation indicators, as well as of the National Action Plan for the implementation of the National anti-corruption Strategy 2012-2015 ul Romanian Government, National action plan (NAP) 2016 - 2018 in the field of open data, published in Official Monitor no. 202 of March 27, 2012.
17. The Declaration of Lima on Public Finance Audit Guidelines, adopted by the 9th INTOSAI Congress – the 4<sup>th</sup> section
18. A Statement of Basic Auditing Concepts, American Accounting Association (AAA) (1973)
19. European Commission, Spring 2018 Economic Forecast – Romania, 3 May 2018.
20. European Commission, The European Data Market Study: Final Report. Available at <http://www.datalandscape.eu/study-reports>, (2017)
21. European System of Accounts (ESA), Eurostat/European Commission, Publication Office of the European Union, Luxembourg, (2010)
22. European Union, Creating Value through Open Data: Study on the Impact of Re-use of Public Data Resources, (2015)
23. OECD, Thematic document: “ Corruption and economic growth”, (2013).
24. OECD, Government at a glance, OECD Publishing (2017).
25. OECD. Budget Practices and Procedures Database. OECD/World Bank, <http://oecd.dyndns.org>, (2003).
26. OECD. Performance Budgeting in OCDE Countries, (2007).
27. Open Data Initiative, <http://www.whitehouse.gov/open>.
28. Open Knowledge International, <https://okfn.org/> .
29. INTOSAI Statutes and Audit Standards.
30. World Bank, Functional Analysis of the Public Finance Sector, Final Report, (2010).
31. Performance Audit Manual, The Court of Accounts of Romania, Bucharest, (2013).
32. National action plan 2018 - 2020 in the field of open data, Romania’s Government, (2018).
33. The Annual public reports of the Romanian Court of Accounts, published in the period 2013-2019.

### **III. Electronic Bibliography:**

1. [https://europa.eu/european-union/about-eu/money/revenue-income\\_ro](https://europa.eu/european-union/about-eu/money/revenue-income_ro)
2. <http://data.gov.ro/>
3. [http://ec.europa.eu/budget/mff/hlgor/final-report/index\\_en.cfm](http://ec.europa.eu/budget/mff/hlgor/final-report/index_en.cfm)
4. <http://ec.europa.eu/eurostat/data/database>
5. <http://ogp.gov.ro/>
6. <http://opendatabarometer.org>
7. <http://www.inovarepublica.ro/proiect-guvernare-deschisa/>
8. <http://www.publishwhatyoufund.org>
9. <http://www.whitehouse.gov/open>
10. <https://data.europa.eu/euodp/data/>
11. <https://ec.europa.eu/eurostat>
12. [https://europa.eu/european-union/about-eu/money/revenue-income\\_ro](https://europa.eu/european-union/about-eu/money/revenue-income_ro)

13. <https://info.worldbank.org/governance/wgi/>
14. <https://itunes.apple.com/us/app/harta-edu/id1222979915?mt=8>
15. <https://ncss-wpengine.netdna-ssl.com/wp-content/themes/ncss/pdf/Procedures/NCSS/Cross-Correlations.pdf>
16. <https://open-data.europa.eu>
17. <https://sgg.gov.ro/new/guvernare-deschisa/>
18. <https://tfl.gov.uk/>
19. <https://theodi.org>
20. <https://www.europeandataportal.eu>
21. <https://www.opendatasupport.eu/linked-data/>
22. <https://www.opengovpartnership.org/>
23. <https://www.w3.org/2013/share-psi/>
24. [www.cafr.ro](http://www.cafr.ro)
25. [www.eca.europa.eu](http://www.eca.europa.eu)
26. [www.mfinante.ro](http://www.mfinante.ro)
27. [www.rcc.ro](http://www.rcc.ro)
28. [www.sigma.org](http://www.sigma.org)