Universitatea "Lucian Blaga" din Sibiu

Doctoral School of Social Sciences
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DOCTORAL THESIS
Summary

THE CONTRIBUTION OF PUBLIC INVESTMENT TO SUSTAINABLE ECONOMIC GROWTH. THEORETICAL AND EMPIRICAL EVIDENCE AT THE LEVEL OF EMERGING STATES IN CENTRAL AND EASTERN EUROPE

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CONTENTS

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INTRODUCTION

Motivation for Choosing the Topic, Novelty, Topicality and Importance

Sustainable economic growth is a topic of interest, located at the center of the development agenda in the European Union and internationally. Economic growth occurs when real output records growth rates. But the question is: how can economic growth be achieved without compromising the quality of life and the environment, now and especially in the future?

The choice of the research theme is motivated by the current concerns regarding the achievement of sustainable development objectives, of which the most problematic is sustainable economic growth. The negative impact on the environment, large territorial gaps in infrastructure (even within a country) and standard of living attract a greater responsibility of governments and involve quality public investment. The current pandemic crisis has demonstrated this.

There are many contradictions between the econometric literature, which quantitatively measures the impact of public investment on economic growth, and the large literature of public policy guidelines, which estimates public infrastructure gaps and provides guidance for making the necessary investments in different sectors.

At the level of scientific and doctoral research in general, the impact of public investments on sustainable economic growth in the broad framework of the 2030 Agenda for sustainable development is little investigated, an aspect that gives novelty and interest to the approach theme. The character of originality and novelty is completed by carrying out a practical study in the emerging countries of the Central Eastern European area of the EU, which aims to bring fundamental clarifications and fill the existing deficit in the literature regarding this category of countries, in the context of sustainability.

The proposed scientific approach is thus separated from other studies, by addressing the effect of public investments on economic growth in the current context of sustainability. In 2019, through the European Ecological Pact, the European Commission declares the EU's ambition to be the first in the world to achieve climate neutrality by 2050. Given the importance of sustainability, closer investigation of the relationship between public investment and sustainable economic growth is welcome, which can provide real support to public decision-makers in undertaking and accelerating actions for sustainable development.

The purpose of this course is to provide a deep understanding of the current framework, which will contribute to the realization of viable investment projects with impactful economic and social benefits, and which, with sustainable financing, will lead to sustainable economic results. In an unstable economic period, characterized by high fiscal pressure, large basic infrastructure deficits, questionable sustainability of public finances, significant deviations from assumed objectives, fiscal and budgetary reforms are needed for economic recovery through public investments.

Placing the Research Topic in the Context of Relevant Scientific Research and in an Interdisciplinary Context

Doctoral thesis entitled ”The contribution of public investments to sustainable economic growth. Theoretical and empirical evidence at the level of the emerging states of Central and Eastern Europe” deals with topics of maximum interest, such as: sustainable development, sustainable economic growth, relevant macroeconomic indicators in the measurement of sustainable economic growth, the circular economy, the engagement of public investments in order to ensure a future healthy for future generations, the importance of the investment process, fiscal constraints, financing to achieve the objectives of sustainable development, and aims to create new rationales of value in the context of sustainable development.

The scientific research undertaken presents theoretical and practical utilities, as it focuses on important and current issues for the public sector, especially in developing countries, the correct understanding and application of which contribute to increasing the efficiency of the use of public resources and achieving the SDGs. The practical utility results from the investigations and econometric study carried out for developing countries.

The paper analyzes the emerging countries of Central and Eastern Europe, members of the EU, respectively: Romania, Hungary, Bulgaria, Estonia, Poland, Lithuania, Latvia, the Czech Republic, Slovenia, Slovakia, Croatia. The rationale behind the selection of these countries is based on the similarities between them (countries that were under communist regimes), the progress made by these countries after the fall of the communist regimes and the potential for public investment for development, superior to that existing in developed countries.

The complexity of the topic approached in the doctoral thesis involves the study of specialized literature from vast fields such as: public finance and taxation, economics, econometrics, environmental protection, political sciences, law and administrative sciences.

”State of the Art” Specialized Literature

The decline in public investment, especially in the context of economic crises, has led to calls for boosting public investment spending as a way to boost short-term demand and output. In this context, although there is a vast literature investigating this topic, economic growth and its determinants, including public investment, continue to be an important topic of debate among researchers.

Despite numerous studies, the results are contradictory, with no valid general consensus regarding the impact of public investment on economic growth. At the same time, most research works focus on developed countries or groups of countries, with fewer research concerns directed towards developing countries being identified.

Investments in public infrastructure must be one of the main directions addressed by governments, considering their justification as a public good with widely distributed benefits for the population. This idea dates back at least to Adam Smith (1776), according to which one of the duties of the state concerns the provision and maintenance of complementary public goods that would facilitate the development of markets and long-term economic growth. The empirical question that has stimulated considerable research in the literature concerns the productivity of public investment.

According to neoclassical economic models, since the rate of economic growth is exogenously determined, government investment has no positive impact on economic growth. In most empirical studies, the estimated equations are derived from neoclassical economic theory (Ramirez and Nazmi, 2003, Khan and Kumar, 1997).

Relevant to the research topic addressed are the works of Aschauer (1989), who identified a strong positive relationship between public capital and GDP growth in developed economies, or of Lucas (1988), Barro (1990) and Romer (1996) , who developed endogenous growth models, where public investment is treated as a significant factor. In addition to the examinations carried out in academia, the stimulating role of public investment is treated with interest by international organizations and influential policy makers.

The analysis of the current state of scientific knowledge regarding the research topic suggests the importance of public investments in boosting economic growth, also highlighting the lack of research on this phenomenon in the framework of sustainable development.

Research Objectives

Doctoral thesis with the title "The contribution of public investments to sustainable economic growth. Theoretical and empirical evidence at the level of the emerging states of Central and Eastern Europe" has as its main objective the evaluation of the contribution of public investments on sustainable economic growth, trying to capture its new connotations and limitations in the framework of sustainable development. The approach to the determining role of public investments took into account sustainability criteria, the analysis of the adequacy of indicators for measuring sustainable economic growth, the sustainable financing of public investments and budgetary constraints.

The foundation of the main objective was achieved in the context of the following secondary objectives:

- ✓ the presentation and analysis of the conceptual elements regarding sustainable development, in order to delimit sustainable economic growth, economic development and sustainable development within the specialized literature;
- ✓ presentation and systematization of the main theories and models of economic growth;
- ✓ analysis of the role of the circular economy in sustainable development;
- ✓ highlighting the financial resources allocated to sustainable development and the role of public investment policy;
- ✓ presentation and analysis of conceptual and practical elements regarding public investments;
- ✓ highlighting the role of public investment management in the development of public investments;
- ✓ investigating the economic context and macroeconomic indicators for measuring sustainable economic growth;
- ✓ analysis of the state of knowledge and review of studies on the impact of public investments on sustainable economic growth;
- ✓ systematization of the revised specialized literature;
- ✓ studying the investment process;
- ✓ description of the european framework in the evaluation of public investment projects;
- ✓ the analysis of the implications of the Cost Benefit Analysis and the presentation of the evaluation methodology;
- ✓ highlighting the ways for sustainable financing of public investments;
- ✓ analysis of budgetary constraints and presentation of the evolution of fiscal policy indicators at the EU level;
- ✓ the approach to the financing of public investments in the context of economic crises;

✓ the econometric study of the effect of public investments on sustainable economic growth in the emerging countries of Central and Eastern Europe.

Specifying Research Hypotheses

In order to carry out the research of the addressed topic, the following hypotheses were established:

- Sustainable economic growth is a component of sustainable development, constituting one of the major objectives of sustainable development;
- Considering the harmful results on the environment and humans released by the economic activity, the circular economy is a necessary lever to have sustainable economic growth;
- Public investment management has a major role in the investment process, in which the cost-benefit analysis is the key tool in the evaluation and selection of investment projects with maximum benefits in the framework of sustainable development;
- GDP is the relevant indicator in measuring sustainable economic growth;
- The limited fiscal space restricts the realization of public investments to the necessary potential;
- Public investments have a positive impact on sustainable economic growth, considered the main hypothesis, for which two secondary hypotheses were formulated:
  - There is a strong positive correlation between public investment and private investment (crowding-in or crowding-out effect);
  - Public investments have a decisive role in achieving sustainable economic growth.

Research Methodology

To fulfill the research objectives, a methodology based on theoretical and empirical research in the field of public finance, understanding sustainable economic growth and evaluating the impact of public investments on economic growth in the conditions of sustainable development was used. The following research methods were applied for this approach:

- *Documentation and documentary analysis* in the specialized field (public finance), as well as in other sectors of science with influence on sustainable development (economy, environment, social sciences, political sciences, public administration), relevant national and international literature, reports of various international institutions and organizations (EU, IMF, OECD, Eurostat, World Bank), governmental sources and non-governmental organizations, domestic and international, as well as other sources, for an adequate scientific substantiation of research on sustainable economic growth and the impact of public investments, as one of the determining factors, reproduced in the bibliographic/webliographical references;

- *The interdisciplinary research method*, taking into account the use, within the research, of information from various fields, such as: public finance, economics, legal and administrative sciences, statistics and econometrics;
- *Statistical-mathematical and econometric methods*, such as the Hodrick-Prescott trend, the Granger test, the autoregressive vector and others, built by using the EViews econometric program;
- *Investigation*, consisting in the collection, systematization, analysis and interpretation of data, analysis of current reports, followed by the formulation of recommendations;
- *The synthesis method*, which contributes to the identification of existing connections between the economic processes and the studied elements and makes it possible to formulate conclusions;
- *The induction method*, by which the transition from particular phenomena and developments to generalized scientific formulations is achieved.
- *The deduction method*, which starts from general theories or hypotheses to arrive at concrete processes and allows obtaining new truths from existing knowledge based on deductive reasoning.
- *Descriptive method*, which describes the characteristics of the economic processes studied and the theoretical concepts (economic growth, economic development, sustainable development, sustainable economic growth, public investments, circular economy);
- *The comparative method*, with the help of which an analysis of the concepts of economic growth and economic development, of economic theories was carried out, the main theoretical and empirical aspects of the concept of public investments and the implications on sustainable economic growth were identified, with the aim of highlighting distinctive or similar elements;
- *Graphical and statistical methods*, with the help of which statistical data were analyzed and systematized and the dynamics of macroeconomic indicators characteristic of the topics addressed were presented, using Excel and IDEA software for data processing.

The criteria used to carry out the econometric studies were the following:

- *The theoretical model*, which made it possible to analyze the main theories underlying public investments and their contribution to sustainable economic growth, as well as existing empirical results;
- *Empirical study*, following the existence of empirical research and a clear

methodology.

The research paper used only official data, published by authorized institutions and available online. Thus, data reported on the websites of the EC (https://ec.europa.eu/eurostat, https://cohesiondata.ec.europa.eu/funds/cf), the World Bank (https://datatopics .worldbank.org/), Ministry of Finance (https://mfinante.gov.ro/), UN (https://unstats.un.org/, https://unctad.org/), OECD (www.oecd .org). The processing, analysis and validation of the predetermined hypotheses were carried out using Excel and EViews software.

SYNTHESIS OF THE CONTENT OF THE DOCTORAL THESIS

The doctoral thesis has the following structure: introduction, four chapters, in which the stated main and secondary objectives were treated, and a final chapter, which presents the conclusions, personal contributions and recommendations derived from the research.

The fulfillment of the research objectives aimed during the doctoral thesis to validate or invalidate the previously formulated research hypotheses, as well as to argue the formulated conclusions, through the analyzes and empirical studies carried out.

Chapter I ”Conceptual delimitations and economic theories regarding sustainable development” represents an approach and systematization of the various elements that allow highlighting the complexity of sustainable development. In a first stage, an exposition of the conceptual elements and the existing relationships between them is welcome, with a delimitation of the concept of sustainable development versus economic development and sustainable economic growth.

Another important aspect is the placement of sustainable development in a European and international context, as well as the presentation of indicators for measuring the objectives of sustainable development (SDG). Sustainable economic growth represents the objective of sustainable development addressed in the research, as a result of the existing growth potential in emerging countries. GDP, although not an indicator intended to measure economic and social well-being, remains the indicator used to monitor sustainable economic growth.

Another issue of interest addressed refers to the circular economy and its implications on sustainable development, given that defining elements for economic growth, such as production and consumption, generate waste and endanger the finite resources of the planet.

For a deep understanding of the concept of sustainable economic growth and its determinants, the main theories and models of economic growth have been presented and systematized, highlighting historical thinking that captures the evolution of the economy over time and is still found today in the foundation of economic policies. According to Keynesian theories, the mere use of public resources for investment spending is not enough, unless the multiplier effect is visible in the economy. Among the economic growth models, the endogenous models stand out, such as those developed by Romer, Lucas, Barro, which demonstrate the accelerating role of public investments in the economic growth process.

Considering the key role of public administrations, central and local, in providing adequate infrastructure, necessary to fulfill the SDGs, the role and importance of public investment policies was highlighted. The state is the main investor in infrastructure, and investment decisions and institutional capacities directly affect the quantity and quality of infrastructure and how it supports growth, inclusiveness and sustainability.

Chapter II ”Public investments - methodological approaches regarding the influence exerted on sustainable economic growth” circumscribes the main objective of the research, highlights relevant aspects regarding public investments and deals in the beginning with theoretical and practical elements of public investments, different in most cases by purpose, utility and profitability of private investments.

Public investment management is of major importance in the process of allocating public funds for investment, providing a solid framework underpinning efficient spending and helping to reduce waste. Understanding the economic context is also essential to see how it can influence the financing of public investments. Thus, the need to ensure significant public investment needs has led to different approaches adopted by countries to maintain economic and financial stability.

Another problem studied refers to the relevance of certain macroeconomic indicators in measuring sustainable economic development. Indicators "Beyond GDP" are treated in this way, such as Adjusted Net Savings as a percentage of GNI, the Human Development Index, the Economic Well-being Index, highlighting the main advantages and disadvantages of GDP in relation to alternative indicators. In the same context, an analysis of the evolution of the growth rate of the real GDP indicator and the ANS was carried out in the countries that are the subject of the research, which shows that the economies are on the path of sustainable development and gives originality in the approach.

A useful approach in the research undertaken is to understand and examine the relationship between public investment and sustainable economic growth. For this purpose, an extensive review of specialized studies was carried out, capitalized by a systematization of the conclusions drawn, which suggest, in general, a positive impact of public investments on sustainable economic growth.

Chapter III ”Financing methods for public investments in the context of budgetary constraints and global economic crises” deals with essential elements, which guide public administrations in making viable investments with economic and social impact benefits. The first part of the chapter addresses the investment process, with an emphasis on Cost-Benefit Analysis as an essential method in the evaluation of large infrastructure projects. The realization of those investments that encompass economic and social benefits is preceded by a complex process of evaluation and selection, which is based on specific methods and techniques, and which, if carried out with high responsibility and competence, ensures the prioritization and implementation of those types of investments that meet the most urgent development needs. A new element is the highlighting of the economic-financial parameters that underlie the need for co-financing at the EU level. At the European level and at an extended global level, methodologies are applied to evaluate public investment projects in a highly competitive environment as a result of limited financial resources, so a systemic approach to them was considered appropriate.

Also, another aspect with major influence is the financing of public investments. Considering the budgetary constraints established by the Growth and Stability Pact, imposed by the EU on the member states, it was necessary to analyze the conjunctural situations that can influence access to financing for public investments, with reference to the budgetary constraints and periods of economic crises, which make it difficult the budgeting process and execution of public investment expenditures.

In chapter IV **”Empirical evidence regarding the effects of public investments on sustainable economic growth in the emerging countries of Central and Eastern Europe”**, the main concern is given by conducting empirical research, which investigates, through econometric methods, the effect of public investments on sustainable economic growth, in the purpose of fulfilling the main objective of the doctoral thesis.

The empirical research was carried out on a sample of countries from Central and Eastern Europe, members of the EU, characterized by similar economies and regimes.

In a first step, it was demonstrated that real private investments determine economic cycles. Applying the Hodrick-Prescott filter and lag-lead correlations shows a strong statistical relationship between real private investment and GDP, with declines in private investment producing recessions. The results were confirmed by applying the Probit regression, after removing the data from the pandemic period.

Starting from the fact that fluctuations in private investment can be counterbalanced by public investment to moderate economic cycles, the impact of public investment on private investment was analysed. Private investment drives the business cycle, suggesting that large declines in real private investment can drive the economy into a recession. The effect of real public investments on real private investments manifests itself in the short term, which implies that they can be an effective tool for reducing the output gap.

Therefore, the interpretation of the results of the study reveals a strong correlation between public and private investments, with an influence that can be bidirectional, thus validating the first main hypothesis of the research.

The analysis of the effect of public investments on sustainable economic growth was carried out by applying the VAR model and impulse response functions, the results being confirmed by estimating the accumulated multiplier to obtain the GDP response to a shock equal to one standard deviation of public capital.

Although the multiplier of public capital in the sample is generally positive at the beginning, in most cases it becomes negative in the medium term. From the sample, only in the Czech Republic and Hungary is the multiplier positive in any period, both in the short and in the medium term. Thus, we can conclude that, in general, in developed states, public investments have a strong and positive effect, validating the second main hypothesis of the research. The lack of corruption and the credibility of the government are the important factors of the public capital multiplier along with the level of debt.

The research shows that in most of the sampled countries, the long-run impact of a public capital shock on GDP is estimated to be negative, as opposed to a positive short-run impact. In developing countries, corruption and inefficiency of public investment may be explanatory factors. The results of the study support the positive contribution of public investments on sustainable economic growth, demonstrated in developed countries, where phenomena such as corruption are completely isolated.

In **Chapter V**, the conclusions and results obtained from the research are presented, which confirm or disprove the pre-established hypotheses, and proposals are formulated for capitalizing on the findings that emerge from the study carried out. Considering the complexity of the topic addressed, the limits of the research were recognized and future research directions were drawn in the studied field.

Obtained Results

The doctoral thesis highlights the own conclusions, recommendations and contributions, which resulted from the research of the main objective and the associated secondary objectives, presented throughout the work at the end of each chapter.

The doctoral thesis is based on numerous theoretical and practical approaches to the economic concepts and phenomena studied, which, as a result of the applied research methodology, confirm the established research hypotheses.

An important added value is brought by carrying out the econometric study at the level of 11 developing countries, members of the EU from the Central and Eastern Europe area, which demonstrates the determining role of public investments on sustainable economic growth. The conduct of the study was based on the GDP, as an official and traditional indicator for measuring sustainable economic growth, after previously demonstrating the non-existence of a statistical link between public investments and the Human Development Index, one of the composite indicators proposed in the specialized literature as GDP alternative.

Final Conclusions and Personal Contributions

The research work aimed to complement the efforts made so far by specialists in the field in assessing the impact of public investments on economic growth and to make valuable contributions in the context of emphasizing the need for sustainable development. During the doctoral thesis, the conclusions and personal contributions and recommendations formulated following the analysis of the research objectives were presented.

Conclusions and personal contributions can be summarized as follows:

- ✓ The comparative analysis of the approached concepts that define the research, respectively sustainable economic growth, economic development and sustainable development, clearly differentiates these terms, often used, erroneously, as synonyms in the specialized literature. The conclusion resulting from the analysis supports the research hypothesis according to which sustainable economic growth is one of the constitutive elements of sustainable development.
- ✓ The evolution of economic thinking and the relationships or factors underlying economic growth are integrated into development strategies, but with new values added, such as sustainability for a more sustainable future. The systematization of economic theories reveals the differentiation and importance of endogenous economic growth models, which treat public investments as a determining factor of economic growth, as a starting point in proving the research hypothesis.
- ✓ The evaluation of the implications of the circular economy supported by public investments, although it generally shows positive effects on sustainable economic growth, confirming one of the research hypotheses, captures numerous ambiguities regarding the macroeconomic impact of the transition to the circular economy.
- ✓ It can be concluded that, in the implementation of the 2030 Agenda and its objectives, the

key role belongs to the central and local public administrations in each state, which exercise direct control in the management and use of public funds. Thus, in addition to stimulating collaboration and building viable partnerships between the public and private sectors, public procurement represents a significant instrument of public policy, through which the state, at the central and local level, can accelerate the strategic investments necessary for sustainable development.

- ✓ Public investment management constitutes the basic framework that links investment decisions and the budget process, as well as between investment projects and development strategies. The appropriate application of its principles and methods, especially through the correct performance of the Cost-Benefit Analysis, ensures an increased efficiency of public investments, which is reflected by a large economic and social impact.
- ✓ The analysis of the differences in the approaches regarding the evaluation methodology for the period 2021-2027 compared to the period 2014-2020 facilitates a faster understanding to support public decision-makers, in the context in which it has been shown that the cohesion funds provided by the EU through the Cohesion Policy represents the most consistent source of current financing for public investments. Thus, 57% of the cohesion funds intended to finance public investments were directed to Central and Eastern European countries during the 2007-2013 programming period, respectively 61% during the 2014-2020 period.
- ✓ Another important aspect highlighted refers to the evaluation of the need for co-financing provided by the cohesion funds, carried out through the financial analysis, respectively through the calculation of the VFNA (Net Financial Value Actualized) and the RRF (Financial Return Rate), in which case VFNA should be negative and RRF less than the discount rate used for the analysis. The project generates economic and social benefits when the NPV (Net Present Economic Value) is positive, RRE > RAS and the benefit/cost ratio > 1.
- ✓ Emerging economies encounter difficulties in procuring the financial resources necessary to make sustainable and resilient investments, caused by a more limited fiscal space and access to relatively short-term market financing, which can intensify the risk of debt crisis.
- ✓ The difficulties encountered in financing public investments can be aggravated by the political factor which, as a rule, acts in the distribution of funds under the influence of strong incentives, seeking immediate political gains. This phenomenon tends to exist especially at the local level, where financing possibilities are limited and investments can be divided and not satisfy the development programs of the local agenda. On the other hand, the prospects to deliver large infrastructure projects with co-financing from the government may be reduced,

due to the reluctance of the political factor to lose control over the investment, but also the instability of the political environment.

✓ The analysis of the sustainability of public investment financing shows a deterioration of the primary balance at the level of all Central and Eastern European countries in the period 2007-2021, reflecting the effects of the economic-financial and pandemic crises, visible through accentuated deficits that make it difficult to make public investments.

✓ An important step in the research is the review of the specialized literature relevant to the topic of the thesis. Thus, 50 studies examining the effect of public investments on GDP were reviewed and systematized, highlighting the applied methodology and their results.

Following the review process, the following conclusions were drawn:

- From a methodological point of view, two main approaches are distinguished: the first analyzes the contribution of public capital to economic growth through production functions, and the second follows the feedback effects of public capital growth on the economy by using the VAR model and other structural macroeconomic models;
- 54% of the reviewed studies report a positive and statistically significant relationship between public investment and economic growth, and 30% indicate a crowding-in effect of public investment on private investment;
- Public investment exerts a positive influence on economic growth and must be combined with private investment, having a stimulating effect in developing economies.

✓There is an international consensus on the inability of GDP to capture externalities such as environmental sustainability, income distribution and other factors with a strong influence on sustainable economic growth and quality of life. However, as a result of the existing disputes regarding alternative indicators, no agreement has yet been reached on the choice of an appropriate indicator that would meet these requirements and over time remove from the present advantages of using GDP.

✓A comparative analysis of the growth rate of real GDP and ANS was carried out, to highlight the extent to which the developing economies of Central and Eastern Europe are on the path to sustainable development. The result of the analysis shows that, in most countries, periods of economic growth were accompanied by positive net savings, suggesting an increase in social welfare. Also, a correlation was found between the HDI and GDP per capita, in the sense that the countries with the highest living standards (Slovenia, Czech Republic) register the highest degree of social and economic well-being, an aspect also confirmed from the sense opposite.

✓The empirical investigation of the effects of public investments on sustainable economic growth was carried out through econometric studies. Although most previous studies find that public capital increases productivity, in research on developing countries it is observed that in most of the countries in the sample, the long-run impact of a shock to public capital on GDP is estimated to be negative. The results of the conducted econometric study argue the following conclusions:

- In most cases there is a strong correlation between public and private investments, but causation cannot be determined;
- There is a bidirectional relationship between public and private investment, significant in the short term (stronger when using current values, i.e. without lags and leads);
- Private investment drives the business cycle, suggesting that large declines in real private investment can drive the economy into a recession. The effect of real public investments on real private investments manifests itself in the short term, which implies that they can be an effective tool for reducing the output gap;
- In developing countries, the public capital multiplier is positive at the beginning, and in most cases becomes negative in the medium term, while in developed countries the effect of public investment on sustainable economic growth is strong and positive in the short and medium term. The hypothesis of the research according to which ”public investments have a determining role in achieving sustainable economic growth” is thus validated.

The results of the study validate the main hypothesis of the research, confirming that public investments have a positive impact on sustainable economic growth. In developing countries, corruption, low government credibility and inefficiency of public investment may be explanatory factors for the negative multiplier effect of public investment in the long run. The results of the study support the positive contribution of public investments on sustainable economic growth, demonstrated in developed countries, where phenomena such as corruption are completely isolated.

Considering the conclusions and own contributions resulting from the research carried out, the following ***set of recommendations*** can be formulated:

✓ Highlighting the types of public investments on the pillars of sustainable development can be considered in the process of allocating financial resources and prioritizing public investment projects, so as to ensure a balanced distribution according to the real needs to achieve the SDGs.

✓ CBA continues to be an effective tool in the evaluation of projects, thus it is recommended to use it on a large scale and to adapt it by simplifying the evaluation methodology in accordance with the value of the investment, respectively a realization of the correlation of the values of the investments with the thresholds related to the legislated public procurement procedures.

- ✓ We believe that it is necessary to review the current fiscal framework as urgently as possible and redefine the fiscal rules, especially since they hinder the realization of public investments and discriminate this type of expenses in favor of current expenses. In this sense, in order to ensure an optimal level of public investments correlated with the SDG requirements, it is recommended to revise the fiscal deficit assessment framework by including a new indicator regarding the fiscal deficit target, which should be adjusted only with the value of those public investment expenditures for that the CBA has been carried out and the projects are declared economically and socially viable. At the same time, we appreciate that, in this way, inefficient investments that are not part of the basic infrastructure would be discouraged and would increase the accountability of political decision-makers.
- ✓ In order to increase the capacity of resistance and reaction in the face of crises, a better prioritization of public spending and allocations to health, education and public investment in real necessary infrastructure is recommended (medical, social care infrastructure, education, environment, etc.), to help overcome the effects of crises and tackle climate change.
- ✓ Starting from the premise that a single instrument for action and result should not be used, we recommend dividing and using indicators at government level into two major groups, as follows: decision/objective indicators, which have a solid theoretical and applied basis, and result/impact indicators, to evaluate whether the adopted strategies or decisions have achieved their purpose. It is obvious that GDP falls into the first category.

In conclusion, to achieve positive effects, good governance that delivers efficient, sustainable and resilient public investment and stimulates private investment is essential. Thus, decision makers need to ensure that the right projects are selected, delivered in a way that is environmentally sustainable, fiscally sustainable, cost effective, accessible, transparent, beneficial and useful to end users.

The Limits of the Research carried out in the Doctoral Thesis

The research work, although it brings added value in the studied field, through the topic addressed and the results obtained, is subject to the inherent limits of the research activity, among which the following have been identified:

- The research topic is vast and complex, which means that it cannot be addressed in all its dimensions within a doctoral thesis. Through the established objectives, sustainable development encompasses three different areas: economic, social and environmental. At the same time, the objective regarding sustainable economic growth (SDG 8) is defined by the accumulation of several sub-objectives and indicators, which aim at the labor market, the circular economy or tourism, making it impossible to treat these aspects in a unified manner within a doctoral thesis.

- Limits of the research, which come from the methodology used. Thus, in an econometric model, certain coordinates of the analyzed economic phenomenon are expressed, considered important, and the relationships between them are rendered in a stylized form. Therefore, there may be a residual area that can be quantified as a proportion, but which remains unknown.
- The study targets developing countries, but the sample is restricted to ex-communist countries in the central and eastern area of the European Union. Extending the research to more developing countries would help to generalize the results.
- The empirical research carried out focused on the GDP indicator, as a traditional and regulated measure of sustainable economic growth. Since it is known that GDP does not measure the sustainable characteristics of economic growth and there are several proposals for alternative indicators in the academic and political environment, an attempt was made to conduct the study with another indicator, of a composite type, the Human Development Index (HDI), but the lack of a link statistics between it and public investments, did not allow expanding the research by using a modern indicator.
- Limitations of the paper may come from the methodology used for the literature review, with the studies and reports reviewed coming mostly from the EU.
- It is possible that in the doctoral thesis certain aspects and interpretations have been affected by subjectivism or subject to omission.

These identified research limits, without being limiting, can be useful in establishing future research directions.

Future Research Directions

The complexity of the research topic, accompanied by the results obtained and the limitations identified, creates new personal challenges and future opportunities in research, such as:

- Elaboration of a composite indicator, which captures the dimensions of sustainable economic growth, based on simple, existing and globally monitored indicators.
- Carrying out the study with an alternative indicator to GDP, which would take into account externalities such as environmental sustainability and the general quality of life, would add value to the research. However, it is necessary to identify that indicator that

creates a statistical link with public investments.

- Carrying out an empirical research to assess for developing countries, where the growth potential is greater compared to developed countries, the contribution of other determinants of sustainable economic growth in the context of sustainable development.
- Evaluation of the contribution of the circular economy, supported by public investments, to sustainable development.

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