



TECHNICAL UNIVERSITY OF MOLDOVA

JOURNAL OF SOCIAL SCIENCES

Scientific publication founded on June 1, 2018

2022

Vol. V (3)

ISSN 2587-3490
eISSN 2587-3504

TECHNICAL UNIVERSITY OF MOLDOVA (PUBLISHING HOUSE)
„TEHNICA UTM” (PRINTING HOUSE)

Editor-in-Chief

Prof. univ. Larisa Bugaian

Technical University of Moldova

larisa.bugaian@adm.utm.md

Editorial Board

Ala Cotelnic, Dr. hab., Professor, Academy of Economic Studies of Moldova

Alexandru-Mircea Nedelea, PhD, Associate Professor, „Stefan cel Mare” University of Suceava, Romania

Alexandru Stratan, Dr. hab., Professor, Corr. Member of the Academy of Sciences of Moldova

Anca Păunescu, PhD, Professor, University of Craiova, Romania

Carmen Nastase, PhD, Professor, „Stefan cel Mare” University of Suceava, Romania

Gabriela Prelipcean, PhD, Professor, „Stefan cel Mare” University of Suceava, Romania

Georgeta Stepanov, Dr. hab., Professor, Moldova State University

Inga Stoianova, PhD, Associate Professor, Free International University of Moldova

Iuliu Turcan, PhD, Associate Professor, Technical University of Moldova

Larisa Bugaian, Dr. hab., Professor, Technical University of Moldova

Lilia Chiriac, PhD, Associate Professor, Technical University of Moldova

Ludmila Ungureanu, PhD, Associate Professor, Technical University of Moldova

Margareta Florescu, PhD, Professor, Institute of Advanced Research of the Academy of Economic Studies of Bucharest, Romania

Maria Gheorghita, Dr. hab., Professor, Technical University of Moldova

Nelly Turcan, Dr. hab., Professor, Moldova State University, Information Society Development Institute

Nicolae Samson, PhD, Associate Professor, “Gheorghe Asachi” Technical University of Iasi, Romania

Olivia-Cristina Rusu, PhD, Professor, Academy of Economic Studies of Bucharest, Romania

Rafael Ciloci, PhD, Associate Professor, Technical University of Moldova

Romeo V. Turcan, PhD, Professor, Aalborg University, Denmark

Svetlana Albu, Dr.hab., Professor, Technical University of Moldova

Svetlana Mira, PhD, Cardiff University, UK

Svetlana Caterenciuc, PhD, Associate Professor, Technical University of Moldova

Svetlana Gorobievschi, Dr. hab., Professor, Technical University of Moldova

Viorica Răileanu, PhD, Associate Professor, Institute of Philology, Republic of Moldova

Responsible Editor

Dr. hab. Rodica STURZA

Technical University of Moldova

Editorial Board address: jes@meridian.utm.md

Editorial Production:

Dr. hab. Aliona Ghendov-Moșanu

Dr. Nicolae Trifan

Dr. Țurcan Iuliu

Dr. Svetlana Caterinciuc

Dr. Rodica Cujba

Zinaida Stratan

According to the Decision of the NAQAER No. 15 from 26.02.2021, JSS is classified as
B+ journal

The Journal of Social Sciences is indexed in:

1. DOAJ (Directory of Open Access Journals)
2. ROAD (Directory of Open Access scholarly Resources)
3. CEEOL (Central and Eastern European Online Library GmbH)
4. INDEX COPERNICUS (IC)
5. ZENODO
6. ERIH PLUS (European Reference Index for the Humanities and the Social Sciences)

Main subjects areas of the Journal:

- Economics Policy and Economic Policies
- Economics and Management
- Finance and Accounting
- Marketing and Logistics
- Arts and Design
- Pedagogy and Psychology
- Sociology
- Philosophy
- History
- Philology and linguistics
- Law

How to publish a paper:

1. Send the manuscript and information about the author to the **Editorial Board address:**
jes@meridian.utm.md
2. Manuscripts are accepted only by e-mail, in template file (<https://jss.utm.md/>)
3. Articles are accepted in original language, with name, abstract and keywords in English.
4. After a review, you will be notified of the editorial board's decision.
5. After the Journal has been published, we will send it to you immediately by mail.

CONTENT

Monica-Laura Sorici (Zlati), Svetlana Mihaila, Veronica Grosu	<i>Approaches to the evolution of the social context through the lens of the social insurance budget effort in Romania. Realities and perspectives</i>	7
Nomazulu Sibanda, Vusilizwe Thebe	<i>South Africa's structural unemployment of women and youth: an analysis of the expanded public works programme model</i>	17
Muhammad Bukhori Dalimunthe, Bethlehem Efrata Sitanggang, Fitri Yani Panggabean	<i>The relationship between economic growth and poverty in Indonesia.....</i>	33
Titu-Marius I. Băjenescu	<i>What is social intelligence ?.....</i>	39
Ayobami Ademola Akanmu, Simeon Oluwagbenga Fasina, Umar Obafemi Salisu, Lukman Adedayo Adeyemo, Samuel Oluwaseyi Olorunfemi	<i>Socio-economic and environmental implications of roadside automobile workshops in Ota City, Nigeria.....</i>	48
Cristina Pavliuc, Alexandru Buga	<i>Democracy and economic growth: the case of Moldova.....</i>	71
Samuel Oluwaseyi Olorunfemi, Ayobami Ademola Akanmu, Umar Obafemi Salisu	<i>Government investment on road infrastructure in Kogi State, Nigeria: the impact on urban mobility.....</i>	88
Ion Bolun, Svetlana Ghetmancenco	<i>Efficiency indices of investment in it projects with equal lives</i>	105
Judicaël Alladatin	<i>The collaborative evaluation and co-design approach: prospects for effective solutions-innovations, epistemological foundations and implementation process</i>	121
Teodora-Valentina Lica	<i>Current state of knowledge in the field of financial performance analysis</i>	132
Zauwali Sabitu Paki, Shamsu Sani, Gambo Isah Diri	<i>Connection to the use of free Android apps in Kebbi State, Nigeria</i>	144
Iurie Badicu	<i>The dilemma of music industry development: external factors and internal trends.....</i>	155

Svetlana Cangas, Elena Florea-Burduja	<i>Digital revitalization of popular port products.....</i>	168
Marianna Savva	<i>Pupils attitude towards didactic career.....</i>	180
Resmen, Abdul Madjid, Faidzin Sulisty, Reka Dewantara	<i>The urgency of criminalization of bribery in the private sector as a criminal action of corruption in the corruption law.....</i>	188

CONȚINUT

Monica-Laura Sorici (Zlati), Svetlana Mihaila, Veronica Grosu	<i>Abordări ale evoluției contextului social prin prisma efortului bugetar al asigurărilor sociale în România. Realități și perspective.....</i>	7
Nomazulu Sibanda, Vusilizwe Thebe	<i>Șomajul femeilor și tinerilor din Africa de Sud: o analiză a modelului programului de lucrări publice</i>	17
Muhammad Bukhori Dalimunthe, Bethlehem Efrata Sitanggang, Fitri Yani Panggabean	<i>Relația dintre creșterea economică și sărăcie în Indonezia.....</i>	33
Titu-Marius I. Băjenescu	<i>Ce este inteligența socială?.....</i>	39
Ayobami Ademola Akanmu, Simeon Oluwagbenga Fasina, Umar Obafemi Salisu, Lukman Adedayo Adeyemo, Samuel Oluwaseyi Olorunfemi	<i>Implicații socio-economice și de mediu ale atelierilor de automobile din orașul Ota, Nigeria.....</i>	48
Cristina Pavliuc, Alexandru Buga	<i>Democrație și creștere economică: cazul Moldovei.....</i>	71
Samuel Oluwaseyi Olorunfemi, Ayobami Ademola Akanmu, Umar Obafemi Salisu	<i>Investiții guvernamentale in infrastructura rutiera in Statul Kogi, Nigeria: impactul asupra mobilității urbane</i>	88
Ion Bolun, Svetlana Ghetmancenco	<i>Indici de eficiență a investițiilor în proiecte it de durată similară.....</i>	105
Judicaël Alladatin	<i>Abordarea de evaluare și co-proiectare colaborativă: perspective pentru soluții eficacitate-inovații, fundamente epistemologice și proces de implementare</i>	121
Teodora-Valentina Lica	<i>Stadiul actual al cunoașterii în domeniul analizei performanței financiare.....</i>	132

Zauwali Sabitu Paki, Shamsu Sani, Gambo Isah Diri	<i>Conectare la utilizarea aplicațiilor Android gratuite în Statul Kebbi, Nigeria</i>	144
Iurie Badicu	<i>Dilema dezvoltării industriei muzicale: factori externi și tendințe interne</i>	155
Svetlana Cangas, Elena Florea-Burduja	<i>Revitalizarea digitală a produselor de port popular</i>	168
Marianna Savva	<i>Atitudinea elevilor față de cariera didactică</i>	180
Resmen, Abdul Madjid, Faidzin Sulisty, Reka Dewantara	<i>Urgența penalizării mituirii în sectorul privat ca acțiune penală a corupției în legea corupției</i>	188

[https://doi.org/10.52326/jss.utm.2022.5\(3\).01](https://doi.org/10.52326/jss.utm.2022.5(3).01)
UDC 316.6:369(498)



APPROACHES TO THE EVOLUTION OF THE SOCIAL CONTEXT THROUGH THE LENS OF THE SOCIAL INSURANCE BUDGET EFFORT IN ROMANIA. REALITIES AND PERSPECTIVES

Monica-Laura Sorici (Zlati)¹, ORCID ID: 0000-0003-2443-1086,
Svetlana Mihaila², ORCID ID: 0000-0001-5289-8885,
Veronica Grosu¹, ORCID ID: 0000-0003-2465-4722

¹Ștefan cel Mare University of Suceava, 13 Universității str., 720229 Suceava, Romania

²Academy of Economic Studies of Moldova, 61 B. Bodonii str., MD 2005, Chișinău, Republic of Moldova

*Corresponding author: Svetlana Mihaila, svetlana.mihaila@ase.md

Received: 05. 16. 2022

Accepted: 07. 05. 2022

Abstract. The social context in Romania is determined by the issue of the degree of social security, through the budgetary effort in a context of rising inflation and elements of geo-political instability manifested by recession and social insecurity, especially for the low-income population. The objective of the study is to identify the current situation affecting the social status of citizens in Romania and the prospects for its evolution by introducing a social security index based on statistical and econometric forecasting methods. The methods used are of an empirical nature represented by the study of the specialized literature and of an analytical nature, respectively the consolidation of databases, econometric modelling, prospective analysis and economic forecasts. The results of the study are useful for national decision-makers in order to adjust social policy elements in line with the sustainability objectives agreed at European level and in relation to the growing needs of the population at risk of poverty, continuing inflation and economic recession.

Keywords: *social protection, social security index, economic recession, social contributions, econometric model.*

Rezumat. Contextul social din România este determinat de problematica gradului de securitate socială, prin efortul bugetar într-un context de inflație în creștere și elemente de instabilitate geo-politică manifestate prin recesiune și insecuritate socială, în special pentru populația cu venituri mici. Obiectivul studiului este de a identifica situația actuală care afectează statutul social al cetățenilor din România și perspectivele de evoluție a acestuia prin introducerea unui indice de securitate socială bazat pe metode de prognoză statistică și econometrică. Metodele utilizate sunt de natură empirică reprezentate de studiul literaturii de specialitate și de natură analitică, respectiv consolidarea bazelor de date, modelarea econometrică, analiza prospectivă și previziunile economice. Rezultatele studiului sunt utile factorilor de decizie naționali în pentru a ajusta elementele de politică socială în conformitate cu obiectivele de durabilitate convenite la nivel european și în raport cu nevoile tot mai mari ale populației expuse riscului de sărăcie, inflație continuă și recesiune economică.

Cuvinte cheie: *protecție socială, indice de securitate socială, recesiune economică, contribuții sociale, model econometric.*

1. Introduction

In the broader macroeconomic context, the objectives of social policy at European level are to ensure social equity and equal opportunities with an impact on all sectors of activity by promoting social equality and protection of European citizens in relation to critical events (pandemic, economic crisis, unemployment, etc.). In the other direction, at the level of the Romanian national economy, which has adhered to the European objectives but from the point of view of social protection measures is somewhere below the European average, the economic status during the crisis period has made the social status vulnerable both by increasing unemployment and especially by increasing infancy which has reduced by about 30-40% the welfare of the population in the context of rising prices of utilities, energy and consumer goods.

On the other hand, fiscal policy aimed at reducing the budget deficit of 8% of gross domestic product (GDP) has not favoured the elements of social protection included in national strategies and policies. The vulnerable external environment and the domestic environment eroded by the recession manifested itself in the adjustment of the monetary policy conduct by the National Bank of Romania in a prudent manner, and the ROBOR (Romanian Interbank Offer Rate) continued its perpetual upward trend, making social policy even more vulnerable and accentuating the poverty of the population earning below the national average.

In this context, we define the following study objectives for the purpose of the study, i.e. the identification of a viable tool for the development of social security policies:

O1: identifying social security models in the literature or proposals for their improvement in crisis conditions;

O2: dissemination of working hypotheses based on results from the literature;

O3: building and strengthening the evidence base with relevant indicators to support modelling of social security status;

O4: defining the social security index;

O5: dissemination of the results.

The study continues with a brief presentation of the main approaches of the problems studied in the literature, with the presentation of the working methodology, the results and the conclusions of the research.

2. Literature Review

The specialized literature presents a series of interesting debates on the studied topic. The financial effort to cover the social need is at the forefront of the researchers, being recognized several models for assessing the effectiveness of allocations.

According to a study conducted by the European Commission [1] at the level of the European economy, social protection measures are approached differently, there are 3 cores, which show a constant allocation between 2005-2016, as follows: - countries such as Austria, Belgium, Denmark, Germany, France and Sweden [2-5], maintain a high level of allocation to social protection of the amounts collected to the general budgets of the Member States, with the mention that during this period other countries such as Italy and the Netherlands have changed their social protection policy and joined this core of high spenders.

The middle core of countries such as Portugal, Slovenia, Luxembourg [6-9], which were later joined by Spain, Greece, Croatia, maintain an average level of allocation.

The last core, characterised by a low level of allocations for social protection, comprises most countries: Bulgaria, Cyprus, Czech Republic, Estonia, Latvia, Lithuania, Malta, Poland, Romania and Slovakia, plus Hungary [2, 10-13] towards the end of the period.

The level of social protection [14, p.1] as a percentage of GDP, is for Romania about 50% of the European average, decreasing as a share in the dynamics between 2009 and 2016, so if in 2009, Romania allocates 16% of GDP for social protection measures, in 2016, the allocated level is 13.7% against 28.1% European average.

The real cost of social security is assessed by some authors [15, p.131] as the impact of property risk through the prism of financial security measures. A correct valuation of assets provides a measure of net liability, which in relation to the need for social protection partly ensures the liabilities of the system on contributions collected during the working life of citizens.

Another research [11, p.464] analyzes the trajectories of pension systems in Romania and Bulgaria over a period of 20 years, concluding that the Romanian pension system provides moderate social protection, being financed from social contributions collected at high rates, with a small investment component. The study suggests that under the impact of the crisis, pension systems are threatened by upstream accumulated budget deficits and the social security curve is shifting towards the deficit zone [16, p.612].

Other authors [17, p.90] identify as a future threat to the pension system the continuous reduction of the working population and the increase in the number of pensioners with negative effects on social protection budgets.

Economic convergence in the European Union (EU) [18, p.191] under the impact of economic crises is difficult to achieve. There are views at the European level on the introduction of cooperative relationships of European national economies, with the help of European governance interventions, thus the consequences on the social protection sector are significant. There is a division of Europe in terms of social protection [1, 14, 19], division that in the author's opinion is based on the economic capacity of European Member States, there are 2 clusters, that of developed and developing countries.

In a research conducted for the World Bank [20, p.1] the authors analyze the social dimension in dynamics, for the period 2012-2017, showing that social protection is a subject better covered than education or health. At the level of 2016 allocated 11.4% of GDP, while 2.8% allocated to education and 4.0% to health, the structure of social protection meeting the needs of the elderly, unemployed, parents and situations of temporary incapacity for work. In addition, social security in Romania extends to the protection of children and young people, as well as to poor families.

3. Materials and Methods

Starting from the public data reported at centralized level in Romania, we used the following main economic and financial indicators represented by: the total revenues of the general consolidated budget; the current revenues of the general consolidated budget; the capital revenues of the general consolidated budget; the total expenditures of the general consolidated budget; current expenditures of the general consolidated budget; the capital expenditures of the general consolidated budget; the surplus/deficit of the general consolidated budget expressed in millions of euro. The following demographic indicators:

Population aged 15 years and over, of which: active population, employed population, of which: employees, unemployed, inactive population aged 15 years and over (pensioners and social assistance recipients, pupils, students, homemakers) expressed in thousands of persons. Social security indicators: average monthly cost (EURO/employee) expressed in thousands of persons and insurance contributions to the general consolidated budget. The analysed period covered 2010-2020. We conducted an econometric model to determine the contribution correlation based on the least squares method and multiple linear regression using Statistical Product and Service Solutions (SPSS) software according to the formula:

$$InsuranceContribution^{\wedge} = \sum_{i=1}^{10} \alpha_i \cdot x_i \quad (1)$$

All abbreviations and explanations for mathematical formula showed in table 1:

Table 1

Abbreviations and explanations for mathematical formulas

Type	Abbreviations	Explanations	Unit of measurement
Dependent regression variable	InsuranceContribution [^]	The adjusted level of contributively expressed by the amount of social security contributions paid to the general consolidated budget	Millions of euro
Independent regression variables (Xi)	BTotallIncome	Total revenue of the general consolidated budget	Millions of euro
	BCurrentIncome	Current revenue of the general consolidated budget	Millions of euro
	BCapitalIncome	Capital revenue of the general consolidated budget	Millions of euro
	BCapitalExpenditures	Capital expenditure of the general consolidated budget	Millions of euro
	Bdeficit	The surplus/deficit of the general consolidated budget	Millions of euro
	15YOEmployedPopulation	Active population aged 15 and over	Thousands of persons
	15YOEmployee	Employees population aged 15 and over	Thousands of persons
	15YOUemployed	Unemployed population aged 15 and over	Thousands of persons
	15YOInactivePopulation	Inactive population aged 15 years and over (pensioners and social assistance recipients, pupils, students, homemakers)	Thousands of persons
	AverageMonthlyEmployeeCost	Insurance contributions to the general consolidated budget	EURO/employee
i		Number of regression variables	

Continuation Table 1

α_i	Regression coefficients
SSI	Social Security Index

By applying the linear regression modelling method, after calculating the unstandardized β coefficients, the model equation becomes:

$$\begin{aligned}
 \text{InsuranceContribution}^{\wedge} &= -0.687 \cdot \text{BTotalIncome} + 1.655 \cdot \text{BCurrentIncome} - 167.061 \\
 &\cdot \text{BCapitalIncome} - 0.382 \cdot \text{BCapitalExpenditures} - 0.079 \\
 &\cdot \text{Bdeficit} + 9.993 \cdot \text{15YOEmployedPopulation} - 6.782 \\
 &\cdot \text{15YOEmployee} + 9.289 \cdot \text{15YOUNemployed} + 1,672 \\
 &\cdot \text{15YOInactivePopulation} + 27576788.592 \\
 &\cdot \text{AverageMonthlyEmployeeCost} - 74529.627
 \end{aligned} \quad (2)$$

The model summary (Table 2) shows that there is significant statistical agreement between the dependent variable and the instrumented variables of the model, the authors applied the enter method for testing the validity of the data series, with the result that no variable was excluded.

Table 2

Summary of the econometric model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
SSI	1.000 ^a	1.000	1.000	0.000	1.000	0.000 ^b

Note: a. Predictors: (Constant), AverageMonthlyEmployeeCost, 15YOEmployedPopulation, Bdeficit, BCapitalIncome, 15YOInactivePopulation, BCurrentIncome, BCapitalExpenditures, 15YOUNemployed, 15YOEmployee, BtotalIncome; b. Dependent Variable: InsuranceContributions

The analysis of variance (ANOVA test) allows the validation of the alternative hypothesis and the rejection of the null hypothesis by applying the one-sided critical probability test in which the Sig coefficient is less than the value of the reference coefficient 0.005. The test results are shown in the below table 3:

Table 3

Application of the ANOVA method

	Model ^a	Sum of Squares	df	Mean Square	F	Sig.
SSI	Regression	230788698.182	10	23078869.818	0	0.000 ^b
	Residual	0.000	0			
	Total	230788698.182	10			

Note: a. Dependent Variable: InsuranceContributions; b. Predictors: (Constant), AverageMonthlyEmployeeCost, 15YOEmployedPopulation, Bdeficit, BCapitalIncome, 15YOInactivePopulation, BCurrentIncome, BCapitalExpenditures, 15YOUNemployed, 15YOEmployee, BtotalIncome

The proposed social village assessment model confirms that vulnerabilities propagate at the social policy level in tandem with group vulnerabilities that affect economic development as a whole, thus constituting a barrier to the operationalization of policies, to

the fruition of efforts to improve social status and to an accumulated welfare deficit of the Romanian population.

4. Results and Discussion

The diagrams made during the modelling show the variations in the form of clusters at the level of the period analysed in terms of income, these being situated in 2 clusters with a positive trend for the years 2011, 2014, 2019 and a decreasing trend for the years 2012 and 2020 according to Figure 1.

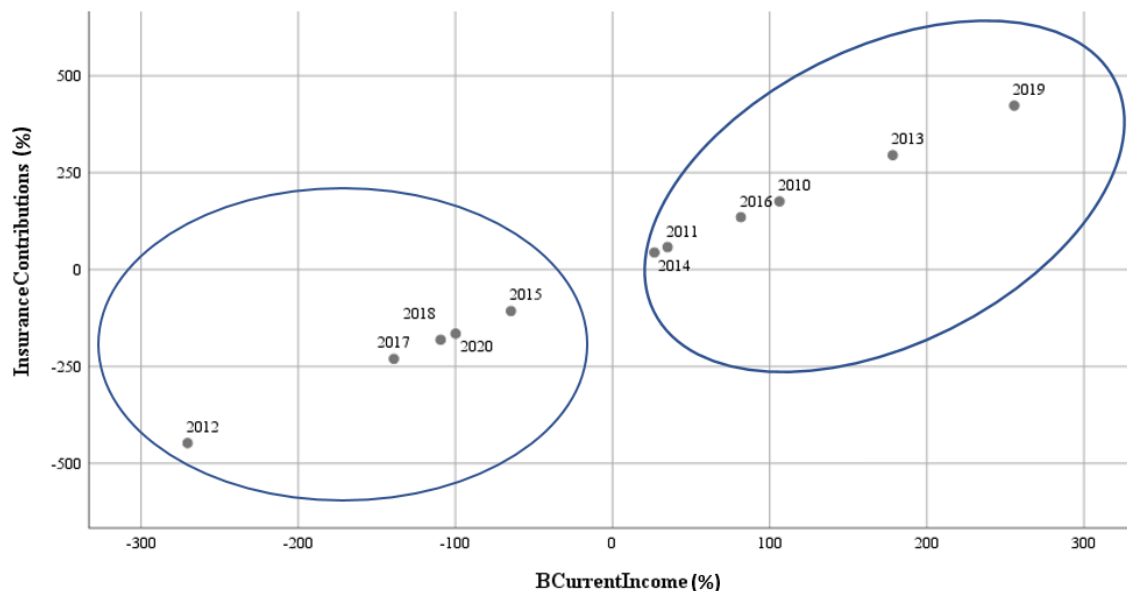


Figure 1. Partial correlation diagram of the dependent variable indicator InsuranceContributions in relation to the regressor BCurrentIncome during 2010 – 2020.

Source: Elaborated by authors.

The deficit policy has been similar throughout the period under review, with Romania consistently running a budget deficit as shown in the figure, which has worsened the social protection aspects.

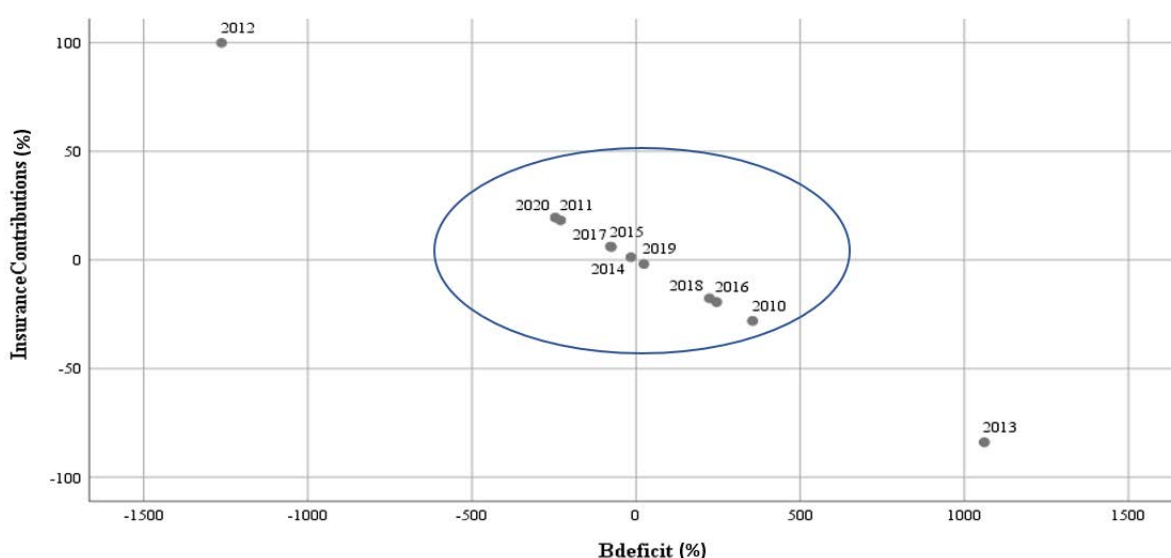


Figure 2. Partial correlation diagram of the dependent variable indicator InsuranceContributions in relation to the regressor Bdeficit during 2010 - 2020.

Source: Elaborated by authors.

At the level of personnel policy, there are significant influences at the level of three clusters, i.e. the deficit zone from the crisis years 2010, 2013, 2014 and a stability zone from 2017. The neutral zone is the one in the middle where the correlation with social protection reaches the median value of the interval.

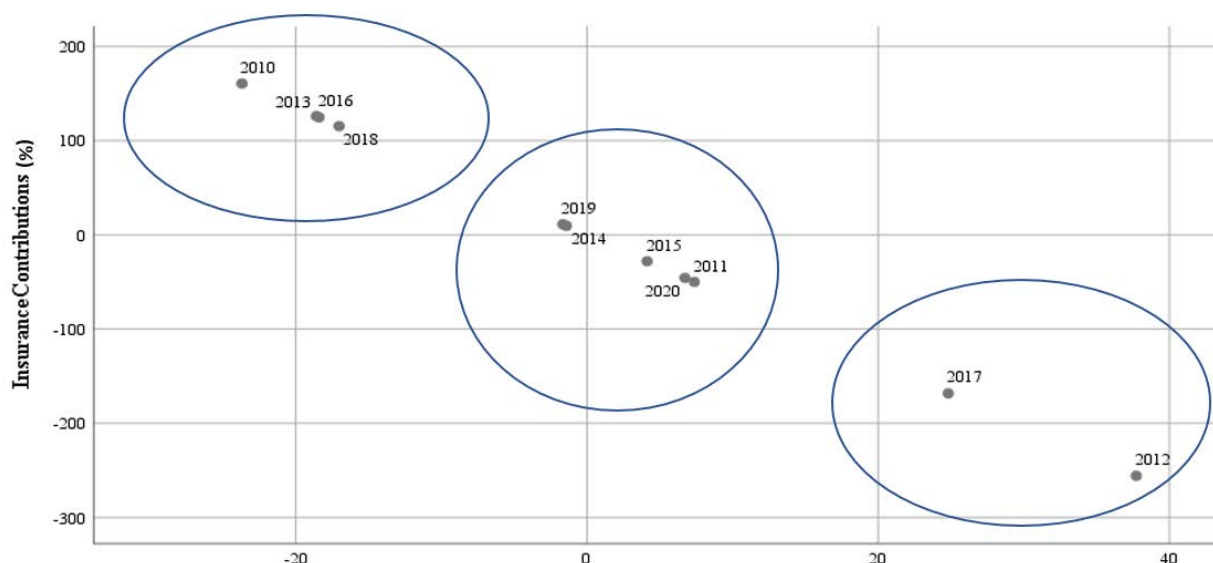


Figure 3. Partial correlation plot of the dependent variable indicator InsuranceContributions against the regressor 15YOEmployee during 2010 - 2020.

Source: Elaborated by authors.

Based on the Pearson correlation coefficients calculated during the modelling, we projected the social security index based on a multiplicative model as follows:

$$\begin{aligned}
 SSI = & 0.951 \cdot \frac{BTotallIncome_n}{BTotallIncome_{n-1}} \cdot 0.904 \cdot \frac{BCurrentIncome_n}{BCurrentIncome_{n-1}} : 0.306 \\
 & \cdot \frac{BCapitalIncome_n}{BCapitalIncome_{n-1}} \cdot 0.957 \cdot \frac{BTotallExpenses_n}{BTotallExpenses_{n-1}} \cdot 0.963 \\
 & \cdot \frac{BCurrentExpenses_n}{BCurrentExpenses_{n-1}} \cdot 0.932 \\
 & \cdot \frac{BCapitalExpenditures_n}{BCapitalExpenditures_{n-1}} : 0.542 \cdot \frac{15YOPopulation_n}{15YOPopulation_{n-1}} : 0.742 \\
 & \cdot \frac{15YOActivePopulation_n}{15YOActivePopulation_{n-1}} \cdot 0.202 \\
 & \cdot \frac{15YOEmployedPopulation_n}{15YOEmployedPopulation_{n-1}} \cdot 0.807 \cdot \frac{15YOEmployee_n}{15YOEmployee_{n-1}} : 0.91 \\
 & \cdot \frac{15YOUnemployed_n}{15YOUnemployed_{n-1}} : 0.356 \cdot \frac{15YOInactivePopulation_n}{15YOInactivePopulation_{n-1}}
 \end{aligned} \quad (3)$$

As can be seen, the value of the security index is sensitive to periods of uncertainty and an asymptotic evolution curve with a slightly increasing trend observed, characterized by the trend equation:

$$y = -0.0084 \cdot x^2 + 33.919 \cdot x - 34205 \quad (4)$$

By applying the formula the following structure of the security index is obtain for Romania for the period 2010 - 2020:

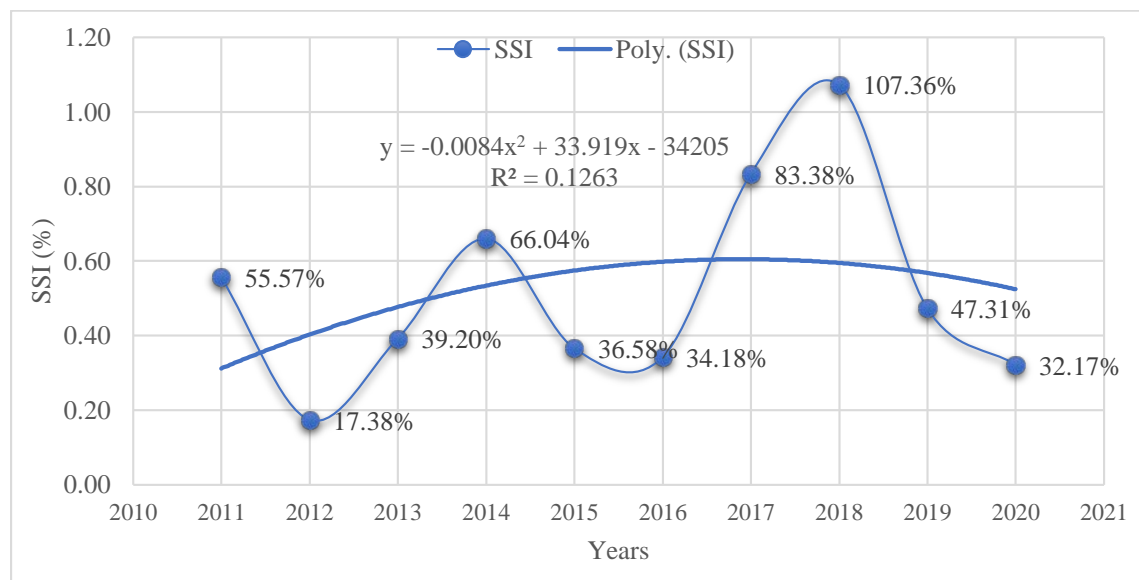


Figure 4. Structure of the social security index.

Source: Elaborated by authors.

From an observational point of view, the social security index represents a scale of social status manifested at the level of an economy, through its ability to reimburse citizens for security in times of welfare hardship and to guarantee welfare in times of economic growth. The proposed index is useful not only to x-ray social status but also to assess the efficiency and effectiveness of social security policies in relation to the objectives proposed by policy makers.

5. Conclusions

Through the conducted research, we achieved the study objectives, calculating the social status based on the multiple correlation ratio of the model indicators that were determined as valid and homogeneous with maximum and homogeneous statistical representativeness. We determined as a novel element of the study the value of the social security index that reaches after an oscillating evolution the maximum point in 2018 highlighting the vulnerability of the social status in relation to the elements of uncertainty and crisis in the economy.

The authors believe that the calculation of the index by policy-makers in making appropriate adjustments to social protection policies with a view to maintaining a higher level of social protection in times when the climate of uncertainty affects the well-being of citizens in particular.

The limitations of the study consist in applying the social security index only to the Romanian economy for a relatively limited period, only 10 years. The authors propose to extend the calculation of the index to other European economies with the application of the calculation formulas over a longer period in order to increase the relevance and improve the conclusions drawn.

Conflicts of Interest. The authors declare no conflict of interest.

References

1. Spasova, S.; Terry, W. Social protection expenditure and its financing in Europe. A study of national policies 2019, 1st ed.; European Social Policy Network (ESPN): Brussels, Belgium, 2019; pp 1-129, ISBN 978-92-76-08768-7, <https://doi.org/10.2767/145960>.

2. Radu, C.-P.; Pana, B. C.; Pele, D. T.; Costea, R. V. Evolution of Public Health Expenditure Financed by the Romanian Social Health Insurance Scheme From 1999 to 2019. *Frontiers in public health* 2021, 9(795869), pp. 1–11. <https://doi.org/10.3389/fpubh.2021.795869>.
3. Zlati, M. L.; Antohi, V. M. Analysis of Economic Efficiency through the Analytical Budgeting Method using Econometric Modelling. *Annals of the University Dunarea de Jos of Galati: Fascicle: I, Economics & Applied Informatics* 2018, 24(1), pp. 72–79. Retrieved from <https://doaj.org/article/48b1d11d1c84484dacc87fbab9a65c>.
4. Aiello, G.; Giovino, I.; Vallone, M.; Catania, P.; Argento, A. A decision support system based on multisensor data fusion for sustainable greenhouse management. *Journal of Cleaner Production* 2018, 172, pp. 4057–4065. <https://doi.org/https://doi.org/10.1016/j.jclepro.2017.02.197>.
5. Anzuini, A.; Rossi, L.; Tommasino, P. Fiscal policy uncertainty and the business cycle: Time series evidence from Italy. *Journal of Macroeconomics* 2020, 65(103238), pp. 1–14. <https://doi.org/https://doi.org/10.1016/j.jmacro.2020.103238>.
6. Remeikienė, R.; Gasparėnienė, L.; Fedajev, A.; Szarucki, M.; Đekić, M.; Razumienė, J. Evaluation of Sustainable Energy Development Progress in EU Member States in the Context of Building Renovation. *Energies* 2021, 14(14), pp. 1–22. <https://doi.org/10.3390/en14144209>.
7. Nolan, B.; Roser, M.; Thewissen, S. GDP Per Capita Versus Median Household Income: What Gives Rise to the Divergence Over Time and how does this Vary Across OECD Countries? *Review of Income and Wealth* 2019, 65(3), pp. 465–494. <https://doi.org/https://doi.org/10.1111/roiw.12362>.
8. Oprea, F.; Onofrei, M.; Lupu, D.; Vintila, G.; Paraschiv, G. The Determinants of Economic Resilience. The Case of Eastern European Regions. *Sustainability* 2020, 12(10), pp. 1–11. <https://doi.org/10.3390/su12104228>.
9. Bernd, R. Funding for public health in Europe in decline? *Health Policy* 2019, 123(1), pp. 21–26. <https://doi.org/https://doi.org/10.1016/j.healthpol.2018.11.014>.
10. Onofrei, M.; Cigu, E.; Gavriluta (Vatamanu), A.-F.; Bostan, I.; Oprea, F. Effects of the COVID-19 Pandemic on the Budgetary Mechanism Established to Cover Public Health Expenditure. A Case Study of Romania. *International Journal of Environmental Research and Public Health* 2021, 18(3), pp. 1–15. <https://doi.org/10.3390/ijerph18031134>.
11. Adascalitei, D. From Austerity to Austerity: The Political Economy of Public Pension Reforms in Romania and Bulgaria. *Social Policy & Administration* 2017, 51(3), pp. 464–487. <https://doi.org/https://doi.org/10.1111/spol.12173>.
12. Meyer, D.; Shera, A. The impact of remittances on economic growth: An econometric model. *EconomiA* 2017, 18(2), pp. 147–155. <https://doi.org/https://doi.org/10.1016/j.econ.2016.06.001>.
13. Bednářová, L.; Kiseľáková, D.; Onuferová, E. Competitiveness analysis of tourism in the European Union and in the Slovakia. *Geojournal of Tourism and Geosites* 2018, 23(3), pp. 759–771. <https://doi.org/10.30892/gtg.23312-326>.
14. Barrientos, A. Financing Social Protection. *Brooks World Poverty Institute Working Paper* 2007, 5(1204582), pp. 1–12. <https://doi.org/10.2139/ssrn.1204582>.
15. Blocker, A. W.; Kotlikoff, L. J.; Ross, S. A.; Vallenas, S. V. The True Cost of Social Security. *Tax Policy and the Economy* 2019, 33, pp. 131–163. <https://doi.org/10.1086/703231>.
16. Antipova, O. P.; Dmytryk, I. O.; Surzhenko, V. M.; Kudrya, I. G.; Tarasiuk, L. S. Modernization of the Paradigm of the Social State on the Example of the Countries of Eastern Europe During 2010–2019. *European Journal of Sustainable Development* 2021, 10(1), pp. 612–623. <https://doi.org/10.14207/ejsd.2021.v10n1p612>.
17. Bălăneasa, M.-C.; Dogotari, C. Some Reflections Regarding the Public Pension and The Number of Pensioners in Romania, in The Period 2010–2021. *European Journal of Law and Public Administration* 2021, 8(1), pp. 90–103. <https://doi.org/10.18662/eljpa/8.1/152>.
18. Jordan, J.; Maccarrone, V.; Erne, R. Towards a Socialization of the EU's New Economic Governance Regime? EU Labour Policy Interventions in Germany, Ireland, Italy and Romania (2009–2019). *British Journal of Industrial Relations* 2021, 59(1), pp. 191–213. <https://doi.org/https://doi.org/10.1111/bjir.12522>.
19. Halaskova, M.; Halaskova, R.; Prokop, V. Evaluation of Efficiency in Selected Areas of Public Services in European Union Countries. *Sustainability* 2018, 10(12), pp. 1–17. <https://doi.org/10.3390/su10124592>.
20. Inchauste, G.; Militaru, E. The Distributional Impact of Taxes and Social Spending in Romania. *World Bank - Policy Research Working Paper* 2018, 1(8565), pp. 1–51. <https://doi.org/10.1596/1813-9450-8565>.

Citation: Sorici (Zlati), M.-L.; Mihaila, S.; Grosu, V. Approaches to the evolution of the social context through the lens of the social insurance budget effort in Romania. Realities and perspectives. *Journal of Social Sciences* 2022, 5 (3), pp. 7-16. [https://doi.org/10.52326/jss.utm.2022.5\(3\).01](https://doi.org/10.52326/jss.utm.2022.5(3).01).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).02](https://doi.org/10.52326/jss.utm.2022.5(3).02)
UDC 351.71:331.5(680)



SOUTH AFRICA'S STRUCTURAL UNEMPLOYMENT OF WOMEN AND YOUTH: AN ANALYSIS OF THE EXPANDED PUBLIC WORKS PROGRAMME MODEL

Nomazulu Sibanda*, ORCID: 0000-0002-1824-632X,
Vusilizwe Thebe, ORCID: 0000-0003-1220-7458

University of Pretoria, Private Bag X20, Pretoria, 0028, South Africa

*Corresponding author: Nomazulu Sibanda, nomazulusibanda07@gmail.com

Received: 05. 18. 2022

Accepted: 06. 30. 2022

Abstract. This paper presents an analysis of the Expanded Public Works Programme (EPWP), one of the key South African government policy initiatives that are meant to ease the burden of poverty or unemployment on the poor and unskilled. Historically, such programmes have been used as a relief during short-term crises. Of late, countries have adopted them for long-term structural challenges. In South Africa the programme is meant to protect women and youth. This paper uses a mixed methodology approach to determine the active participation of women and youth in the EPWP and their chances of transitioning into the labour market. The study also solicited the views of the EPWP participants (active and former) and officials to get information which is not captured in the programme's official reports. The analytical procedure involved document analysis, focusing on EPWP reports from phases One (1) to Three (3) of the programme. The study makes two propositions: the need for public private partnerships to solve the country's unemployment challenge because independent policies for government or markets are inadequate; a new programme design which separates job seekers from social protection beneficiaries. In its current form, the EPWP is designed as a lower tier poverty trap.

Keywords: *Expanded Public Works Programme, Public Employment Programmes, Public Works Programmes, Unemployment, Women, Youth.*

Rezumat. Această lucrare prezintă o analiză a Programului extins de lucrări publice (EPWP), una dintre inițiativele cheie ale politicii guvernamentale din Africa de Sud, care sunt menite să ușureze povara sărăciei și șomajului asupra celor săraci și necalificați. Din punct de vedere istoric, astfel de programe au fost folosite ca ajutor în timpul crizelor de scurtă durată. În ultimul timp, țările le-au adoptat pentru provocări structurale pe termen lung. În Africa de Sud, programul este menit să protejeze femeile și tinerii. Această lucrare folosește o abordare metodologică mixtă pentru a determina participarea activă a femeilor și tinerilor la EPWP și șansele acestora de a trece pe piața muncii. Studiul a solicitat, de asemenea, opiniile participanților EPWP (activi și foști) și ale oficialilor pentru a obține informații care nu sunt surprinse în rapoartele oficiale ale programului. Procedura analitică a implicat analiza documentelor, concentrându-se pe rapoartele EPWP din fazele Unu (1) până la Trei (3) ale

programului. Studiul face două propuneri: necesitatea parteneriatelor public-privat pentru a rezolva problema șomajului din țară, deoarece politicile independente pentru guvern sau piețe sunt inadecvate; o nouă concepție a programului, care separă solicitanții de locuri de muncă de beneficiarii de protecție socială. În forma sa actuală, EPWP este conceput ca o capcană a sărăciei de nivel inferior.

Cuvinte cheie: *Program extins de lucrări publice, Programe de ocupare a forței de muncă publice, Programe de lucrări publice, șomaj, femei, tineri.*

1. Introduction

South Africa's unemployment challenge has a long pedigree, dating back to the apartheid era; it was first classified along racial lines, with previously disadvantaged races bearing the brunt, and of late women and youth feel its impacts even more. Like other African countries, the country struggles with unemployment rates that are high among the youth and other vulnerable groups [1-3]. Generally, the country has consistently recorded a growing unemployment trend. In the fourth quarter of 2021, the country recorded 35.3 % unemployment, translating to 7.9 million people, albeit based on a narrow definition of unemployment [4]. Women and youth unemployment was the worst, with 37.3% of women compared to 32.9 % of men, while youth unemployment (for 15-24 years and 25-34 years age groups respectively) reached 66.5 % and 43.8 % in quarter three (3) of 2021 [5]. The country's unemployment levels are also dominating among the South African Customs Union (SACU) member states. In 2019, women unemployment in South Africa was highest at 30.5 %, with Lesotho ranking second highest at 28.13 %, the Kingdom of Eswatini coming third at 23.9 %, Botswana fourth at 20.51 % and Namibia ranked fifth at 18.53 % [6]. While youth unemployment is also said to be the highest among the SACU member states at 57.5 %, followed by the Kingdom of Eswatini at 46 %, Namibia at 37.8 %, Botswana 35.6 % and Lesotho coming in last at 34.4 % [7].

Many reasons account for this challenge, such as population growth, poor economic growth and the economic restructuring which has led to a rapid shift towards highly skilled labour, leaving many unskilled people out of the labour market [8-9]. The agriculture and mining sectors, which are the main absorbers of unskilled labour have experienced severe decline while in contrast the sectors that include services, finance, business, wholesale and retail, which require specific skills, have grown significantly [10-11]. The challenge of structural unemployment and skills shortage in South Africa is amplified by skill requirements of the recent Fourth Industrial Revolution (4IR). The 4IR, has significantly altered the way which people live and work, thereby thrusting the young people to the forefront of development [12] but there has been a shift too in skills required. Anxious to create an all-inclusive South Africa, the government initiated several policy interventions dating back to the end of apartheid era, all of which had specific targets for solving the country's unemployment challenge. In their diverse versions, these interventions privilege the need for education and training and labour absorbing growth [13-14].

It was in this context that the government introduced a Public Employment Programme (PEP) known as the Expanded Public Works Programme (EPWP) in 2004 as a short to medium-term relief strategy to address the country's unemployment challenge [15-17]. The genesis of this programme was in the mid-1990s when it was first implemented as the Community-Based Public Works Programme (CBPWP) which utilised labour-intensive approaches to build community assets and local capacity, thereby creating short-term

employment to cushion the poor and unemployed [18-20]. The EPWP is a five (5) yearly phased programme aligned to the broader government policy initially linked to the Reconstruction and Development Programme (RDP) of 1994 and currently to the current government development blueprint, the National Development Plan (NDP) adopted in 2012 [18, 20]. The programme's aims are now focused on social protection, creation of assets and employment opportunities for poor and unskilled [21] with more emphasis being placed on employment of vulnerable groups. The country's unemployment especially for women and youth is worrying to government, civil society, communities and other stakeholders. This is despite government efforts to curb it. This article aims to analyse how the EPWP is responding to this challenge. In pursuing this, the paper aims to seek answers to the question on how the programme addresses the country's structural unemployment problem among the women and youth population categories in post-apartheid South Africa.

Grounded on the Keynesian model, PEPs or Public Works Programmes (PWP) have a long pedigree as a short-term crisis-employment policies. They have been employed by both developed and developing countries in response to a number of crises. Dating back to the 19th century, when India (known then as British India) responded to successive droughts in the 1830s, 1870s and 1890s where through labour-intensive methods, a PWP was used to protect victims of famine [22-23]. Later on, countries like the United States of America (USA) during the Great Depression in 1934, East Germany during an economic crisis after the fall of the Berlin Wall, Argentina during the 1998 to 2002 economic crisis and Ethiopia have also used these programmes [22-27]. It is in the same vein that South Africa also introduced the EPWP in 2004, targeting the poor and unskilled to provide temporary employment relief to the unemployed while reskilling the unskilled or semi-skilled [15-16, 27]. However, globally such programmes are not recognised as active labour market policies because, in their nature, they are designed to provide temporary employment relief. Of late, some countries have innovatively used these programmes to address long-term challenges thus, changing the underlying philosophy of short-term crisis relief, bringing a new dynamic to the labour market arena [25, 27]. This has been the case with the EPWP which has become the next best alternative for the unemployed in South Africa [28-29]. This places a significant responsibility on the programme as opposed to it being a complementary employment programme.

This article, employed a mixed methodology with primary data collected through structured and semi-structured interviews, supplemented with secondary data on EPWP and general labour market reports. Through analysis of lived experiences of active and former EPWP participants, this article aims to contribute literature on how PEPs or PWP can effectively be used by countries to solve long-term challenges. Specifically, in the developing world where challenges are not short-term crisis oriented but have become a part of the daily lives of many ordinary citizens with significant bias towards vulnerable groupings such as women and youth. This article is divided into five (5) sections. The first section includes the background of the study and the research questions. The second section discusses the materials and methods used in the collection of data. The third sections discusses results. Discussions follow in the fourth section and then section five (5) concludes the study.

2. Materials and Methods

Social issues are complex, so is the unemployment challenge in South Africa. Whereas some sources argue that women and youth have taken centre stage in leadership, the economy and on the labour market [30-31], there is hard evidence to the contrary. This article

adopted a robust approach for a complete understanding of the EPWP and how it relates to the protection of the vulnerable in the country. The study employed both qualitative and quantitative data collection and analysis methods which consisted of primary as well as secondary data. The two approaches complement one another in how data is generated and analysed. The former which consisted of structured and semi-structured interviews was collected from 224 (active and former EPWP participants) in Kimberley and Kuruman in the Northern Cape as well as 30 EPWP officials in Kuruman, Kimberley and Pretoria (EPWP Head Office). The latter consisted of document analysis and quantitative data in the form of documented statistics. The data was analysed using graphs and tables as well as thematic presentations. Quantitative data was first collected from the field through surveys using structured questionnaires. Some qualitative data was collected from secondary sources such as EPWP, labour market and media reports. From this data, key issues were identified. Semi-structured interviews were held with a small sample of participants or former participants and EPWP officials to clarify issues identified as requiring follow up. In order to elicit sufficient understanding on how EPWP has responded to these challenges, this article strove to deploy these investigative constructs in the field [17, 32-34]. A single method does not allow for sufficient investigative depth and breadth on the critical drivers of unemployment among women and youth in South Africa.

3. Results

South Africa suffers from structural unemployment, which means those without skills need employment alternatives. Government continues to emphasise creation of EPWP employment as a complement to efforts by labour absorption institutions and job creation by the private sector [35]. The programme is perceived and understood as a temporary relief to the unemployment challenge. Questions abound on the extent to which the programme has managed to provide this relief especially to women and youth.

3.1 EPWP employment is too small to provide the country's much needed relief

EPWP employment opportunities are very low compared to employment required by the unemployed in the country. Figure 1 shows that in 2008, the country had over 4 million unemployed people, and in just over 10 years, unemployment shot up by 50% to 6.1 million people in 2018.

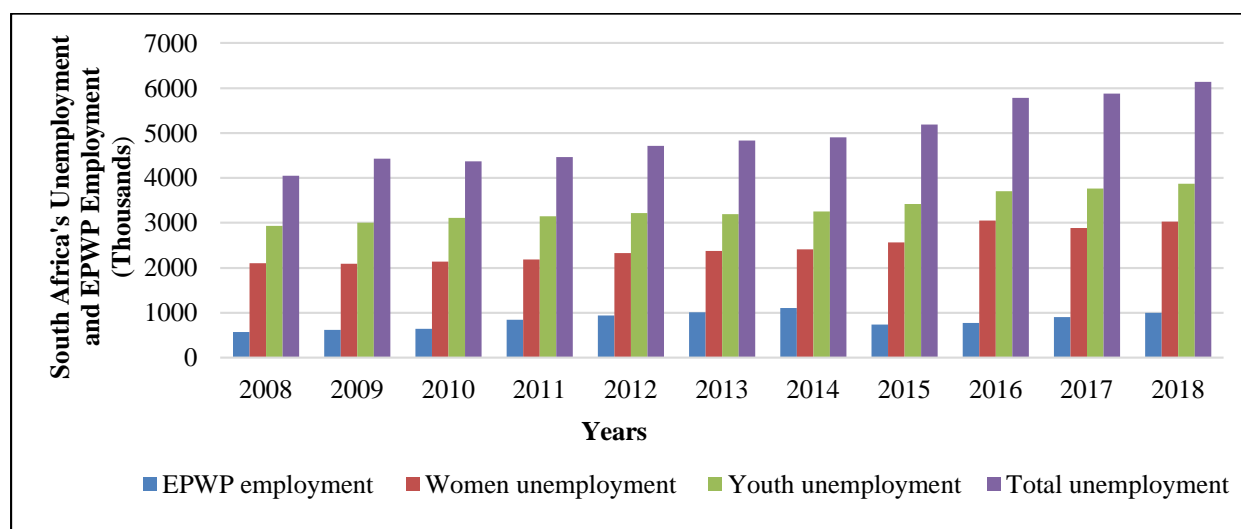


Figure 1. South Africa's unemployment and EPWP employment [36-37].

These numbers reflect the official definition of unemployment, meaning that in the broad definition, the number of unemployed people is substantially much more than what is reflected.

As shown above, the EPWP created 570,019 jobs in 2008 compared to over 4 million people who required employment in the same year. The EPWP employment levels have ranged between 14% and 22% of the unemployed throughout the three (3) phases of its implementation. The 4.5 million jobs target for Phase Two (2) or 6 million jobs target for Phase Three (3), which were for the full five-year period of each phase (Department of Public Works, 2019) are equivalent to all the jobs required in the country annually. Poor project administration was identified as a challenge leading to poor creation of employment opportunities on the programme. Of the EPWP officials who took part in the survey, 41% said that jobs are created but are not reported due to poor administration. Employment created is reported on the EPWP reporting system. A report on EPWP by the South African Cities Network stated that, "...changes to the reporting system requirements made in 2015/16 led to data relating to projects being non-compliant and so projects and work opportunities created could not be reported" [38, pp.43]. As a result, some data was discarded because it is unreliable thus losing track of work opportunities created. The other reason given for this is the lack of capacity in government. This was a view by one EPWP official who said:

Government does not have capacity to implement infrastructure projects, some unit heads are former educators who have no knowledge of the construction sector, so some projects cannot be implemented [39].

The gap between the number of jobs created by the EPWP and the levels of unemployment is too wide; hence, there have been calls to expand the programme in order to absorb more jobless people [15, 28]. The need to expand the programme was also echoed from within the programme with one EPWP official emphasising it saying:

There was a need to table a policy framework in parliament that makes it compulsory for public sector projects to have EPWP component [40].

It was suggested in the parliamentary debates on 14 February 2019 that the programme should roll out large infrastructure projects that could then absorb the unemployed [35]. This comes as no surprise as the unemployment question has become a major policy issue, and the government is hard pressed to create more jobs. However, there are several austerity measures designed to reduce state the fiscal burden introduced from 2014/15 financial year with one of the consequences being a reduction on social spending and cuts on infrastructure grant allocations [20]. The infrastructure grants are the funds that public bodies use to create EPWP employment. Reduction of these grants cripples the programme's expansion potential. If the programme is to expand, it has to do so within the government's constrained fiscal purse. This was supported by one EPWP official who said:

Our budgets are cut and EPWP work opportunities are not revised according to budget cuts. We end up reprioritising projects and in the end people we are supposed to employ end up not getting the opportunity [41].

This was supported by 17.6 % of the EPWP officials who took part in the survey who said budget cuts are a major impediment to growth in creation of employment opportunities by public bodies.

One the other hand, the unemployed felt the pressure to remain working on the programme because it is difficult to get work elsewhere. For example one EPWP participant, Nolwazi, a 31-year-old woman from Gamothibi village, who has never had a permanent job in her life and is currently working in a community garden with eight other people from her village sees the EPWP as a welcome relief from her unemployment plight. She said that she has an incomplete matric certificate and the EPWP is the only employer in her village. She, however, complains that EPWP opportunities are limited as only a few people can work on the programme at each specific time. When other people apply through the Non-Profit Organisation (NPO) office that is responsible for implementing the programme in her village in Kuruman, they are usually told that there is not enough budget to take on new participants. They are advised to wait for the following year as the budget is likely to be increased. She said there are two women who joined her group in 2018 after waiting for three years to be included among EPWP participants. While they were waiting for the purported budget increase, they had no work to do since there are no 'skrops' (part time jobs) in the village. She found this situation very frustrating. This view was shared by an EPWP official who said:

Programmes like the EPWP are key to fulfilling the government's promise to create employment, and this can be done through increased budgetary support to the programme to facilitate expansion [39].

These job opportunities are needed by the communities but budgetary constraints are frustrating the intended programme outcomes of protecting the poor and unemployed.

3.2 The EPWP projects offer limited employment options

There are not many employment opportunities so the EPWP has become what [28] termed 'an employer of last resort'. The unskilled or semi-skilled have to look for an EPWP opportunity. Women appreciate EPWP work due to limited options. For example, Keneilwe, a 38-year-old woman from Greenpoint Township in Kimberley who currently lives in an RDP house with her three children, parents and four siblings feels the impact of high unemployment levels in the country. She appreciated working for the programme because there is no other option for her. She said:

it is difficult to find work especially here in Kimberley...when they built the Diamond Pavilion Mall we were hoping we are going to get work there as shop assistants but some of us failed. Most girls in my area who dropped out of school have two or more children and end up doing this 'vat en sit' thing (meaning unmarried couples living together). Life is not normal here. We really need work [42].

Keneilwe does not have any formal skill and the only work experience she had was working as a housekeeper at a hotel in Kimberley on a short-term contract. She had never had a permanent job in her life and was in need of permanent work. She had joined the EPWP about five years prior and worked on a street paving project in Greenpoint Township. She said:

I was happy when the Deputy President (meaning Mr. Ramaphosa who is now President of the country) visited our project in 2015, I thought we were going to get permanent jobs after seeing the good work we had done. That did not happen because we are still relying on EPWP for work [42].

At the time of the interview, Keneilwe was now working on a street cleaning project in Kimberley. Similar to Keneilwe's situation, young people who have failed to make it in the labour market resort to the programme for employment. For example, Kealagile, a 31-year-old male from Glenred Village who matriculated in 2008 but failed to get the required subjects to proceed to tertiary education and then went to the farms in the Western Cape

Province to find work, is grateful for working on the programme. Since remuneration is very low on the farms and the work is seasonal, he reports that he found life unbearable and therefore decided to go back home. Unfortunately, in his village there is no employment opportunities save for the EPWP projects. He said:

in 2012 I decided to go back home and I was employed as a supervisor on an EPWP project where I earn R2,500 per month [43].

According to Kealagile, unemployment is a challenge in his village and the unskilled rely on EPWP work. The only job opportunities in his village are government jobs in teaching, agricultural extension services, nursing or within the police force in Bothitong Village which is about 15 km away. The fortunate ones get work in Kuruman, about 70km from his home. The EPWP employment is necessary in these areas to cushion the poor and unemployed from the adversity of joblessness.

3.3 Some the EPWP sub-programmes employ youth better than others

The programme has managed to create sub-programmes that are able to absorb women, with the Social sector employing women at 82%, the Non-state sector employing 78% women within the CWP, and NPO employing 74% women as shown in Figure 2. One EPWP who praised the programme for providing work opportunities for women said:

the introduction of the non-state sector in 2009 saw a rise in the employment of women on the programme. The general rise in the sub-programmes favouring women such as school nutrition, home based care and some sub-programmes from the NPO and CWP have promoted this growth [44].

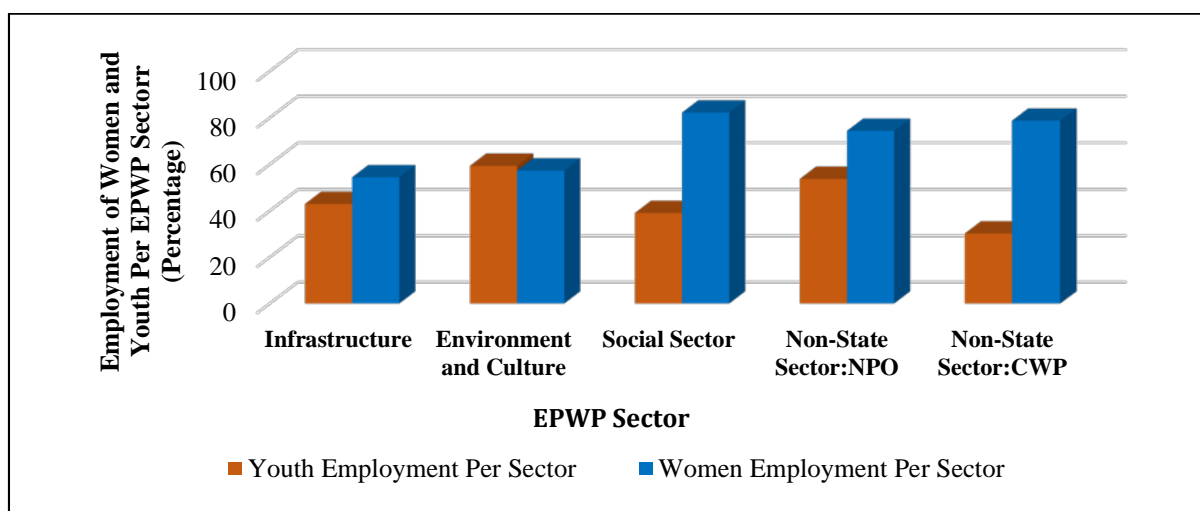


Figure 2. EPWP employment of Women and Youth per Sector in 2019 [36].

On other hand, the programme has been struggling to draw the attention of youth to its programmes. This is evidenced by low participation of young people despite their high levels of unemployment. As shown in Figure 3 youth absorption ranged from 30% to 59% in 2019. Young people view EPWP work as degrading according to Mercy's observation. Mercy is a 34-year-old woman who is a supervisor on an EPWP project in Veregenoenrg Township. Mercy said:

they (referring to youth) take it as old people's job...the ones we started with resigned and looked for other jobs [45].

The EPWP provides employment but some young people feel that the work done on the programme is not decent enough for them. However, one of the reasons given by EPWP officials who took part in the interviews is that in some cases, young people do not meet the minimum requirements for certain sub-programmes. The EPWP officials said: “*it’s not easy to get learners with Maths and Science*” [46]. This is one of the minimum requirements for participating in the NYS sub-programme, and without such credentials, then the National Youth Service (NYS) sub-programme cannot assist.

3.4 EPWP produces poor quality of labour

People employed on EPWP projects are expected to find their way into the formal labour market. A distinguishing factor of EPWP employment is that it is project-based and most projects are of short-term duration. In addition, the level of effort required across different projects varies, with some people having much heavier workloads compared to others [28]. The quality of labour is determined by time spent at work, work experience gained from projects, EPWP activities and mobility within projects. Quality of labour takes into consideration the type of work experience that EPWP participants gain from the programme, which is also critical if they are to be gainfully employed. The EPWP participants are trained as general labour across all trades. One EPWP official said:

our EPWP participants do everything. We give them any task that is available, all they want is to get a stipend [39].

Data from the EPWP participants indicate a certain trend in the work experience of EPWP workers as shown in Figure 3. They tend to have work experience that is so diverse that there is no discernible growth in the skills each of the components contribute to the participant.

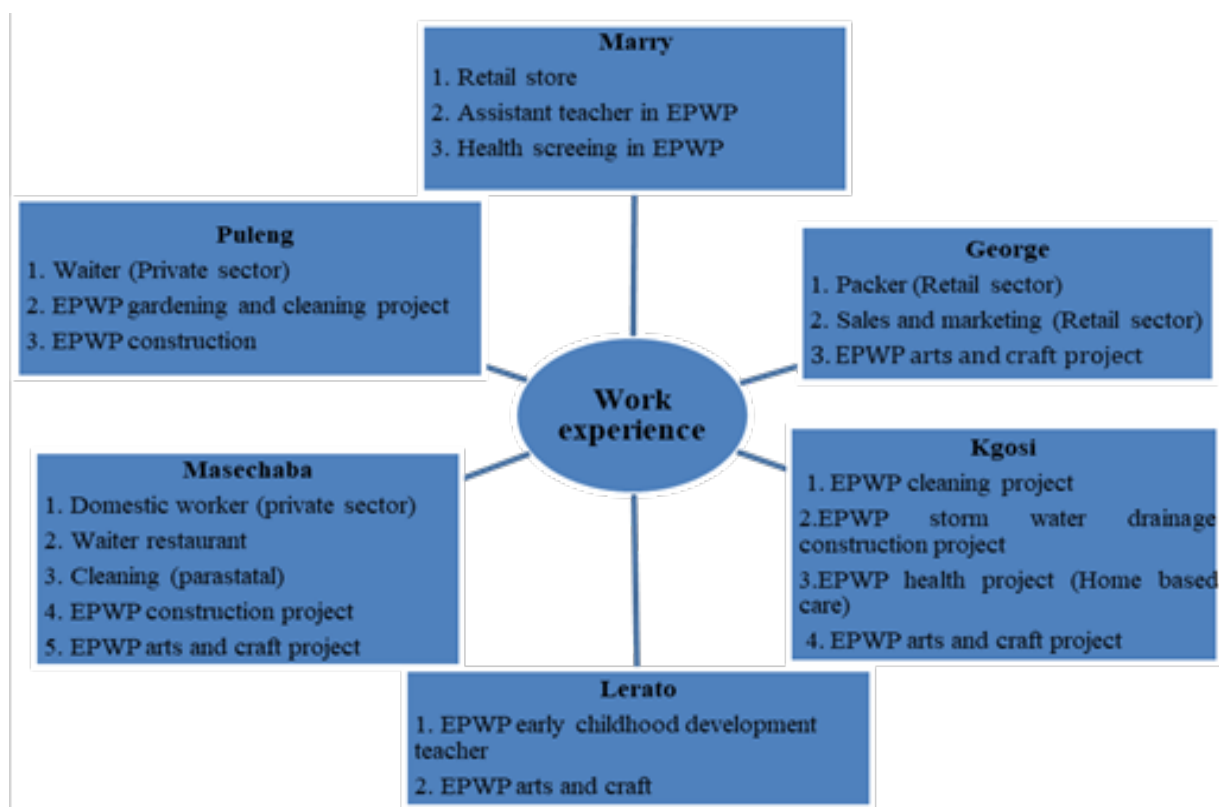


Figure 3. EPWP participants work experience.

The respondents cited in Figure 3 have work experience from either the EPWP and private sector or the EPWP only. Most EPWP participants have work experience from more than one sector of the EPWP. It is difficult to draw a career path, for example, for Kgosi from Greenpoint Township, who has more than three years' work experience from the EPWP only. In the three years that Kgosi has spent on the EPWP, he has worked in all four sectors of the programme. When he started working on the programme he was in an Environment and Culture Sector project responsible for street cleaning. In the same year, he dropped out of the cleaning project to join the Infrastructure sector, where he was involved in the construction of storm water drainages as a general labourer. This was a short-term, 6-month contract. When this contract ended, he joined the home-based care project in the Social sector where he worked for a year. He again dropped out to join an arts and craft project in the Non-State sector. Kgosi, therefore, has had short stints of work experience in unrelated activities. Kgosi's work history seriously impairs his chances of convincing a potential employer who is looking at his profile that he can do a particular job as he has not had extended experience in any particular sector or industry.

Another similar case is that of Masechaba from Roodepan Township who has more than five (5) years of work experience having worked in the private sector and on EPWP projects. She has worked as a domestic worker in the private sector, cleaner in a parastatal, waiter in a restaurant, involved in construction in the EPWP, and was now working for an arts and craft project in the EPWP. The first three (3) jobs are related, but she found herself in a construction project as well as an arts and craft project when she joined the programme, taking a totally different career direction altogether. This puts Masechaba in the same dilemma as Kgosi. These are typical cases of most EPWP participants, with some having worked in almost all sectors of the programme and therefore making it difficult to place them in any one sector of the economy.

3.5 EPWP causes displacement or substitution of full time workers

The EPWP workers have become low cost workers in some government institutions, in the process displacing or substituting full-time workers. For example, Annelia, a 33-year-old female from Glenred Village, who works on an EPWP project assisting at a local school as a receptionist and is also responsible for cleaning of staff rooms as well as the principal's office, expressed concern about this. She said she had been doing work that was supposed to be done by full-time staff for about two years. She works with three other people, two women and one male, who are all youth. Annelia earns R780 per month working two days a week. Some EPWP participants in other parts of the country have turned to industrial action demanding that they be employed permanently in such positions. About 62 % of EPWP participants from the field data indicated that they were working on a short-term project while 38 % indicated that they were doing work that is supposed to be done by permanent staff. Some labour representatives have called for a stop in this exploitative practice of using EPWP participants in key service delivery government functions [47-48]. The political leadership has also called for an end to this practice by government institutions, with the National Assembly having reiterated this towards the end of Phase Three (3) during a parliamentary debate on the EPWP [35].

3.6 The EPWP programme support structure is weak

The EPWP's support structure is fragile because it mainly depends on the government sector, which in many cases has its own pre-existing performance challenges as identified by

the Auditor General South Africa [49]. Government is highly criticised for failing to provide the necessary public goods and services to the communities which has seen a rise in service delivery issues over the years. Since EPWP is delivered through this model, it is also caught in this trap of long standing issues which government has not been able to resolve over the years. This has been a norm in government where local government is the worst spender among public bodies implementing the EPWP, with the 2018/19 financial reports showing underspending of 13% on municipal budgets and conditional grants [50]. This is supported by EPWP data on expenditure from 2008 to 2019 in Figure 4.

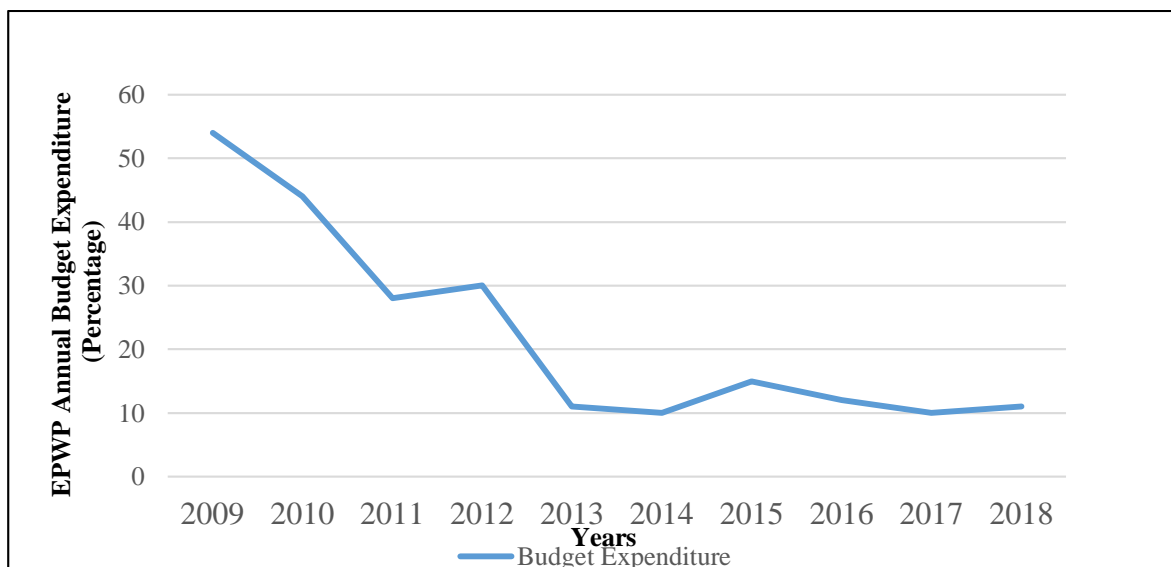


Figure 4. Reported EPWP Annual Budget Expenditure [36].

Figure 4 illustrates expenditure on projects as reported on the EPWP reporting system from Phase Two (2) to Phase Three (3). As illustrated above, the programme was only able to spend over 50% of the allocated resources only once in the 10 years of implementation. In 2009, when the Non-State Sector was introduced, the programme managed to spend 54% of the allocated resources. From 2013, the programme has consistently spent less than 20% of the allocated resources. This emphasises the point that as much as the Keynes approach to government intervention is necessary, government alone is not able to effectively provide the much-needed relief to the economy hence the need to involve the private sector. There has been suggestions of inclusion of private sector as proposed in the programme's initial framework of 1992 which have not materialised [38]. Unfortunately, the programme has been entangled in this government web of poor performance which has been normalised within government structures.

4. Discussion

This article focuses on the alleviation of long-term challenges through implementation of EPWP in South Africa with specific focus on its ability to cushion the vulnerable (women and youth). It remains critical to ask whether the desired outcomes of EPWP were incorporated in its design. Due to the complexity of the programme and the challenge at hand, understanding the underlying assumptions is crucial to explaining these programmes [32,51]. This also enables one to be able to draw linkages within the ecosystem.

Figure 5 illustrates PEPs or PWP assumptions. Its ecosystem consists of stakeholders (who provide projects and policy guidance) and the participants (poor and unskilled looking for employment opportunities).

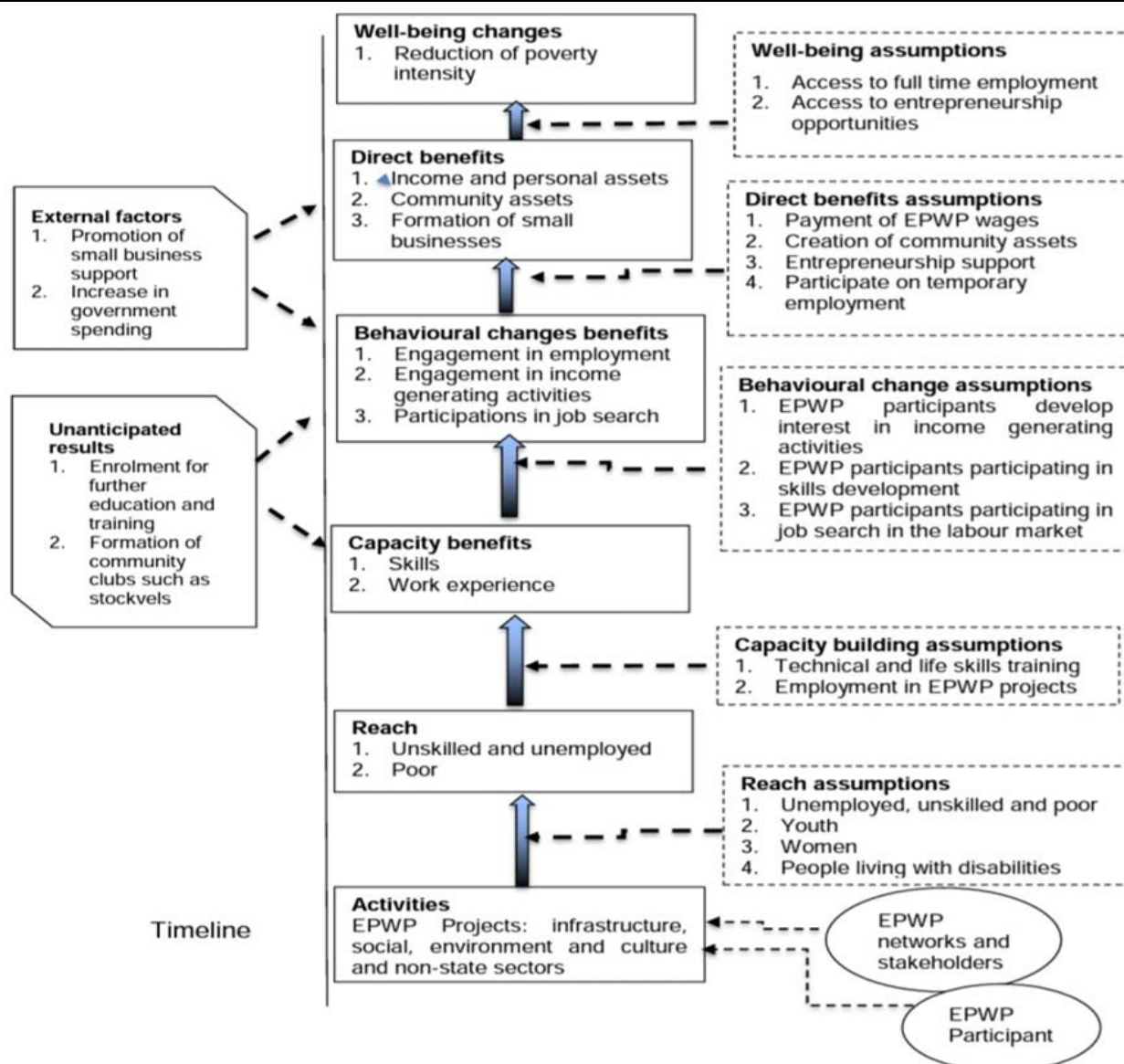


Figure 5. Programme model [32, 51].

This model makes assumptions that the programme reaches the targeted beneficiaries, while on the programme participants receive capacity building, it also assumes that participants behavioural changes (job search, entrepreneurship participation and skills development).

By participation on the programme participants are said to receive direct benefits such as temporary employment, wages, community assets and entrepreneurship support. In the end there is well-being changes in the form of reduction of poverty intensity. There are some unanticipated outcomes such as enrolment into further education or training and participation in savings clubs. These assumptions shape the model of the programme. South Africa has deeply rooted structural unemployment, which, by its nature, falls outside the scope of a short-term policy or programme response. This necessitates bringing together of approaches as informed by both the Keynesian theory (which favours government intervention) and the Neoliberalism (which is in support of free markets). If only the Keynesian approach is adopted, the typical short-term EPWP approach would fall short of effectively addressing the structural unemployment problem.

This paper rejects the notion that the EPWP should utilise its short-term capabilities drawn from standard PEP or PWP approaches to tackle a long-term challenge. This argument is in line with findings by [15, 28-29] who argued that policy must be designed to address the long-term nature of the challenges. Two key issues make the South African case unique; firstly, unemployment in the country is structural, making the challenge intractable from neoliberal approaches such as boosting the economy alone and expecting the markets to absorb the unemployed. Secondly, unemployment in South Africa affects women and youth more than it does men, essentially meaning that the approach needs to be unique and oriented towards addressing these two critical aspects. The challenges in the developed and developing world have laid bare the weaknesses of these programmes which this paper recommends a more practical approach to solving long-term challenges which deviate from the usual norm of short-term government intervention alone.

5. Conclusions

Discussions in the findings above highlighted that the EPWP is too broad and as a result its impact especially on unemployment of women and youth is insignificant. The issues raised in data collection necessitate the need for the programme to be redesigned. In its current form its contribution is minimal. Key questions to be addressed in this regard include whether the programme should shift its focus from short-term crisis relief to provision of longer term opportunities in recognition of the structural and long-term characteristics of unemployment. The second option will be to design itself as an employer of last resort. In the first instance the programme will be focusing on the quality of jobs which means skills development and work experience will be key in the programme design. In the second instance the programme will be providing employment to the poor and unskilled who cannot be absorbed by the labour thus, focusing on the quantity of jobs. The EPWP is a twin programme which provides social protection and employment opportunities. Trying to pursue both is overwhelming to the programme thus, leading it to only scratch on the surface with nothing much to show. However, the country's poverty and unemployment challenges are urgent. This means if the twin programme is to be successful there is a need for it to be redesigned. Redesigning, therefore, means the programme should separate its social protection imperatives from the creation of employment opportunities. Mixing the two groups deprives new labour market entrants or youth from getting full-time employment in the future.

This therefore leads to a discussion on what the programme can do differently in order to be able to (1) provide a cushion to the poor and (2) facilitate transition of women and youth to full-time employment. In designing the programme it is important to consider that the country is sitting on a *'ticking time bomb'* due to the unemployment of women and youth which makes every effort towards addressing it urgent. People targeted by the programme have different needs. Youth and economically active people need skills or work experience to re-join the labour market. There is another group that needs to be cushioned from poverty. These different needs are to be taken into consideration in the design of the programme.

In redesigning the programme the process should address three (3) questions as follows:

- i. *Who* – the programme should separate EPWP participants according to their needs (those who need cushion from poverty or unskilled who are economically active).

- ii. *What* – social protection or creation of employment opportunities. In this case, EPWP participants should be classified according to needs to either under social protection or creation of employment opportunities.
- iii. *How* – this is the implementation part of the programme, which will be guided by the classification of the EPWP participants. The stakeholder mix and programme offer to be in such a way that it supports transition to employment or social protection.

This means the package for employment seekers needs to be different from that of social protection beneficiaries. In relation to the former this paper proposes that unskilled or semi-skilled economically active women and youth are targeted by the programme. In the case of the later the aim is to provide a cushion to the poor. Public private partnerships, skills development, type of activities is necessary to facilitate transition to full time employment so that the economically are not trapped on the programme with no way out. The programme will need to expand on the quantity of job opportunities to cater for the large numbers that need social protection. While working on the programme participants need to be taught life skills or be linked with entities that support such initiatives. Policy needs to take into consideration the uniqueness of the challenge. Government efforts are to be directed towards a more sustainable approach which future studies need to look into more innovative ways to be used in solving these challenges.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Faith, B.; Flynn, J.; Hernandez, K.; Roberts, T. *The future of work: Findings of research commissioned by the Oxfam 'Empower youth for work programme'*. Available online: <https://opendocs.ids.ac.uk/opendocs/bitstream/handle/20.500.12413/15595/rr-future-work-empower-youth-program-280720-en.pdf?sequence=1&isAllowed=y> (accessed on 13 May 2019).
2. Van Aardt, I. A review of unemployment in South Africa, 2004 to 2011. *South African Journal of Labour Relations* 2012, 36(1), pp. 54-68. <https://hdl.handle.net/10520/EJC120858>
3. Yu D. Youth unemployment in South Africa revisited. *Development Southern Africa* 2013, 4-5(30), pp. 545-563. <http://dx.doi.org/10.1080/0376835X.2013.830964>
4. Statistics South Africa. Quarterly Labour Force Survey (QLFS) – Q4:2021. 29 March 2022. Available online: <http://www.statssa.gov.za/publications/P0211/Media%20release%20QLFS%20Q4%202021.pdf> (accessed on 15 April 2022).
5. Statistics South Africa. Quarterly Labour Force Survey (QLFS) - Q3:2021. 30 November 2021. Available online: <https://www.statssa.gov.za/?p=14957> (accessed on 15 April 2022).
6. The Global Economy. Women unemployment in Africa. 2019. Available online: https://www.theglobaleconomy.com/rankings/Women_unemployment/Africa/ (accessed on 18 January 2020).
7. The Global Economy. Youth unemployment in Africa. 2019. Available online: https://www.theglobaleconomy.com/rankings/Youth_unemployment/Africa/ (accessed on 18 January 2020).
8. Gugelev, A. Creating jobs and sustainable livelihoods in a changing world. 2018. Publication, Global Development Incubator. Available online: <https://globaldevincubator.org/wp-content/uploads/2019/09/.pdf> (accessed on 22 March 2019).
9. Beall J.; Crankshaw O.; Parnell S. The causes of unemployment in post-apartheid Johannesburg and the livelihood strategies of the poor. *Journal of Economic and Social Geography* 2000, 91(4), pp. 379-396.
10. McCord A.; Bhorat H. Employment and labour market trends. *Human Resource Development Review*, 2003, pp. 112-141. Available online: https://open.uct.ac.za/bitstream/item/22993/McCord_Employmentlabour_market_2003.pdf?sequence=1 (accessed on 22 March 2019).
11. Ferreira, L; Rossouw, R. South Africa's economic policies on unemployment: A historical analysis of two decades of transition. *Journal of Economic and Financial Sciences* 2016, 9(3), pp. 807-832.

12. ILO. Public Employment Programmes (PEPs)-Creating decent jobs through National Investments Employment- Intensive Investment Programme (EIIP). Publications, International Labour Organisation. 20 October 2020. Available online: https://www.ilo.org/wcmsp5/groups/public/---d_emp/documents/publication/wcms_759118.pdf (accessed on 13 January 2021).
13. Eichler M.; Lechner M. An evaluation of public employment programmes in the East German State of Sachsen-Anhalt. *Labour Economics* 2002, 9(2), pp. 143-186.
14. Altman M. The State of Employment and Unemployment in South Africa. Pretoria, Government Technical Advisory Centre. 2004. Available online: <https://www.gtac.gov.za/Researchdocs/TheStateofEmploymentandUnemploymentinSouthAfrica.pdf> (accessed on 15 April 2018).
15. McCord A. A critical evaluation of training within the South African National Public Works Programme. *Journal of Vocational Education and Training* 2005, 57(4), pp. 565-588.
16. Mail and Guardian Online. Launch of the Extended Public Works Programme. *Mail and Guardian*, 18 May 2004. Available online: <https://mg.co.za/article/2004-05-04-00-launch-of-extended-public-works-programme/> (accessed on 08 May 2018).
17. Altman, M.; Hemson, D. The role of Expanded Public Works Programmes in halving unemployment Human Science Research Council, Pretoria. 2007. Available online: http://repository.hsrb.ac.za/bitstream/handle/20.500.11910/5819/4852_Altman_Roleofexpandedpublicworks.pdf?sequence=1 (accessed on 08 May 2018).
18. Parliament Monitoring Group. Community-Based Public Works Programme. Cape Town, Parliamentary Monitoring Group. 30 May 2001. Available online: <https://pmg.org.za/committee-meeting/657/#:~:text=TheemphasisoftheCommunity,povertyespeciallyinruralareas.&text=TheDepartmentismakingefforts,communityprojectsandtrainingpeople> (accessed on 09 May 2019).
19. Department of Public Works. White Paper- Public Works towards the 21st Century. White paper, Department of Public Works. 1997. Available online: http://www.publicworks.gov.za/PDFs/documents/WhitePapers/White/Paper-publicWorks_towards_the_21st_Century.pdf (accessed on 12 April 2018).
20. Sibeko, B. The cost of austerity: Lessons for South Africa. *Institute for Economic Justice Working Paper Series*, 2019, 2. Available online: <https://iej.org.za/wp-content/uploads/2020/02/The-cost-austerity-lessons-for-South-Africa-IEJ-30-10-2019.pdf> (accessed on 12 April 2018).
21. Nath, N. The Public Works Department. 2021. Available online: <https://southasia.ucla.edu/history-politics/colonial-epistemologies/public-works-department/> (accessed on 16 April 2021).
22. SARP. Growth and development summit agreement: 7 June 2003. 2003. NEDLAC, summit resolutions. Available online: https://sarpn.org/documents/d0000370/P355_Nedlac_Agreement.pdf (accessed on 26 November 2020).
23. Gehrke E.; Hartwig R. How can Public Works Programmes create sustainable employment? 2015. Available online: <http://www.die-gdi.de/discussion-paper/article/how-can-publicsprogrammes-create-sustainable-employment.pdf> (accessed on 21 April 2018).
24. Subbarao, K; del Ninno, C.; Andres, C.; Rodriguez-Alas, C. Public Works as safety net - Design, evidence and implementation. Washington DC: Library of Congress Cataloguing in Publication Data. 2013. Available online: <https://openknowledge.worldbank.org/handle/10986/11882> (accessed on 22 May 2018).
25. Dejardin, A.K. Public Works Programmes, a strategy for poverty alleviation: The gender dimension. 1996. Available online: https://www.ilo.org/wcmsp5/groups/public/ed_emp/documents/publication/wcms_123436.pdf (accessed on 10 March 2018).
26. Kostzer, D. Argentina: A case study on the Plan Jefes y Jefas de Hogar Descupados or the employment road to recovery. Argentina, *Working Paper No. 534*, Levy Economics Institute. 2008. Available online: http://www.levyinstitute.org/pubs/wp_534.pdf (accessed on 12 September 2018).
27. USA Work Program, 1937. The Works Programme. 1937. Available online: <http://cweb.loc.gov/service/gdc/scd/0001/2008/2008021200lfi.pdf> (accessed on 09 May 2018).
28. Meth C. Employer of last resort? South Africa's Expanded Public Works Programme (EPWP). Cape Town, *Southern African Labour and Development Research Unit working paper number 58*. 2011. Available online: http://opensaldr.uct.ac.za/bitstream/handle/11090/59/2011_58.pdf?sequence=1 (accessed on 03 August 2019).

29. Phillip, K. The transformative potential of Public Employment Programmes. University of Cape Town. *Occasional Paper Series* 2013, 1. Available online: http://www.mandelaschool.uct.ac.za/sites/default/files/image_tool/images/78/files/pubs/KatePhillip_transformativepotentialof%PEPs.pdf (accessed on 13 November 2019).
30. Department of Women. The status of women in the South African economy. Pretoria, Publication.2015. Available online: http://www.gov.za/sites/default/files/gcis_document/201508/Statusofwomeninsaeconomy.pdf (accessed on 17 November 2021).
31. Subramanian, K.R. Social and cultural expectations and changing role of women. *International Journal of Engineering and Management Research* 2018, 8(2), pp.110-117.
32. Mayne, J. Useful theory of change model. *Canadian Journal of Programme Evaluation* 2015, 30(2), pp. 119-142.
33. Hlatshwayo, M. The Expanded Public Works Programme: Perspectives of direct beneficiaries. *The Journal for Transdisciplinary Research in Southern Africa* 2017, 13(1), a439.
34. Driscoll, D. L.; Applah-Yeboah A.; Salib P.; Rupert D P. Merging qualitative and quantitative data in mixed methods of research: How to and why not. *Journal of Ecological and Environmental Anthropology* 2007, 3(1), pp. 19-28.
35. Parliament of the Republic of South Africa. Announcements, tablings and committee reports. Cape Town, Parliament of the Republic of South Africa portfolio committee discussion. 14 February 2019. Available online: <https://parliament.gov.za/storage/app/media/Docs/Atc/e00a5dc2-29d3-4571-88a2-7c60d4b44620.pdf> (accessed on 13 July 2020).
36. EPWP Reports. Monitoring and Evaluations Reports. Department of Public Works and Infrastructure. 2019. Available online: <http://www.epwp.gov.za/Downloads/report.pdf> (accessed on 12 May 2020).
37. Statistics South Africa. Quarterly labour force survey trends 2008-2020Q2. 2020. Available online: <http://www.Statistics South Africa.gov.za/publications/P0211/QLFSTrends2008-2020Q2.xlsx> (accessed on 01 August 2020).
38. South African Cities Networks. Our Expanded Public Works Programme reflections over decade. South African City Networks, report. 2016. Available online: http://www.sacities.net/wp-content/uploads/2019/12/SACN_epwp_2016_final.pdf (accessed on 12 July 2019).
39. Mr Adams, Interview, Kimberley, 03 October 2020.
40. Mr Pietersen, Interview, Kimberley, 03 October 2020.
41. Mr Gill, Interview, Kuruman, 17 October 2020.
42. Keneilwe, Interview, Kimberley, 26 September 2020.
43. Kealagile, Interview, Glenred Village, 19 September 2020.
44. Mrs van Rooyen, Interview, Pretoria, 12 October 2020.
45. Mercy, Interview, Kimberley, 24 October 2020.
46. Mr Nzama, Interview, Kimberley, 03 October 2020.
47. Africa Newswire. SAMWU calling mass EPWP general meeting. *SAMWU press release*, 09 February 2015. <https://www.africanewswire.za.com/EFBBBFsamwu-calling-mass-epwp-general-meeting-press-release/default.html> Accessed on 08 May 2018.
48. COSATU. Organised labour rejects the 5% National Minimum Wage increase. 27 January 2020. <http://mediadon.co.za/2020/01/27/organized-labour-rejects-the-proposed-5-national-minimum-wage-increase/> Accessed on 12 April 2020.
49. Auditor General of South Africa. Integrated Annual Report 2018-19. 2019. Available online: <https://www.agsa.co.za/Reporting/AnnualReport.aspx> (accessed on 17 October 2020).
50. Fourie, D.; Malan, C. Public procurement in the South African economy: Addressing the systematic issues. *Sustainability* 2020, (12), pp. 8692.
51. Reinholz, D.L.; Andrews, T.C. Change theory and the theory of change: What's the difference anyway? *International Journal of STEM Education* 2020, 7(2), pp. 1-12.

Citation: Sibanda, N.; Thebe, V. South Africa's structural unemployment of women and youth: an analysis of the expanded public works programme model. *Journal of Social Sciences* 2022, 5 (3), pp. 17-32. [https://doi.org/10.52326/jss.utm.2022.5\(3\).02](https://doi.org/10.52326/jss.utm.2022.5(3).02).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).03](https://doi.org/10.52326/jss.utm.2022.5(3).03)
UDC 330.35+330.59(594)



THE RELATIONSHIP BETWEEN ECONOMIC GROWTH AND POVERTY IN INDONESIA

Muhammad Bukhori Dalimunthe^{1*}, ORCID: 0000-0002-2422-5568,
Bethlehem Efrata Sitanggang¹, ORCID: 0000-0002-4416-8863,
Fitri Yani Panggabean², ORCID: 0000-0002-0589-1223

¹Universitas Negeri Medan, Willem Iskandar street, Medan, Indonesia

²Universitas Pembangunan Panca Budi, Gatot Subroto street, Medan, Indonesia

*Corresponding author: Muhammad Bukhori Dalimunthe, daliori86@unimed.ac.id

Received: 06.18.2022

Accepted: 08.07.2022

Abstract. Economic growth is one of the main parameters to evaluate a country's development efficiency. The higher the economic growth, the more productive and advanced the country will be. On the other hand, economic growth is also a strategic step to reduce poverty, which has always been an urgent problem in various parts of the world. Therefore, economic growth is needed to prosper the community through equitable economic growth. The purpose of this paper is to analyze economic growth against poverty. Data analysis used the literature review method from articles sourced from the Science and Technology Index (SINTA). The analysis is based on the latest findings on economic growth and poverty in Indonesia over the last decade. Research findings reveal that the synthesis of economic growth impacts reducing poverty in Indonesia. Furthermore, suppose economic growth is evenly distributed at all levels of society. In that case, the role of government is fair, honest, and responsible. As a result, the competence of human resources increases, and job opportunities will be wide open to absorb workers, positively impacting poverty in Indonesia.

Keywords: *human resources, job opportunities, literature review.*

Rezumat. Creșterea economică este unul dintre principalii parametri de evaluare a eficienței dezvoltării unei țări. Cu cât creșterea economică este mai mare, cu atât țara va fi mai productivă și mai avansată. Pe de altă parte, creșterea economică este, de asemenea, un pas strategic pentru reducerea sărăciei, care a fost întotdeauna o problemă urgentă în diferite părți ale lumii. Prin urmare, creșterea economică este necesară pentru a prospera comunitatea printr-o creștere economică echitabilă. Scopul acestei lucrări este de a analiza creșterea economică în raport cu evoluția sărăciei. Analiza datelor a folosit metoda de revizuire a literaturii de specialitate din articolele din baza de date Science and Technology Index (SINTA). Analiza se bazează pe cele mai recente constatări privind creșterea economică și sărăcia în Indonezia din ultimul deceniu. Rezultatele cercetării arată, că sinteza creșterii economice are un impact definit asupra reducerii sărăciei în Indonezia. S-a presupus că creșterea economică este distribuită uniform la toate nivelurile societății. În acest caz, rolul

guvernului este corect, onest și responsabil. Drept urmare, competența resurselor umane crește, iar oportunitățile de angajare vor fi larg deschise pentru a absorbi lucrătorii, având un impact pozitiv asupra sărăciei în Indonezia.

Cuvinte cheie: *resurse umane, oportunități de angajare, revizuire a literaturii.*

1. Introduction

Economic growth and poverty are crucial parameters for development success in various countries. Of course, all countries always try their best to achieve ideal economic growth and can reduce poverty. The immediate solution to creating poverty reduction in various countries is economic growth. However, what kind of economic growth can reduce poverty levels? Because in developing countries like Indonesia, the economic growth achieved is also accompanied by the problem of increasing the number of people who are still in poverty areas [1].

Poverty is a fundamental problem and is the focus of government activities in every country. In almost all developing countries, the average population has a deficient standard of living. For example, suppose you look at the life of a group of wealthy people and elites who control the economy in their own country. This can be observed from the value or form of a deficient level of income or poverty [2]. In Indonesia, poverty is a classic and challenging problem to solve, which is interrelated with fundamental problems related to the needs of individuals or groups in an area. Based on the Socio-Economic Survey conducted by the Central Statistics Agency (CSA) in 2009, it was recorded that 32.5 million people, or around 14.2% of Indonesia's population, still live in poverty.

The people trapped in poverty suffer from malnutrition, low access to education, high illiteracy, living in dirty settlements, and having no access to infrastructure or inadequate public services [1]. In the case of Indonesia, Freeport-McMoRan Copper & Gold Inc., or Freeport NYSE: FCX, is one of the world's largest gold producers [3, 4]. It is an American company with one of its branches in Indonesia, precisely in Timika, Papua. Therefore, there will be economic growth for Indonesia, which is well known as a gold mining corporation that reaps many benefits. Nevertheless, can the poverty rate in Papua be reduced? The answer is No. In 2017, the poor in Papua reached 897.69 thousand. They are classified as poor because spending on food and non-food items is still below the poverty line of Rp 457,541/person/month [5]. CSA also states that around 16.99% of the population in the age range 15-24 categorized as poor are illiterate, and around 22.61% of the poor aged 7-12 are not in school [4].

Based on these problems, it is revealed that economic growth does not directly reduce poverty in Indonesia. The current poverty rate in Indonesia is still high, and poor people continue to emerge. Economic growth is an essential indicator in reducing poverty levels. Therefore, the poverty rate will decrease if economic growth improves. It achieves moderate economic growth, and it is necessary to commit the government and the role of the community to be more productive in producing and consuming goods or services that are made themselves. The poverty rate will decrease if quality economic growth is created, namely equitable economic growth, and there is no wide economic gap in society.

Atiyatna et al. [6] explained that economic growth could directly reduce foreign intervention in Indonesia. There is no need for too many roles of foreign countries if Indonesia continues to learn to process its natural resources wisely and on target. Because if we look into it again, the result is that foreign countries will benefit more, and Indonesia may be more

disadvantaged. From the explanation above, this problem does not stop here, and it needs to be studied further, especially to realize the occurrence of quality economic growth. Thus, researchers are encouraged to examine economic growth's effect on Indonesia's poverty. This study aims for researchers to know what kind of economic growth can better reduce poverty in Indonesia. Hopefully, the results of this research can be used as a review of the development economics study.

2. Method

In writing this article, the researcher uses the literature review method [7], which is systematic, explicit, and reproducible to identify, evaluate and synthesize to summarize research results and thoughts previously made by researchers and practitioners [8]. The data source uses the Science and Technology Index database (SINTA; see sinta3.kemdikbud.go.id). The analysis is based on the latest findings on economic growth and poverty in Indonesia over the last decade.

3. Results and Discussion

The results of a literature review reveal that humans are never separated from the role of economic growth in their daily lives. Economic growth has a role in supporting a country so that it does not fall into poverty so that this economic growth will be used as a benchmark for a country's prosperity [9]. Therefore, economic growth is expected to solve poverty in a sound economy. However, Indonesia's economy is currently a bubble economy, which means that although Indonesia's economic growth is high, the poverty rate is still high. Statistical figures still provide information that the number of poor people is still high through CSA data of 31.02 million people (13, 33%) of the number of poor people in Indonesia in March 2010 [10].

Jufriadi [11] argues that the problem of poverty is not a new problem and has become the seed of disease in every country. Poverty is a condition of a person's life that continues to experience a decline in both the amount of income and living conditions. The government has made many efforts to resolve the problem of poverty immediately, but the poverty level is still difficult to resolve. This is due to the low quality of human resources, and many people do not feel equitable economic growth [12].

Overcoming poverty in Indonesia requires role of economic growth in every sector. Puspita [13] in his research, explains that economic growth is an essential part of reviewing how effective a country is so that benchmarks can be made on how to overcome poverty. However, the effect of economic growth on poverty has a different understanding for everyone [14]. Purnama [15] said that economic growth has a negative and significant impact on the poverty rate, which means that if economic growth increases, poverty will decrease. The economic growth in question is quality economic growth. This is in line with research conducted by Soleh [16], who argues that increased economic growth can support the population's welfare but does not guarantee that every society is prosperous. The poor and poverty levels are still growing due to poor economic growth.

Furthermore, Jonaidi [17] explicitly reveals a close two-way relationship between economic growth and poverty in Indonesia. Economic growth significantly impacts poverty reduction, especially in places with pockets of poverty, such as rural areas. On the other hand, poverty also significantly impacts economic growth. Subsequent research by Jayadi and Brata [2] explained that economic growth had no significant effect on poverty rates. This is because the economic growth in Jambi Province still has a dividing gap and group differences between the rich and the poor, so economic growth cannot suppress poverty. Meanwhile, Khusuma

[18] said that economic growth needs to be paid more attention to government spending so that any costs incurred are managed and reviewed so there is no waste of funds.

Economic growth means showing economic progress so that in society, there is an increase in consumption and production of goods and services to create prosperity. Thus, a country needs to achieve economic growth to calculate real national income based on fixed prices at the prices applied in the selected base year [19]. Thus, economic growth measures the achievement of an economy's development [20]. Based on this explanation, it is known that every region in Indonesia experiences poverty. In essence, poverty has always been a classic problem that emerged when humans were born. Poverty is a complex and multifaceted problem and is likely to continue to be a real problem from time to time. Theoretically, the way to reduce poverty is through economic growth. Quality economic growth can reduce the poverty level of a country.

Findings from various articles that have been reviewed show that economic growth is not a guarantee for reducing poverty levels because there are many cases in Indonesia where the region is experiencing economic growth. However, the people still live in poverty, for example, in Papua. Papuans live in poverty, despite a gold mine in West Papua. Why does it happen? This is due to uneven economic growth and is only enjoyed by a handful of people. In addition, Indonesia still uses too many foreign workers, so it is difficult for local workers to find work. It takes human resources who can compete and are reliable in their work to minimize the proportion of foreign workers [16].

Suliswanto [10] explained that Indonesia needs to increase human capital development and increase the quantity of quality human resources. Quality means that human resources have the knowledge, competence, and skills to produce superior products that optimize the potential of natural resources. Furthermore, increasing abilities and skills will boost the productivity of individuals, households, companies, and regions, thus having a domino effect on suppressing the poverty index.

Highlighting the human resources problem requires strengthening the educational aspect, which is a strategic way to increase knowledge and skills. Individuals with competence and expertise will get jobs and significantly more income to finance household and individual consumption, and vice versa. So automatically, a country with a high poverty rate has a small income. The trickling effect theory explains that the progress made by a group of people will automatically trickle down to create different jobs and economic opportunities, thus creating different conditions to create an even distribution of economic growth outcomes [21, 22]. Furthermore, the theory explains that economic growth will be accompanied by a natural vertical flow from the rich to the poor. Rich people first enjoy the benefits of economic growth, and the poor feel the benefits when the rich appear and slowly spend the results of economic growth [23]. Therefore, the impact of economic growth on poverty reduction is an indirect impact of the vertical shaft from the rich to the poor. The poverty rate would decrease in a small way if the poor had only a small benefit compared to the benefits of overall economic growth.

This situation can provide opportunities for increasing poverty due to high-income inequality. This is because economic growth favors the rich rather than the poor. So it is a significant concern that economic growth can positively affect poverty alleviation if economic growth focuses on empowerment and regulations that reduce the poor, but that does not mean that the rich are ignored in the process of economic growth. On the contrary, the two groups must remain balanced so that each group's economic cycle runs dynamically and

evenly. Furthermore, quality economic growth will be able to create human resources who are ready to work, which will also play a role in reducing poverty levels.

4. Conclusions

Based on the research findings from the literature review, three main things were obtained: 1) Equitable and quality economic growth affect reducing poverty levels; 2) Poverty occurs due to a lack of education. There is a gap between the rich and poor groups, so many opportunities to obtain a prosperous life must be lost because the rich group is more dominant and powerful; 3) Human resources and job opportunities are indicators that affect poverty in Indonesia. Therefore, practical recommendations for economists to focus on developing micro and macro policy regulations highlight the indicators revealed in this paper.

Conflicts of Interest. The authors declare no conflict of interest.

References

1. Jonaidi, A.; Paramita, A.A.I.D.; Purbadharmaja, P.; Ani, N.L.N.P.; Dwirandra, A.A.N.B.; Pramesthi, R.N. *Analisis Pertumbuhan Ekonomi dan Kemiskinan. Kaji Ekon* 2014, 3, pp. 481-497.
2. Jayadi, D.S.; Brata, A.G. Peran Pertumbuhan Ekonomi Dalam Menurunkan Kemiskinan di Tingkat Provinsi di Indonesia Tahun 2004-2012. *Modus* 2016, 28(1), pp. 87-99.
3. Harianja, Y.; Findi, M. Tingkat Kemiskinan Di Pulau Papua Tahun 20011-2017. *J Ekon dan Kebijakan Pembang* 2018, 7(2), pp. 189-200.
4. Nefi, A.; Malebra, I.; Ayuningtyas, D.P. Implikasi Keberlakuan Kontrak Karya PT Freeport Indonesia Pasca Undang-Undang No 4 Tahun 2009 Tentang Pertambangan Mineral dan Batubara. *J Huk Pembang* 2018, 48(1), pp. 137-163.
5. Khomsan, A.; Dharmawan, A.H.; Sukandar, D.; Syarief, H. *Indikator Kemiskinan dan Misklasifikasi Orang Miskin; Yayasan Pustaka Obor Indonesia*. Jakarta, Indonesia, 2015; pp. 1-131.
6. Atiyatna, P.; Muhyiddin, D.; Bambang, N.; Soebaykto. Pengaruh upah minimum, pertumbuhan ekonomi dan pendidikan terhadap penyerapan tenaga kerja di Provinsi Sumatera Selatan. *J Ekon Pembang* 2016, 14(1), pp. 8-21.
7. Snyder, H. Literature review as a research methodology: An overview and guidelines. *J Bus Res.* 2019, 104, pp. 333-339.
8. Hua, A.K. Pengenalan Rangkakerja Metodologi dalam Kajian Penyelidikan: Satu Kajian Literatur. *Malaysian J Soc Sci Humanit.* 2016, 1(2), pp. 17-24.
9. Syofya, H. Pengaruh Tingkat Kemiskinan dan Pertumbuhan Ekonomi terhadap Indeks Pembangunan Manusia Indonesia. *J Ilm Ekon Dan Bisnis.* 2018, 15(2), pp. 177-185.
10. Suliswanto, M.S.W. Pengaruh Produk Domestik Bruto (PDB) dan Indeks Pembangunan Manusia (IPM) terhadap Angka Kemiskinan di Indonesia. *Jurnal Ekonomi Pembangunan.* 2010, 8(2), pp. 357-366
11. Jufriadi. Faktor-Faktor yang Berpengaruh terhadap Kemiskinan di Kabupaten Sampang, Madura. *Jurnal Ekonomi Pembangunan.* 2015, 13(2), pp. 252-269.
12. Sugiyarto, S.; Mulyo, J.H.; Seleky, R.N. Kemiskinan dan Ketimpangan Pendapatan Rumah Tangga di Kabupaten Bojonegoro. *Agro Ekonomi.* 2015, 26(2), pp. 115-120.
13. Puspita, D.W. Analisis Determinan Kemiskinan di Provinsi Jawa Tengah. *J Ekon Kebijakan Publik.* 2015, 8(1), pp. 100-107.
14. Ginting, A.M.; Dewi, G.P. Pengaruh Pertumbuhan Ekonomi dan Pertumbuhan Sektor Keuangan terhadap Pengurangan Kemiskinan di Indonesia. *J Ekon Kebijakan Publik.* 2013, 4(2), pp. 117-130.
15. Purnama, N.I. Pengaruh Pajak dan Subsidi pada Keseimbangan Pasar. *Jurnal Ekonomikawan.* 2017, 16(1), pp. 32-37.
16. Soleh, A. Pertumbuhan Ekonomi dan Kemiskinan di Indonesia. *EKOMBIS Rev J Ilm Ekon dan Bisnis.* 2015, 2(2), pp. 197-209.
17. Jonaidi, A. Analisis Pertumbuhan Ekonomi dan Kemiskinan. *Kaji Ekon.* 2012, 1, pp. 140-164.
18. Khusuma, B. Desentralisasi Fiskal dan Pertumbuhan Ekonomi: Sebelum dan Sesudah Era Desentralisasi Fiskal di Indonesia. *J Ekon dan Stud Pembang.* 2013, 14(2), pp. 101-119.
19. Tisniwati, B. Analisis Faktor-Faktor yang Mempengaruhi Tingkat Kemiskinan di Indonesia. *Jurnal Ekonomi Pembanguna.* 2012, 10(1), pp. 32-46.

20. Nuraini, I. Kualitas Pertumbuhan Ekonomi Daerah Kabupaten/Kota di Jawa Timur. In *Proceedings of Seminar Nasional*, Malang, Indonesia, May 17, 2017; FEB Universitas PGRI Kanjuruhan Malang: Malang, Indonesia, 2017, pp. 79-93.
21. Faritz, M.N; Soejoto, A. Pengaruh Pertumbuhan Ekonomi dan Rata-Rata Lama Sekolah terhadap Kemiskinan di Provinsi Jawa Tengah. *J Pendidik Ekon.* 2020, 8(1), pp. 15-21.
22. Prasetyoningrum, A.K; Sukmawati, U.S. Analisis Pengaruh Indeks Pembangunan Manusia (IPM), Pertumbuhan Ekonomi dan Pengangguran terhadap Kemiskinan di Indonesia. *Equilib J Ekon Syariah.* 2018, 6(2), pp. 217-240.
23. Romi; Umiyati, S; Etik. Pengaruh Pertumbuhan Ekonomi dan Upah Minimum terhadap Kemiskinan di Kota Jambi. *e-Jurnal Perspekt Ekon dan Pembang Drh.* 2018, 7(1), pp. 1-7.

Citation: Dalimunthe, M. B.; Sitanggang, B. E.; Panggabean, F. Y. The relationship between economic growth and poverty in Indonesia. *Journal of Social Sciences* 2022, 5 (3), pp. 33-38. [https://doi.org/10.52326/jss.utm.2022.5\(3\).03](https://doi.org/10.52326/jss.utm.2022.5(3).03).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).04](https://doi.org/10.52326/jss.utm.2022.5(3).04)
UDC 316.6:159.9



WHAT IS SOCIAL INTELLIGENCE?

Titu-Marius I. Băjenescu*, ORCID ID: 0000-0002-9371-6766

Swiss Technology Association, Electronics Group Switzerland

*Corresponding author: Titu-Marius I. Băjenescu, tmbajenesco@gmail.com

Received: 05. 28. 2022

Accepted: 07. 12. 2022

Abstract. The article analyses a social problem with a major impact on the development of society, the macroeconomics, but also on each individual. The ability of some people to understand the behaviours, thoughts, and feelings of others and to interact effectively with them is called social intelligence. Also called interpersonal intelligence, it is closely related to emotional intelligence. Emotional intelligence is a person's ability to understand and control their own emotions, as well as the ability to deal with those of others. Although complicated to measure, these two forms of intelligence are particularly useful in everyday life: family or friends, married life, professional life...

Keywords: *social intelligence, emotional intelligence, social relations, reliable scientific knowledge, interaction of economy, culture and social structure, economy as a politically controllable apparatus, concept of "embeddedness", anthropology, sociology, generalizable theory of social systems, statistical experiments, definitions and empirical statements, ethical aspects.*

Rezumat. Articolul analizează o problemă socială cu impact major asupra dezvoltării societății, a macroeconomiei, dar și asupra fiecărui individ. Capacitatea unor oameni de a înțelege comportamentele, gândurile și sentimentele altora și de a interacționa eficient cu ei se numește inteligență socială. Numită și inteligență interpersonală, este strâns legată de inteligența emoțională. Inteligența emoțională este capacitatea unei persoane de a-și înțelege și controla propriile emoții, precum și abilitatea de a face față celor ale altora. Deși complicate de măsurat, aceste două forme de inteligență sunt deosebit de utile în viața de zi cu zi: familia sau prietenii, viața de cuplu, viața profesională...

Cuvinte cheie: *inteligență socială, inteligență emoțională, relații sociale, cunoștințe științifice de încredere, interacțiunea economiei, culturii și structurii sociale, economia ca aparat controlabil politic, conceptul de „înglobare”, antropologie, sociologie, teoria generalizată a sistemelor sociale, experimente statistice, definiții și enunțuri empirice, aspecte etice.*

1. Introduction

Sociology as a science can be approached in various ways. I will exclude the case where someone has always wanted to get into the spirit of the times and knew from the

beginning that only sociology could help them. What seems more typical to me is the groping attempt to find a science that seems to provide an answer for a diffuse interest in what holds society together at its core and what this has to do with us as individuals [1]. As with all tentative attempts, one is certainly not unimpressed by what one "hears" in this respect, and some things one "knows" "approximately". I mean this without irony. That's how it is on a large and small scale, and science doesn't begin any differently.

Have you ever had the impression that some people are easier to talk to than others? Did you know that with a little practice you can also develop interpersonal skills? Developing social intelligence is useful for improving one's relationship with others. It allows you to better observe and understand them. This relational ease is an increasingly sought-after skill in the professional world. An individual who is able to understand his or her colleagues or clients, to put himself or herself in their place and influence them is an asset. Strengthening social intelligence has many beneficial effects in everyday life. Working on this skill helps to get rid of bad communication habits such as cutting others off, judging hastily, speaking too fast... But it will also make your personal and professional relationships more fluid. In some cases, using your social intelligence can avoid complicated situations or defuse conflict [2].

2. Development

Sociology is not about eternal or definitive truths that reassure one, reassuring, but rather about reflected certainty. But this can only be obtained after some anxiety and - it must be must be won again and again! Sociology is not an easy business, but that does not make it boring. Even more, it is able to surprise us where we think we are quite sure. Sociology does not begin far above our heads or in a foreign country, nor with the others, but here. And that's why you have to reckon with the fact that Sociology will initially disorient you: Nothing takes more time and intellectual effort than the gradual development of a constantly alert sociological consciousness [3]. For it involves a complete change of the habitual perspective with which we orient ourselves in the everyday world. The beginner in the study of sociology will initially measure his progress by a growing and, under certain circumstances, very profound disorientation towards his own disorientation towards his own living conditions, which can only be overcome by the alienating and relativising experience.

Economic sociology can be defined briefly as the application of the sociological tradition to economic phenomena, in an attempt to explain these [4]. Economic sociology shares most of the concerns and goals of economics. On one point, however, it differs sharply from conventional economics; and this is through its direct and strong focus on the role that social relations and social institutions play in the economy. To live in society means to be connected to other people and take part in its institutions - and this deeply affects the economic actions of all economic actors. It affects the way in which such actions turn out individually as well as in aggregate. The patterns of social interaction and the institutions that people create and use in their attempts to make a living and a profit are what constitute the main subject area of economic sociology. As in game theory, there is no isolated homo economicus in sociology -only people who interact with one another in their attempts to realize their interests.

The point about using terms such as 'validity', 'goodness of fit' and 'plausibility' is that they allow for a whole range of possibilities. Truth is an absolute notion. A statement is either true or false. And although we need the notion of truth as a regulative ideal (Figure 1), a goal

to aspire to, we also need other terms such as validity and plausibility to cover the range of possibilities that typically occur in concrete social research when we fall short of the ideal.

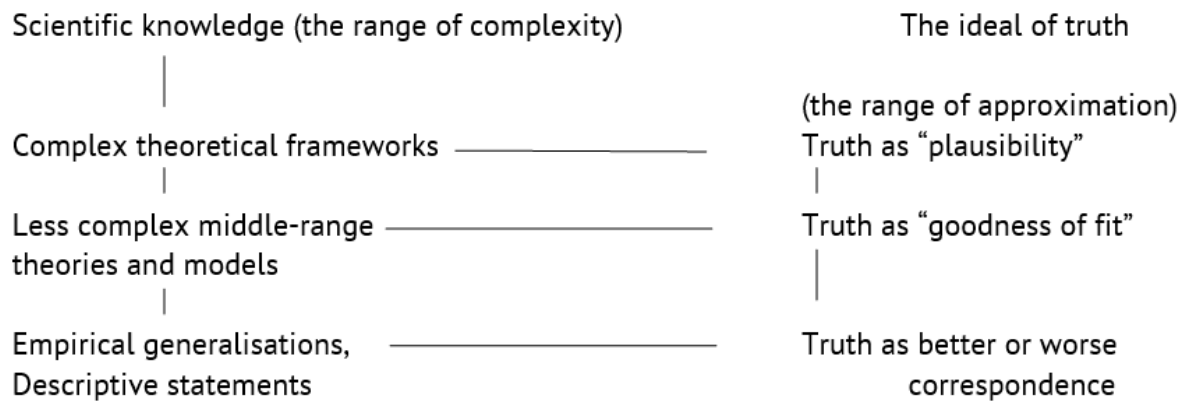


Figure 1. Scientific knowledge and the ideal of truth.

The basis for sociological study should be what we called “social facts,” or “realities external to the individual” that can be verified empirically [5].

Durkheim based his ideas on thorough research of empirical evidence, such as case studies and statistics. His major legacy was the establishment of sociology as an academic discipline in the tradition of the positivist doctrine of Comte – that social science is subject to the same investigative methods as the natural sciences.

Labor and Monopoly Capitalism is considered a classic contribution to the discipline of sociology, but it is the only academic book that Braverman ever wrote [6]. The book's influence on the application of critical Marxist thinking to the empirical study of industrial work has been profound. With Trotskyist tendencies, he joined the *Socialist Workers' Party* in the 1930s. He was one of the leaders of the so-called cochranite branch, which was excluded from the party in 1954, bringing Cochran to the party. George Weissman, a Trotskyist student at Harvard, recruited Siegel to the newly formed *Socialist Workers Party* (SWP) to found the *American Socialist Union*. Harry Braverman (1920-1976) is best known for his book *Labour and Monopoly Capitalism*, published in 1974. Braverman is neither a neo-marxist nor a post-Marxist, but a Marxist: he does not seek to go beyond Marxism but to update it by taking into account the changes that capitalism has undergone over the century. In particular, he is known to have shown that the labour process has become the responsibility of the capitalist, to the extent that his reflection is often presented as a labour process theory. More precisely, starting from the observation that the capitalist does not buy a quantity of labour but a labour power during a given time, he shows the importance of the labour power control processes: in order to achieve the highest possible rent, the capitalist will seek to increase the yield of labour power, which is achieved in particular through the organisation and control of labour [7].

3. Fake News

Fake news is the intentional spreading of false information. Vaccinate yourself against the contagion of nonsense! We are an extraordinarily social species. Trusting others has been favourable to the survival of our ancestors. The downside is that we are easy victims for cheats, liars, swindlers and bullshitters.

We all have an interest in 'believing' as much as possible that is true and as little that is false as possible. We even have a personal interest in everyone doing the same: collective decisions will then be based on solid facts, public policies will be more effective, society will

be better off. I put "believe" in inverted commas because of the strong polysemy of the word; here I use it in the sense of "hold as true".

Of course, we know from experience that we sometimes "believe" false things, that we are wrong [8]. Sometimes we are even stubborn, and moreover we know how to recognise - at least in others - the signs of obstinacy in error. What we still need to really understand, measure and manage is that these errors are not random, they do not go in all directions, but take paths of least resistance, and in particular the flaws in our rationality that are cognitive biases. We are willing to 'believe' some things and reject others. Some sound scientific theories run up against epistemological obstacles, while folk legends or national novels slip through the blind spot of our vigilance.

Not all truth is credible, there is no intrinsic strength of the true idea, and no direct relationship between the degree of conviction that a belief inspires and its veracity [9]. There are many reasons for this. First of all, the true suffers from the major handicap of not being able to be anything other than what it seems, on pain of escaping its own definition. The true is also sometimes disappointing, abstruse, undesirable, even brutal. The false, on the other hand, assumes the right to all the tricks, it adapts to the coveted ear, inflames the imagination, flatters prejudices. The battle is unequal, but we seek the real, and therein lies its only advantage. The true, the real, is what continues to exist even when we do not believe in it, it is what a well-dosed scepticism cannot deny [10].

No one has prepared us as citizens to defend ourselves against a form of disinformation capable of upsetting our brain function. You know a plethora of nonsense that uses the natural slopes of the mind to make a cozy place for itself in our representation of the world:

- There's a monster in Loch Ness.
- It's not human activity that is disrupting the climate.
- We have proof that the soul outlives the body.
- Homeopathy works better than placebo. Thanks to the "memory of water". Etc.

Poppycock has no real arguments, no connection to any of the means available to determine the adequacy of its content with the real world. It is essentially content to please, anger or frighten, to provoke an emotional response. Its existence does not require a desire to deceive on the part of those who produce and share it, but it occurs in an epistemic vacuum, in the absence of a critical approach to the raw thing.

Nor is poppycock just any false information; it is information that people find interesting to listen to and pass on. It therefore meets a certain number of criteria that make it formidable.

4. Economics and Politics

In view of the fact that the individual social sciences are not bound to specific subject areas of reality, this at the same time raises the question of why one should take on the not inconsiderable intellectual effort associated with a subject-didactic integration of the social science disciplines into one school subject (e.g. for student teachers, who are then expected to study not one, but three disciplines). The social science truism of the interdependence between economics and politics, i.e. the cross-border, mutual influence of actors, institutions and structures in the political and economic subsystems, which is often used to justify interdisciplinary integration, does not in itself constitute a convincing justification for this subject didactic project [11]. The reason for this lies in the fact that the interdependence

between economics and politics has already been recognised by one social science discipline alone, i.e. both by political science.

5. Archiving Ethical Aspects

Archiving refers to the process of transferring records from the individual or organization who created the material, to a repository for appraising, cataloguing, organizing, preserving, and providing access to others. Social and *behavioral science* research engenders by-products that are worthy of archiving for a variety of future uses, including the furthering of basic and applied research, policy making, and the development and replication of effective intervention programs. Examples of such archive-worthy by-products are research data, their associated data collection instruments (questionnaires, interview protocols), and, more recently, intervention programs shown to be effective by evaluation research. Ethical issues occasionally arise in the archiving process. These issues typically relate to protecting the integrity of the selection process; protecting respondents' confidentiality; censoring potentially controversial or offensive material; the timing of the release of information to an archive; assignment of due credit to both original producer and archivist; the tension between *fidelity* and *usability* in the archiving process; and the ownership of the research and development by-products contained in the archive [12].

6. Empirical Research

Empirical research cannot be learned by reading books alone. Practical experience in dealing with the instruments of empirical social research cannot be replaced by any textbook, no matter how complete and detailed [13].

Students of the social sciences or humanities acquire a wide variety of knowledge and skills, depending on the discipline. Independent of all subject content, academic education always also pursues the goal of enabling students to understand, assess and produce scientific knowledge themselves. Methodological competence is necessary for this active participation in gaining scientific knowledge. Because without research methods, science is not possible.

Empirical social and human research is concerned with social and human circumstances, i.e. with the behaviour, experience and coexistence of people as well as with physical and mental characteristics of the human being. In this context, "human" and "social" are not positive-values, but neutral-descriptive terms that refer to the human and the interpersonal.

7. Sociability

Far from being merely technical problems, the difficulties that accompany the *ageing* and *retirement* are social and even economic and society problems; because they owe their origin to the relations of power and competition society; because they challenge the established order and because their various solutions - in terms of economic or social policies and interventions - are available and require social work on the part of all social actors, and in particular of older people, within inter-generational social movements.

8. Sociology and Religion

When religion is spoken of, it is usually a description of a system of belief relations that manifests itself institutionally and organisationally in societies and includes individual and collective practices and beliefs. An important component of this system, especially for

the newer social sciences and social psychology, of this system is religiosity, i.e. the attitudes and behaviours with religious attitudes and modes of action with a religious connection. Religiosity is found in different forms and constellations in people. It strongly or weakly pronounced, guiding actions in everyday life or not, purely private or public or not, ritual or inwardly spiritually oriented. At the same time, the representative summarized religiosity of individuals provides information about an important component of the culture of a collective [14].

The discussion of the definition of religion is long and controversial. It concentrates on the component of religion that is individually bound: religiosity. In the process, the corresponding definitions of religiosity are transferred to religion, i.e. the system of meaning in general. Problems arise due to the limited direct accessibility of the phenomenon of religiosity since the transcendence and individual conceptions of religiosity are not available for research. However, neither the aim of the psychology of religion, nor the sociology of religion is to explore the transcendence or the essence of religions. The only interest is in fathoming religious phenomena in this world. However, even in the determination of what is religious in this world, there are considerable differences in the research community. They have even led to the recommendation of individual scholars to dispense with a definition altogether. Because of the impossibility of empirical research into the phenomenon of religiosity without a definition, this proposal was justifiably rejected. For the socio-psychological view, it is less the social and organisational system of religion, but rather individual religiosity and its collective integration.

The ambiguous twilight that surrounds the origin and essence of religion for us will not clear as long as one believes to see in it only a problem that needs a solution word [15,16]. No one has yet been able to give a definition that tells us, without vague generality and yet including all phenomena, what "religion" is. Neither against mere metaphysical speculation on the one hand, nor against belief in ghosts on the other, is it securely limited, not even in such a way that its purest and deepest manifestations would be protected from being tested for the addition of these elements. Such indeterminacy of its essence corresponds to the multiplicity of psychological motives from which reflection has caused it to spring.

A living social science is always interested in the ongoing theoretical work of reconstruction. Its "founding fathers" carried with them the project of a unified science, whose development was to be part of the irresistible movement of rationalisation and disenchantment in the world [17,18]. Most of them took up and developed, with various accents, the motif of a certain loss of influence of religion in modern societies. Some have celebrated the desalination associated with this loss. Others deplored the emotional chill and the drying up of values that it causes. Still others have pondered at length on its possible replacement by a common morality based on science.

The philosophy of praxis aims to connect practice and theory in order to establish a successful political action. The Catholic Church, in particular, embodies an ideology that is immanent and functional to an organised collectivity.

9. Conclusion Concerning Vieillessement and Retirement

The succession of policies for the social management of ageing and retirement must also be analysed from the point of view of the instituted effect of social relationships, beyond the techniques of defining needs and drawing up programmes [19].

Gerontological intervention, far beyond its methodological variants, technical forms and immediate results, will not produce the same social effects, depending on the forms and

orientations that its agents favour and on the types of social relations in which it is developed and engaged.

10. New Developments

Of course, there are always new developments within the constantly (and in recent years even rapidly) growing field of qualitative and interpretative social research. That would argue for new introductions. But this natural growth and almost inevitable differentiation of the field require, first and foremost, revised new editions of the already existing introductions, but not yet necessarily a new work [20]. If I despite this comfortable situation, this contribution is another introduction to the theory and practice of qualitative social research (which is not a real introduction in the conventional sense of the word), then for the following reasons:

The posterity of Foucault's work is today a fragmented figure. Few authors have had such an important impact across disciplinary fields, so much so that we can say that today we are all disciples of Foucault.

Discipline comes from the Latin term *disciplina*, derived from *discipulus*, "disciple". The word itself comes from *discere*, "to learn". So what meaning should we give to Foucaultian learning? Do the numerous Foucaultian conceptual creations and borrowings, such as biopolitics, surveillance society, episteme, device, panoptic, subjectivation, etc., retain their relevance today? What are the limits? What inflections has the contemporary era imposed on the type of reading proposed by Foucault? What do we still have to learn from such a way of thinking that has never stopped blurring the boundaries between philosophy, history, sociology and anthropology? It is clear that Foucault did not leave any of these fields untouched. Certainly, he has not failed to be at the center of multiple debates, during his lifetime as well as today, as much because of his political as well as theoretical commitments [21].

Forty years after *Surveiller et punir*, *La Société punitive* shows that with the concept of discipline, Foucault intended to propose a genealogy of sociology, and in particular of the Durkheimian program. Refusing to see law as the shaping of demands immanent to collective consciousness, he treats the moralization of punishment as a strategy put in place in the nineteenth century by a bourgeoisie anxious to protect itself against the new illegalisms brought about by the transformations of capitalist property [22,23]. By taking as a guiding thread the confrontation with the sociological evolutionism that underlies the history of penalty traced by Foucault, one propose to highlight the gains obtained by means of the archaeological method of dissolving historical continuities, but also the aporias that genealogy encounters in order to account for the formation of modern political subjects no longer based on forms of solidarity, but on the principle of a civil war underlying society.

Michel Foucault's work crosses fields whose boundaries are jealously guarded: philosophy, sociology, history, anthropology, linguistics, epistemology, art criticism [24]. The disciplinary boundaries of the social sciences and humanities.

The disciplinary boundaries of the social sciences and humanities are becoming blurred and new transversal bridges are being built, forcing many specialists to re-problematise their objects of study and intervention. How could it be otherwise when the notions of man and humanism are at the centre of Foucault's critique? This disciplinary confusion is both fertile and destabilising, renewing traditional ways of philosophising and problematising societal issues [25].

The radical nature of philosophical questioning, unabashedly transposed into the most varied disciplines (from psychiatry to law, from criminology to sexology, from medicine to biology), forces a double shift that poses major theoretical and methodological problems. While philosophy reconnects with the problems of the city, the empirical sciences are confronted with their conditions of possibility (formal, historical, social, political, economic, etc.). What has been done historically with the insane, the poor and the sick?

Why do we lock up certain categories of people? Why is it necessary to constantly say "who" we are? How do we govern? What are we dealing with? What does it mean to say "true"? How can we become the moral subject of our actions?

Foucault is no Durkheim. His method, sometimes obscure, encrypted or revealed here and there (interviews, lectures, articles, etc.), is constantly being revised and sometimes radically questioned (archaeology, structuralist method, genealogy problematisation, diagnosis, etc.) [26]. His key notions are successively redefined in the course of his work until they become unrecognisable (episteme, device, discipline knowledge, discourse, power, governmentality, subjection, subject, veridiction, etc.).

And, finally, the issues dealt with in his texts are not unanimously accepted by commentators, who multiply the effects of confusion and sometimes misinterpretation [27].

What exactly is this or that work talking about? What method is used?

Can we justify historically such and such a chronological division? Can we bring together in the same body of analysis very heterogeneous materials (architectural provisions, administrative regulations, taxonomies, paintings, obscure accounts of forgotten people, royal decrees, scientific theories, etc.)?

Despite a certain uneasiness that many sociologists feel towards these difficulties, it is clear that Michel Foucault's complex thought cannot be only at the cost of sterilising it, of undermining its originality and depriving it of its strength.

Conflicts of Interest. The author declares no conflict of interest.

References

1. Dymond, R.F. A scale for the measurement of empathic ability. *J. Couns. Psychol.* 1949, 13, pp. 127-133.
2. Thorndike, E.L. Intelligence and its uses. *Harper's Magazine* 1920, 140, pp. 227-235.
3. Goleman, D.; Boyatzis, R. Social intelligence and the biology of leadership. *Harv Bus Rev* 2008, 86(9), pp. 96-104.
4. Bariaud, F. L'intelligence sociale. *Enfance Persée*, 1996, 49(2), pp. 211-215.
5. Guilford, J.P. *The nature of human intelligence*. Ed. McGraw-Hill, New York, 1967, p. 538.
6. Lautrey J. La recherche des "particules élémentaires" de l'intelligence: une impasse? *Psychologie Française* 1996, 41, pp. 23-34.
7. Loarer, E. *Intelligence sociale et intelligence émotionnelle*, January 2005 [archive], Chapter 5.
8. Hunt, T. The measurement of social intelligence. *Journal of Applied Psychology* 1928, 12 (3), pp. 317-334.
9. *Are You Socially Intelligent?* Available online: <https://www.scientificamerican.com/article/are-you-socially-intelligent/> (accessed on 08.03.2022).
10. Wechsler, D. *The Measurement and Appraisal of Adult Intelligence*. Ed. Williams & Wilkins Co., 4th ed., 1958, p. 242.
11. Kosmitzki, C.; John O.P. The implicit use of explicit conception of social intelligence. *Personal Individ Differ* 1993, 15(1), pp. 11-23.
12. O'Sullivan, M.; Guilford, J.P.; de Mille, R. The measurement of social intelligence. *Reports from the Psychological Laboratory*. University of Southern California 1965, 34, pp. 1-14.
13. Keating, D.P. A search for social intelligence. *Journal of Educational Psychology* 1978, 70 (2), pp. 218-223.
14. Ford, M.E.; Tisak, M.S. A further search for social intelligence. *Journal of Educational Psychology* 1983, 75 (2), pp. 196-206.

15. Kramer, E. Judgment of personal characteristics and emotions from nonverbal properties of speech. *Psychological Bulletin* 1963, 60(4), pp. 408–420.
16. Silvera, D.H.; Martinussen, M.; Dahl, T. L. The tromso Social Intelligence Scale, a self report of social intelligence. *Scand J. Psychol.* 2001, 42(4), pp. 313–319.
17. Strang, R. Measures of Social Intelligence. *American Journal of Sociology* 1930, 36(2), pp. 263–269.
18. Wedeck, J. The relationship between personality and 'psychological ability'. *British Journal of Psychology* 1947, 37, pp.133–151.
19. Barnes, M.L.; Sternberg, R.J. Social intelligence and decoding of nonverbal cues *Intelligence* 1989, 13(2), pp. 263–287.
20. Sternberg, R.J.; Smith, C. Social Intelligence and Decoding Skills in Nonverbal Communication. *Social Cognition* 1985, 3(2), pp. 168–192.
21. Hogan, R. Development of an empathy scale. *Journal of Consulting and Clinical Psychology*, 1969, 33(3), pp. 307–316.
22. Mehrabian, A.; Epstein, N. A measure of emotional empathy. *Journal of Personality* 1972, 40(4), pp. 525–543.
23. Marlowe, H.A. Intelligence sociale: preuves de la multidimensionnalité et de l'indépendance de construction. *Journal de psychologie de l'éducation* 1986, pp. 52-58.
24. Riggio, R.E. Assessment of basic social skills. *Journal of Personality and Social Psychology* 1986, 51(3), pp. 649–660.
25. Gardner, H. Multiple intelligences: myths and messages. *The Phi Delta Kappan* 1995, 77(3), pp. 200-203.
26. Beaudichon, J. Effets de la communication interpersonnelle sur le développement de l'intelligence sociale. *Enfance* 1980, 33(4), pp. 122–124.
27. Nadel, J. Le développement de l'intelligence sociale : Les précurseurs de l'intelligence sociale. *Intellectica*, 2002, 34, pp. 143-160.

Citation: Băjenescu, T.-M.I. What is social intelligence? *Journal of Social Sciences* 2022, 5 (3) pp. 39-47. [https://doi.org/10.52326/jss.utm.2022.5\(3\).04](https://doi.org/10.52326/jss.utm.2022.5(3).04).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).05](https://doi.org/10.52326/jss.utm.2022.5(3).05)
UDC 656.1:504(669)



SOCIO-ECONOMIC AND ENVIRONMENTAL IMPLICATIONS OF ROADSIDE AUTOMOBILE WORKSHOPS IN OTA CITY, NIGERIA

Ayobami Ademola Akanmu ¹, ORCID: 0000-0002-9264-5863,
Simeon Oluwagbenga Fasina ², ORCID: 0000-0003-4989-0019,
Umar Obafemi Salisu ^{2*}, ORCID: 0000-0003-1630-3420,
Lukman Adedayo Adeyemo ², ORCID: 0000-0002-2087-1300,
Samuel Oluwaseyi Olorunfemi ³, ORCID: 0000-0002-3218-6562

¹Oke-Ogun Polytechnic, Saki, JCH4+R82, Adoyan Hill, Nigeria

²Olabisi Onabanjo University, Ago-Iwoye, +234, Nigeria

³Federal University of Technology, Akure, +234, Nigeria

*Corresponding author: Umar Obafemi Salisu, umar.salisu@oouagoiwoye.edu.ng

Received: 06. 18. 2022

Accepted: 08. 03. 2022

Abstract. Roadside Automobile Workshop (RAW) activities remain principal components of the informal sector in many Nigerian cities. Its emergence is attributed to the advent of automobiles and their use in easing urban mobility. Expectedly, unlike the formal auto-workshops, the RAW are located across the available spatial places where, motorists find solace to immediately respond to maintenance and other mechanical faults/malfunctions of their vehicles. However, the spatial locations and operations of RAW, along with the accompanying adverse effects, are recurring issues of concern in many cities in Nigeria. In this regard, this study assessed the socio-economic and environmental implications of RAW in the city of Ota, Nigeria. A cross-section survey research is adopted in this study, while 400 residents were sampled using multistage sampling technique. Major findings show that most of the residents have spent over four years in study area. It also revealed that increase loss of green area, noise pollution, and land vibration are the top-ranked environmental implications, while increase road traffic congestion, untrained technicians, and disruption of traffic flow are top-ranked economic implications. However, improve access to maintenance workshop, reduce vehicular breakdown on roads are top-ranked social implications of RAWs. This study concludes that the indiscriminate location of RAWs in the study area is detrimental to socio-economic development of study area ($F_{\frac{10}{389}}23.851, p=0.000<0.05$), and recommends policy implications and strategies to improve the activities of RAW in the study area.

Keywords: Cities, informal sector, perception analysis, transport operations, urban mobility.

Rezumat. Activitățile Roadside Automobile Workshop (RAW) rămân componente principale ale sectorului informal în multe orașe nigeriene. Apariția sa este atribuită automobilelor și utilizării acestora în facilitarea mobilității urbane. Spre deosebire de atelierele auto oficiale, RAW sunt amplasate în locurile spațiale disponibile unde șoferii își găsesc consolare să

răspundă imediat la întreținere și la alte defecțiuni mecanice/defecțiuni ale vehiculelor lor. Cu toate acestea, locațiile și operațiunile spațiale ale RAW, împreună cu efectele adverse însoțitoare, sunt probleme recurente de îngrijorare în multe orașe din Nigeria. În acest sens, acest studiu a evaluat implicațiile socio-economice și de mediu ale RAW în orașul Ota, Nigeria. În acest studiu este adoptată o cercetare în secțiune transversală, în timp ce 400 de rezidenți au fost eșantionați folosind tehnica de eșantionare în mai multe etape. Majoritatea rezidenților au petrecut peste patru ani în zona de studiu. Studiul a arătat pierderi ale zonei verzi, poluare fonică și vibrații ale terenului - implicațiile de mediu de top, în timp ce creșterea congestionării traficului rutier, tehnicienii nepregătiți și perturbarea fluxului de trafic sunt implicații economice majore. Cu toate acestea, îmbunătățirea accesului la atelierul de întreținere, reducerea defecțiunilor vehiculelor pe drumuri sunt implicații sociale de top ale RAW-urilor. Acest studiu concluzionează că amplasarea fără discernământ a RAW în zona de studiu este dăunătoare dezvoltării socio-economice a zonei de studiu ($F_{(10/389)}23,851$, $p=0,000<0,05$) și recomandă implicații politice și strategii pentru îmbunătățirea activităților RAW.

Cuvinte cheie: orașe, sector informal, analiza percepției, operațiuni de transport, mobilitate urbană.

1. Introduction

The development and introduction of automobiles of various categories has not only been a unique succor to socio-economic development of nations across the globe, but also facilitates spatial interaction of people and activities by ensuring ease of movement and comfortable overcoming of spatial barriers. Therefore, the advent of automobiles and its adoption in facilitating movements across spatial location has brought mechanics into limelight and the corresponding establishment of automobile workshops. Mechanics is a relative term with varying meanings. However, the term, mechanics is not only scientifically defining and described by [1] as a branch of physics that is concerned with the motions of objects and their response to forces, but also professionally seen as a skilled worker who is employed to repair or operate machinery or engines in Nigerian context. In this regard, mechanic involves in the application of technical knowledge of mostly acquired informally to solving daily needs of people in automobile maintenance and repairs, most especially in the Roadside Automobile Workshops (RAW).

The RAW no doubt, are spatially located to ensure regular maintenance of various forms and types of automobiles [2]. These workshops, which can be organized/formal or unorganized/informal have been an integral part of land use since the advent of automobile and motorization in the built environment [3]. The automobile or mechanic workshop, as the terms are used interchangeably in literature, is critical to successful operations and maintenance of vehicles, as collision and engine repair, oil change, car wash, and other services are performed there to ensure optimal performance of the vehicles for the owners and other users [4,5]. Therefore, vehicle technicians or mechanics usually attend to faulty vehicles for one form of attention or the other at the workshop. Most importantly, vehicle maintenance, which is the practice of servicing vehicles to prevent major breakdown and repair of damaged or malfunctioning components of a vehicle, is being attended to at such workshop. With increasing demand for vehicles couple with increased vehicle ownership and introduction of other categories of automobiles in the country, the need to patronize automobile workshop become necessary. Thus, visiting or patronizing auto-technicians at

automobile or mechanic workshops has always be a precondition for successful and efficient operations of vehicles since its introduction in Nigeria and other Sub-Sahara African countries.

Apart from maintenance, an automobile service workshop performs several functions, which include sales of automobile parts and vehicles; providing after-sales services and rendering technical advice to customers who patronize their workshops; and having a specific location in the cities where these activities are carried out. Peculiar to Nigeria, the location of formal or government approved automobile workshops are not only few or scanty in number, their location are far from the activities centre and equally characterized by poor condition of access roads, low patronage, insecurity and crime activities [4]. The attributed challenges to organised or formal automobile workshops in the Nigeria gave birth to the proliferations of roadside automobile workshops across various activity centres in Nigeria. Worthwhile, The RAWs are usually located conspicuously along or adjoining roads and streets for easy accessibility and identification by those demanding their services on varying aspects of vehicle components. Interestingly, the spatial location of RAW has been a major concern for many adjourning land use activities considering their adverse effects. Therefore, the location and proliferation of RAW in Nigeria cities deserve urgent attention; hence, this basis for this study with specific focus on the residents perception of the socio-economic and environmental implications of the location and activities of RAW in Ota, Nigeria.

It is worth knowing that the importance of RAW to users of automobiles, and socio-economic development of the country cannot be underestimated. In fact, RAW are part of the Nigeria service industry which meets the immediate and remote needs of various categories of automobile users in the country. This is due to the fact that road transport accounts for the highest share of the modal split with the predominant use of automobile vehicles that rely on petroleum products such as prime motor sprit [PMS] and automotive gas oil [AGO] in the country. Meanwhile, the operational efficiency of these automobile vehicles continue to deteriorate in performance due to the wear-out of spare parts and other related mechanical and electrical faults caused by frequent use, which necessitates repair or replacement. However, the indiscriminate location of automobile workshops and the concomitant release of chemical-related waste, including engine and brake oil, metal scraps, fuel, grease, and radiator steam etc., due to the operational activities of RAW into the surrounding environment are of immense detriment to residents, socioeconomic functions and environmental quality. These consequential effects are of notable disaffection and matter of concern, as attributed hazardous waste in particular are not biodegradable, but toxic and injurious to health as well as other aquatic lives. Meanwhile, the activities of the RAWs in cities have also contributed to the growing urban degradation, slum and sprawl creation. For instance, [5] state that the activities being carried out by auto mechanic operators at different locations of their workshops which are not in compliance with any known standards have resulted in various geo-environmental damage and consequences. In addition, the activities of RAW have not only infiltrated residential areas, but also causing disaffection to residents in such adjoining areas.

The aesthetic quality and arrangement of most urban centres in the country including Ota City, Nigeria is adversely being impacted by uncoordinated existence, and locations of RAW. With this, there is high rate of littering the immediate and adjoining environment with many waste metals and other non-biodegradable substances which ultimately and adversely affect environmental quality of the surrounding in numerous ways. This is in addition to noise

and environmental pollution attributed to workshop operations. Meanwhile, the operators of the formal automobile workshops across Nigeria communities are been encourage to move out of the organized location to start operations in the core urban area where patronage are high but compounding the existing cities challenges especially socioeconomic and environmental adverse effects. As such, the study assessed the perceived socio-economic and environment implications of RAW in Ota City, Nigeria. In achieving this aim, the objectives examined include: the socio-economic status of residents living close to the RAW in Ota City, Nigeria; the nature of the activities of RAW and waste attributed to the operation of RAW in the study area; the social, economic and environmental implications of the operation of RAW; the impacts of RAW activities on socio-economic development; and appraised the statistical locational impact of RAWs on the socio-economic development of Ota City, Nigeria.

1.1 Conceptual and literature review

1.1.1 Conceptual clarification

This study is based on the idea of the informal sector, which is also known as the shadow economy, subterranean economy, on-corporate firms, micro-enterprises, or tiny producers. Furthermore, the informal sector is an unregistered commercial enterprise without a formal structure and organization that includes a significant number of self-employed individuals working in developing nations on small-scale, intensive projects like tailoring, food preparation, trading, and shoe repair, among others. Despite being extremely productive and making a sizable contribution to national GDP, the industry is rarely included in the national employment figures. The informal sector is typically characterized by a low capital output ratio, or a low ratio of capital to production in terms of equipment level.

According to reference [6], the informal sector is a diverse phenomenon that includes a wide range of economic activities that are sometimes ignored by statistics. These activities include all kinds of manufacturing, construction, trade and commerce, repair, and other services. Workers in the informal sector are typically those who do tasks in small businesses run and managed by one or a few people with minimal capital; these tasks are frequently labor-intensive and produce goods and services of low quality but at reasonable prices. In contrast to the formal sector, which consists of larger and more productive manufacturing and commercial enterprises, government departments, education, and public sectors, the informal sector is made up of intermittent part-time workers, hawkers, petty traders, side-walk barbers, casual workers, and handicraft workers.

Reference [7] asserts that because informal sector operations use old, labor-intensive production methods that result in low productivity, they are consigned to the background and classified as a traditional or retarded sector in developing economies. According to [8, 9], the informal sector has grown quickly in most developing countries as a true source of livelihood for between one-third and three-quarters of the urban economically active population. This is because the formal sector has virtually collapsed in many countries, including Nigeria, and employs a sizeable portion of the labor force and maintains the economy. Despite the important function roadside mechanics play in Nigerian urban areas, they are also linked to detrimental environmental effects.

The automotive repair activities has been haphazardly situated within our neighbourhood, so hurting the aesthetic quality of urban vista. This concept is relevant to this study since roadside mechanics are part of informal sector whose service is contributory to the economy of the nations.

1.1.2 Literature review

Cities have always been places that offer better access to services than rural communities since the advent of machines. Specifically, since the 19th century, the automotive industry as well as related industries have expanded quickly over the globe. As automobile industry grows and vehicle ownership increases, the demands for vehicle servicing will correspondingly increase. According to [1], the economic sector is expanding due to the operations carried out in mechanic workshops, which include vehicle repairs, fabrication and paneling of worn-out automobile metal parts, vulcanizing, and painting etc. Additionally, [10] note that the motor vehicle repair and service industry (MVRSI) is a thriving sector with a number of small open-air garages, while the majority of vehicle maintenance and repair work is done by roadside mechanics who also play a significant role in the socioeconomic development of the society by helping car owners keep their vehicles operational at all times. Auto-mechanic workshop clusters play very significant roles in ensuring availability of one-stop shops for automobile repairs as artisans specializing in repairs of various aspects and types of automobiles usually conglomerate within specific geographical locations from where they render different automobile-related repairs and services [11].

Automotive workshops fall under the category of small industries, and they contribute to vehicle maintenance because efficient motor vehicle maintenance is crucial to the economy of any country and improves the effectiveness of transportation services. The requirement to provide services for moving automobiles, which can unexpectedly develop problems and demand immediate attention from specialists, gave rise to the need for auto mechanic workshops in Nigeria. Thus, it is necessary that repair workshops will be built close to the side of the road to provide services to the automobiles. With increasing number of vehicles, many informal auto mechanical workshops are set up. Therefore, automobile repair sector is a major component of informal activities characterizing Nigeria cities. It is worthy to note that, auto mechanic workshops can be divided into medium vehicle repair workshops that deal with the repair, servicing, and maintenance of all medium sized vehicles, such as mini-buses, delivery vans, land rovers, etc., and heavy vehicle repair workshops that deal with the repair, servicing, and maintenance of all heavy vehicles. [10] noted that urban land uses have always been left to the dictates of artisans and technicians who take decision on where their activities locate and function even at the expense of other land users. As a result, the automobile artisans that can be found in every nook and cranny of cities portend environmental problems that must be recognized and addressed. This is due to the fact that, despite the flaws of automobile technicians and RAW, they are essential informal sector service activities that are desirable in urban settings.

In the same vein, [12] observe that a typical auto shop employed a range of craftspeople, including mechanics, panel beaters, battery chargers, and spray painters in addition to a number of semi-autonomous car shops that ran in concentric circles and each specialized in one or more vehicle or component brands. The historical background development of formal automobile repair and maintenance industry dated back to 1920 in Lagos. Its expansion started with the creation of the Vehicle Assembly Plant (VAP) in 1959, which is now known as General Motors Limited, to assemble trucks from semi-knocked down components. After that, several businesses, including Leventis, RTB, Briscoe, and SCOA, made investments in Nigeria's auto industry. The private sector made some haphazard attempts to construct cob on truck chassis during this time using flat sheets of metal and wood. When it

supported the establishment of Nigeria's first two auto assembly plants, Volkswagen of Nigeria (VWON) in Lagos and Peugeot automobile Nigeria (PAN) Limited, in Kaduna, in 1970 as part of the Second National Development Plan (1969-1974), the Federal government made its first direct investment in the automobile industry. The Third National Development Plan came next (1975-1980). This includes the National Truck Manufacturers (NTM) Limited Kano, Leyland Nigerian Limited Ibadan, Steyr Nigerian Limited Bauchi, and Anambra Motor Manufacturing Company (ANAMCO) Limited Enugu. These were in charge of educating car mechanics in Nigeria, who went on to become industry professionals in servicing and maintaining of automobiles in the country. For effective operation on Nigerian roads, broken down vehicles were repaired by Nigerian experts between the latter half of the 1970s and the middle of the 1980s, according to [2], but the auto repair industry only really took off in the 1980s, when the country's economy started to suffer for many Nigerians. For client convenience, businesses have been setting up shop along the sides of the road. Since there are no formal procedures for repairs of reported flaws, the rising activities of roadside mechanics have resulted in significant patronage by many Nigerians.

Giving the deterrent nature of RAW, [13] examined the effects of informal auto-mobile mechanic workshops activities on groundwater quality in Ibadan, Nigeria and found the existence of detrimental effect of such activities through the contamination of groundwater sources; hence, the indiscriminate location of such activities become a major public health concern. Also, the study of [12] revealed the concentrations of heavy metals in the soils and high pollution of the surrounding environment of the workshops with heavy metals such as lead and copper among others. In further and related study, [11] found that high contamination of the soil and therefore, call for regular monitoring the activities of auto-mechanics as part of remedial measures.

According to reference [4], there are clusters of auto-repair employees in Ibadan, Oyo State, with three of these clusters located in Ibadan North, two in Ibadan Southwest, and one in Oluyole. Although the properties on which these clusters are located are rented from either public (such as the Nigerian Railway Corporation) or private entities, the clusters themselves are privately owned. In light of this, the distribution pattern is consistent with the local government areas' populations, and there are no known concentrations of mechanics and other vehicle repair personnel in the city's local governments of Ibadan North-East and Ibadan South-West. This is due to a 1984 instruction that auto-repair employees should relocate to the existing clusters, which caused a lot of mechanics in these local governments' territories to do so.

2. Materials and Methods

2.1 Study area

The geographical scope of this study is restricted to the city of Ota in Ogun State, Nigeria. Importantly, the study is restricted to informal automobile workshops known as roadside mechanic workshops in which perceived socio-economic and environment implications of RAW in Ota City, Nigeria was studied as a strategy to evolve required data for planning for mechanic workshop in the study area and other large urban centres in the country. The city of Ota, which has an area of 878 square kilometers and is located between latitudes 6° 41'N and 6° 68'N and longitudes 3° 41'E and 3° 68'E [14], has been one of Ogun State's fastest-growing regions and is included as one of the state's Development Pressure Areas by the Ogun State Regional Plan. Ota, which is in Ogun State, is the third-most

industrialized city in the Nigeria due to its industrial concentration, behind Ikeja and Apapa in Lagos State. Notably, the industrial concentrations in Ota have served as an enticing magnet for people as a result of their closeness to Lagos and the Nigeria/Benin Republic border as well as their concentration of industrial businesses (Figure 1).

The traditional core area, the transition area, and the growing suburb areas make up the three divisions of the Ota built-up area. The traditional core area is divided into four quarters: Ijana, Otun, Osi, and Oruba. It is bordered to the north by Idiroko Road, which splits it in half, and to the south by Iganmode Road. Housing Corporation Estate, the Industrial Estates, and Sango are all part of the transition area, which is the newly constructed region to the north and west of the bypass (grow as residential area for the non-Yoruba community, particularly the Hausas and Ebiras). However, it is noteworthy that some former separate villages that include Ijoko, Ijako, Iloye and Iyesi etc. have merged into one built-up area of Ota [15].

The rapid growth of population is one of the major environmental issues not only in Ota city, but in all major towns and urban centres in Ogun State and other states in the country. This has been the prime cause of other environmental concerns and issues generally in the country as it has multiplier impacts on other socio-economic and environmental variables. The difficulty of sustainable development arises from both the growing population and the deteriorating environment since the presence or absence of advantageous natural resources can hasten or impede the process of socioeconomic growth. Three fundamental demographic factors—the birth (fertility) rate, death (mortality) rate, and human migration (emigration or immigration)—have been creating small variations in RAW population size, composition, and distribution in the city of Ota. The proximity of the City to Lagos region, concentration of tertiary institutions, industries and factories and the linkages with Benin-Republic have also been a cogent contributory factor aiding the spatial location of RAW in the study area.

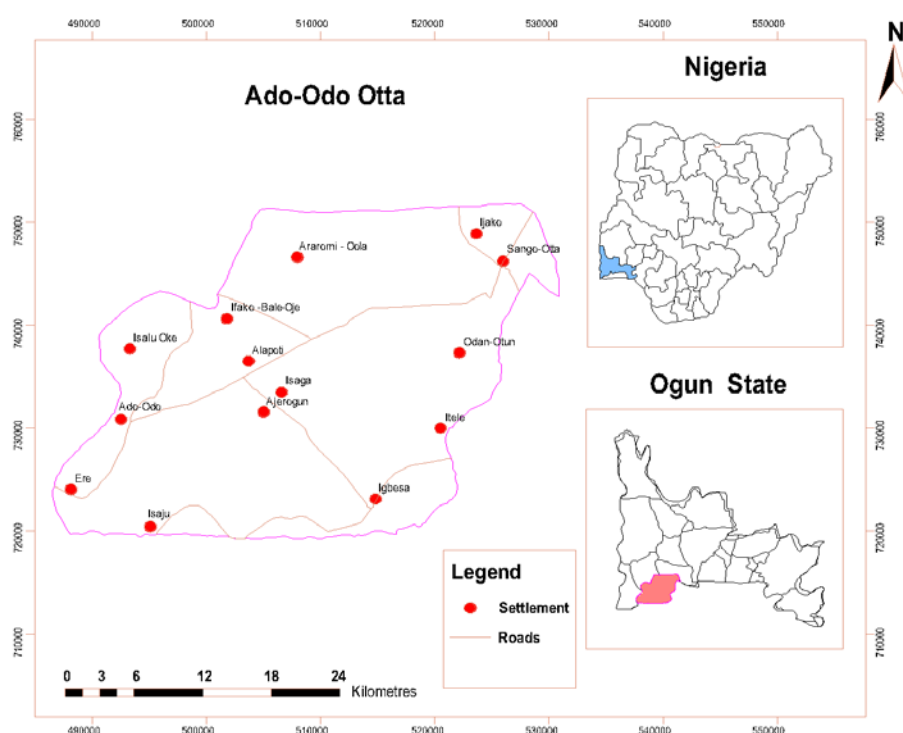


Figure 1. The city of Ota within the context of Ogun State, Nigeria [16].

2.2 Methods

A cross-sectional survey research design was used for the investigation. To implement the cross-sectional research design, this study utilized quantitative research approach which combines both descriptive and inferential statistics. Both primary and secondary sources are used to gather data for this investigation. The study's principal primary sources include two sets of questionnaires administered to household representatives who live around the RAW and the automobile technicians who are representatives of the RAWs in the study area. In other words, two groups of respondents were engaged to achieve the study objectives. The first set of questionnaire administered on the residents or household representatives adjoining the RAWs addressed four study objectives that include: the socio-economic status of residents living close to the RAW in Ota City, Nigeria; the social, economic and environmental implications of the operation of RAW; the impacts of RAW activities on socio-economic development; and the statistical locational impact of RAWs on the socio-economic development of Ota City, Nigeria. While the objective on the nature of the activities of RAW and waste attributed to the operation of RAW in the study area was addressed by the second set of questionnaire administered on the representatives of the RAWs in the study area.

The study population include the total number of people residing in Ado-Odo/Ota LGA, estimated at 247,601 people (both male and female) and the RAW (estimated as 33) found in all sixteen political wards (Ota I, Ota II, Ota III, Sango, Ijoko, Atan, Iju, Ilogbo, Ado Odo I, Ado Odo II, Ere, Alapoti, Igbesa, Agbara I, Agbara II and Ketu based on the 2006 National Population Census results). Both probability (multistage sampling technique) and non-probability (purposive sampling techniques) were employed in this study. The multistage sampling technique the combine stratified, random, and systematic sampling techniques was used in sampling the residents. First, the human population of study area "Ota City" was divided into political wards authorized by the Federal Government of Nigeria based on the 2006 population census using stratified sampling. In this regard, the sixteen political wards in the study area formed the stratus and only the residential housing units found within 1000 meters adjoining the RAWs in each strata were captured for this study. In this study, a representative of a household was chosen as the respondents from the selected residential buildings. At the second stage, random sampling was used to select the first building in each strata "political ward", ensuring that each building had an equal chance of being chosen. At the third stage, systematic sampling was used to select every tenth building after the first was randomly selected until the sample size for the study was reached. In other words, residents living within 1000 meters of RAW were sampled using Taro Yamani's Sample Formula [$n = N / (1 + N(e)^2)$] based on Ado-Ota's 2020 population (247,601). However, a total of 400 residents who are landlords or household representative that live within 1000meters radius of the RAW makes up the sample size for the first group of respondents. On the hand, two (2) topmost technicians in each of the 33 RAWs as representatives in the study area were purposively sampled and a total of sixty-six (66) accounted for the sample size for the second group of respondents who are RAW technicians.

The methods of data analysis employed in this study include both inferential analytical and descriptive methods. The descriptive methods include frequency percentage tables, charts and Relative Mean Index (RMI) appropriately and in relation to the data obtained with the questionnaires. Specifically, data collected through 4 -point Likert's scale was analysed descriptively by using the Sum of Weighted Values (SWV) to estimate the RMI for individual dataset. The RMI value for each variable was thus calculated by dividing SWV by the total

number of responses, whereas the SWV for a variable is then calculated by adding the product of the number of responses to each aspect and the respective weight value attached to each rating [17]. The analysis is mathematically expressed as follows:

$$SWV = \sum_{i=1}^4 X_i Y_i, \quad (1)$$

where:

SWV = Summation of Weight Value.

X_i = number of response rating i .

Y_i = the assigned weight value ($i = 1, 2, 3, 4$).

$$RMI = \frac{SWV}{\sum_{i=1}^4 i = X_i} \quad (2)$$

Inferentially, the hypothetical statements which states that the location of RAW does not have a significant impact on the socio-economic development of Ota was analysed using Regression Analysis towards establishing the extent of relationship between dependent and independent variables. Nevertheless, for the hypothesis testing, the dependent variable (location of RAWs) was measured using quantitative data while the independents variables (socio-economic development factors) were measured using quantitative data which was transform from the qualitative data based on the perception of the residents. However, the qualitative data was transformed to quantitative data using binary dichotomous (0 and 1) variable in other to allow the model application in testing and analyzing the study hypothetical statement. In other words, Statistics Package of Social Science SPSS IBM version 21 was engaged for analysis and presentation of data.

3. Results

3.1 Socio-economic status SES of residents living close to the RAW

The results of data analysis and presentation on various issues relating to the study objectives are presented this sub-section. It is in this view that this subsection presents the results of data collected and analysed on many socioeconomic parameters including respondents' sex, age, highest educational qualification, income, occupation, and household size among others are mostly explained in descriptive format. It is interesting to state that close to three-quarter (73.8%) of residents administered with the questionnaires are female as presented in Figure 2. Also, almost a quarter (26.2%) is male. With this, it is not a co-incident that females who were met at home responded to the administered questionnaires than their male counterparts who are mostly out of home in order to cater for their families.

With respect to the age distribution of residents in the adjoining areas to RAW, the results of data collected and analyzed presented in Figure 3 shows that only 4.2% are below 20 years of age, slightly less than a quarter (21.1%) is between 20 and 30 years, while more than one-tenth (18.8%) is between 31 and 40 years. Likewise, more than one-third (35.2%) is between 41 and 50 years, more than one-tenth (15.2%) is between 51 and 60 years, while the remaining 5.5% accounts for

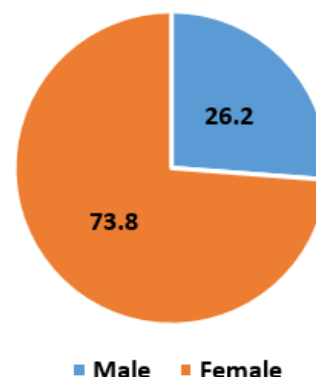


Figure 2. Gender distribution of residents.

Source: Authors' field survey, 2021.

those that is above 60 years of age. It can be deduced from this results that the residents within the working age dominated areas adjoining RAWs and as such, are capable of expressing their views on the implications of the activities in the workshops on their livelihood in the area.

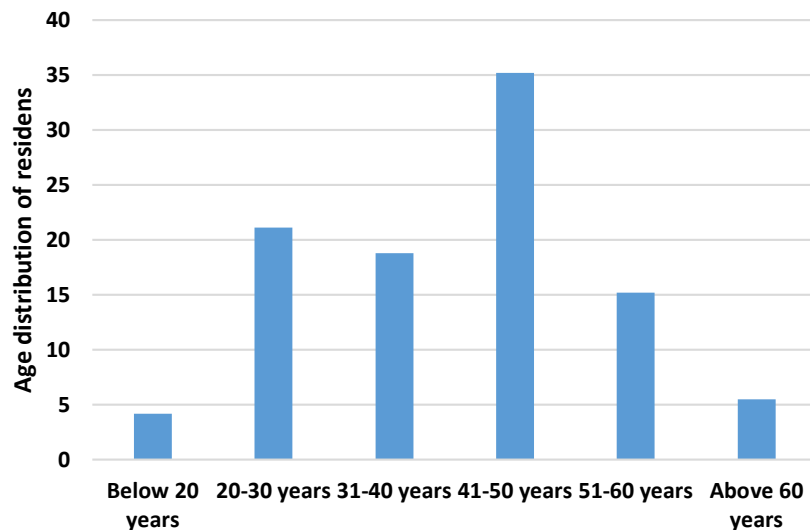


Figure 3. Age distribution of residents.

Source: Authors' field survey, 2021.

On the highest educational attainment of residents, Figure 2 shows that only 4.2% do not has formal education among the sampled residents. Also, slightly more than one-third (32.8%) has education at primary level, while exceedingly greater than one-third (39.2%) has secondary education. In addition, residents with tertiary level accounts for 19.2%, while 4.5% has other unclassified educational level (adult education) among the residents surveyed in the area of study. With this, it can be deduced that residents are mostly literate and dominated by those with formal education level as only a less significant of them has no formal education experience.

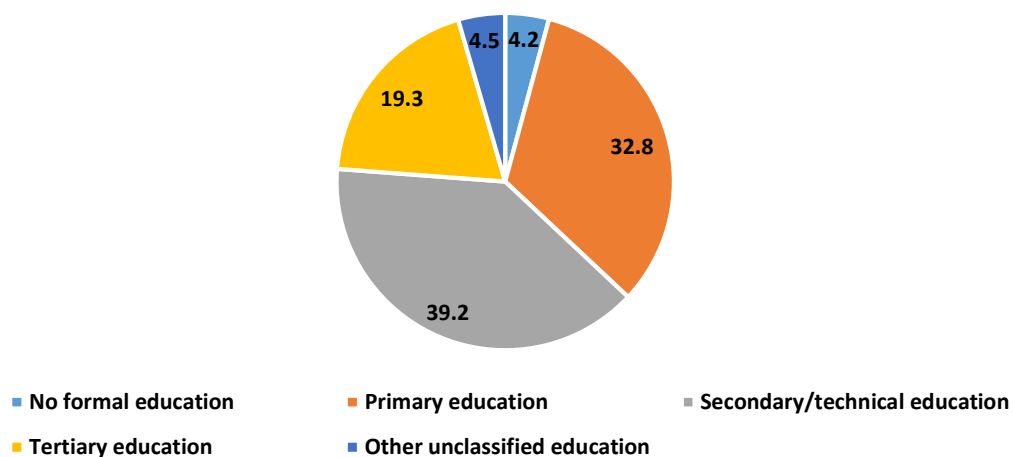


Figure 4. Highest educational qualification.

Source: Authors' field survey, 2021.

The data obtained and analyzed on marital status of respondents revealed in Table 1 that more than one-tenth (18.2%) is single, while close to three-quarter (73.8%) is married.

Furthermore, while 7.0% is not living with their partners as they are divorced, the remaining 1.0% is widow. It can be deduced from this analysis that respondents in the study area are mostly married and possibly has accompanying socio-economic engagements being carried out to cater for their families.

Table 1

Respondents' marital status		
Status	Frequency	Percentage
Married	295	73.8
Single	73	18.2
Widow	4	1.0
Divorced	28	7.0
Total	400	100.0

Source: Authors' field survey, 2021.

With respect to the household size of respondents, Table 2 shows that less than a quarter (17.5%) has less than 2 persons as household size, while close to half (47.8%) has between 2 and 4 persons as household size. Also, less than one-third (28.5%) has between 5 and 8 persons in their household, while the remaining 6.20% has more than 8 persons as household size. This result shows that respondents are not only married but also have dependents to cater for as household size varies and exceed three persons in most instances.

Table 2

Household size of residents		
Range of size	Frequency	Percentage
Less than 2 persons	70	17.5
Between 2 and 4 persons	191	47.8
More than 8 persons	25	6.2
Between 5 and 8 persons	114	28.5
Total	400	100.0

Source: Authors' field survey, 2021.

The occupational characteristics and engagements of respondents vary significantly as Table 3 reveals that only 15.8% are dependents inform of being students/apprentice, while close to half (44.5%) engages in personal businesses. In addition, the civil/public servants account for 5.2% among the respondents, while almost one-third (32.5%) engages in private employment and the remaining 2.0% belong to other unclassified occupation for being inactive in public services as they have retired for government works. This analysis revealed that residents are engaging in socio-economic undertakings that bring varying rewards for the sustenance of their families.

Table 3

Occupational characteristics of residents		
Occupation	Frequency	Percentage
Apprentice/student	63	15.8
Personal business	178	44.5
Civil/public servant	21	5.2
Private employee	32.5	32.5

Continuation Table 3

Others (retiree)	8	2.0
Total	400	100.0

Source: Authors' field survey, 2021.

The information on average monthly income of respondents presented in Table 4 revealed that close to one-tenth (9.0%) earns below NGN 18,000, while slightly more than one-tenth (11.5%) earns average income of between NGN 18,000 and NGN 40,000 per month. Likewise, slightly more than one-third (34.8%) received between NGN 41,000 and NGN 60,000 as monthly income, while 22.2% earns between NGN 61,000 and NGN 80,000. The remaining 22.5% are those who earn more than NGN 80,000 per month on average basis among the sampled respondents. With this result, it is clear that sampled resident is among the acclaimed low income people in the city.

Table 4

Respondents' monthly income (Nigerian Naira NGN)

Range	Frequency	Percentage
Below NGN 18,000	36	9.0
Between NGN 18,000-NGN 40,000	46	11.5
Between NGN 41,000-NGN 60,000	139	34.8
Between NGN 61,000-NGN 80,000	89	22.2
More than NGN 80,000	90	22.5
Total	400	100.0

Source: Authors' field survey, 2021.

Residents are not stranger to the happenings in their adjoining environment as the data analyzed of period of residing in the area as Table 5 shows that only 16.2% is below 4 years in the area. Also, less than one-quarter (20.2%) have been staying in the city for a period between 4 and 8 years, while close to one-quarter (23.5%) has between 12 and 16 years of living experience in the area. The remaining 2.5% has spent beyond 16 years in the area of study. This result established the fact that residents are not stranger, but have been living in the study area for a longer period that exceeds 4 years denoting their ability to x-ray the happening in the city of Ota with respect to the implications of the operations of road side mechanics.

Table 5

Period of residency in the area

Period	Frequency	Percentage
Below 4 years	65	16.2
Between 4 and 8 years	81	20.2
Between 9 and 12 years	150	37.5
Between 13 and 18 years	94	23.5
More than 18 years	10	2.5
Total	400	100.0

Source: Authors' field survey, 2021.

3.2 Nature of the activities of RAW and waste attributed to the RAW operations

Nature of the activities of RAWs at close proximity to them were asked, and the type of waste generated to the adjoining environment. With respect to the nature of activities of

the RAW, Table 6 revealed that vehicle technician dominates the workshops accounting for close to three-quarter of the activities of the RAW (60.6%). Also, 9.1% of respondents sampled are involved in pane beating/fabrication, while one-tenth (10.9%) is into automotive wiring/rewiring. Also, it is observed that less than one-tenth (7.6%) involved in the repairing of fuel injector/carburetor of different vehicles, while the remaining 12.1% involves in vehicles' upholstery and related activities. In this vein, there seem to be general misconception on what constitute RAWs. Based on this finding, it is clear that a typical RAW is a collection or aggregation of various technicians with each specializing in different component of vehicles, but embraced the principle of agglomerations.

Table 6

Nature of work of the sampled mechanics		
Nature	Frequency	Percentage
Vehicle technician	40	60.6
Panel beating/fabrication	6	9.1
Automotive wiring/rewiring	7	10.6
Injection/carburation	5	7.6
Upholstery	8	12.1
Total	66	100.0

Source: Authors' field survey, 2021.

In addition, data obtained on the nature of waste associated with waste from the activities of RAWs were analysed on four point Likert's scale with gradation consisting of Very High (VH= 4), High (H=3), Low (L=2) and Very Low (VL=1). Using "Eq. (1)" and "Eq. (2)", the SWV is estimated to be 22.2475 for the seven indicators, while the RMI is 2.3889 with the detailed result presented in Table 7. Accordingly, scrap metals and used tires are the most disturbing issue associated with the mechanic workshops in the study area as its relative index value of 3.2121 exceeds the mean index value [MIV] of the entire analysis. Also, paint and spray materials are ranked second with MIV of 2.9545, while used oil and oil filters (2.7727) are ranked third among the waste products identified. In addition, abandoned vehicles and vehicle parts (2.7576) are another waste product that has substantial adverse implications not only within the premises of the workshop but extending to the adjoining streets and area of mechanic workshops, while rubber/plastic and other ignitable waste (2.667) cannot be excluded among the nature of waste associated with RAWs in the study area. However, stripping compound and wastewater, wire and toxic metals, grease and solvent wastes, diesel/petroleum distillates are other waste products associated with mechanic workshop but of less significance to this study since their RIM are far less than MIV of the entire analysis.

Table 7

Nature of waste associated with waste from the activities of RAWs								
Variables:	VL	L	H	VH	TWV	RMI	MIV	RK
Scrap metals and used tires	0	6	138	68	212	3.2121	2.3889	1
Used oil and oil filters	9	24	90	60	183	2.7727		3
Grease and solvent waste	38	56	0	0	94	1.4242		8
Diesel/petroleum distillate	49	34	0	0	83	1.2576	2.3889	9
Abandoned vehicle/vehicle parts	4	36	102	40	182	2.7576		4
Paint and spray materials	1	24	126	44	195	2.9545		2

Continuation Table 7

Wire and toxic metals	17	64	42	16	137	2.0758	7
Rubber/plastic and other ignitable waste	3	38	123	12	176	2.6667	5
Stripping compounds/wastewater	15	28	102	12	157	2.3788	6

Source: Authors' computation, 2021.

Note: VL- Very Low, L- Low, H- High, VH- Very High, TWV- Total Weight Value, RMI- Relative Mean Index, MIV- Mean Index Value, RK- Rank.

Data collected on the residents' perception of the operators of RAW method of waste disposal was analysed and result presented in Table 8. In this respect, it is observed that nearly half of respondents (48.5) allowed scavenger to pick the waste materials in their workshops, while more than one-third (35.4%) dumps waste into available open spaces. Likewise, 3.0% of respondents make use of landfill created by them for piling their waste, while the remaining 12.1% makes use of government waste disposal facility and approved landfill. This result shows that little attention is being accorded to waste disposal and hygienic environment in the mechanic workshops; hence, the need to evolve strategy to improve general sanitation practices at RAWs in the area.

Table 8

Waste disposal method in the mechanic workshops		
Methods	Frequency	Percentage
Scavenger/waste pickers	32	48.5
Open dump	24	35.4
RAW created landfill	2	3.0
Government waste disposal facility	8	12.1
Total	66	100.0

Source: Authors' field survey, 2021.

Note: RAW – Roadside Automobile Workshop.

In other words, residents were asked about the performance of the regulating bodies in charge of monitoring and regulating the activities of the automobile engineers and workshops.

The results which were measured on four point Likert's scale with gradation values that consist of Always (A= 4), Sometimes (S=3), Rarely (R=2), and Never (N=1) in line with "Eq. (1)" and "Eq. (2)" produced SWV of 10.465 for the six indicators RMI of 1.744166.

The detailed information on these findings are presented in Table 9 revealed that the operators of the RAWs always addresses the residents' complaint based on the activities of RAWs in their residences considering the highest relative index of 2.9125 of this source. Follow by the community association (2.2250), National Automobile Technicians Association (NATA) and nearby Town Planning Authority in their jurisdiction.

In the same vein, Police formation and National Environmental Safety Regulation and Enforcement Agency (NESREA) were never ready to address the complaints lodged by the residents based on the excesses of RAWs.

With this, it is evident that majority of the possible regulators in-charge of monitoring and regulating the activities of RAWs failed to respond to the resident complaints on the unpleasant externalities associated with informal mechanic workshops in the study area.

Table 9

**Response by residents' complaints by the regulating bodies' in-charge of
monitoring and regulating the activities of the RAW**

Variables:	N	R	S	A	TWV	RMI	MIV	RK
Town Planning Authority	281	170	69	44	564	1.4100	1.7442	4
NESREA	335	84	66	4	489	1.2225		6
Operators	52	36	729	348	1165	2.9125		1
Police/NSDC	335	76	81	0	492	1.2300		5
Community association	86	318	402	84	890	2.2250		2
NATA	230	308	64	0	586	1.4650		3

Source: Authors' computation, 2021.

Note: N- Never, R- Rarely, S- Sometimes, A-Always, TWV- Total Weight Value, RMI- Relative Mean Index Mean, MIV- Mean Index Value, RK- Rank; NESREA – National Environmental Standards and Regulations Enforcement; NSDC – Nigeria Security and Civil Defence Corps; NATA - Nigeria Automobile Technicians Association.

3.3 Social, economic and environmental implications of the operation of RAW in Ota City

The social implications of the operations of RAW activities in Ota city were examined from the perspectives of residents in the adjoining area. The data was evaluated on 4-point Likert's scale with gradation value that consist of Very High (VH= 4), High (H=3), Low (L=2) and Very Low (VL=1). In line with "Eq. (1)" and "Eq. (2)", Table 10 shows the detailed results of the analysis in which the SWV and RMI estimated were 19.0025 and 2.7146 respectively for the seven variables measured. A critical evaluation of the results in Table 10 revealed that improved access and nearness to automobile workshops (3.4275), reduction in vehicular breakdowns on the roads (3.1875) and prompt response to malfunction vehicles on transit (2.9025) are the top rated social implications of the operations of the RAW in the city. Also, the results also revealed the encouragement of crime and fear of crime (2.6700) and encouragement of security breaches (2.6100) which deserve urgent attention are social consequences of the RAWs activities in the study area.

Table 10

Social implications of the operation of RAW in Ota City

Variables	VL	L	H	VH	TWV	RMI	MIV	RK
Improve access and nearness to automobile workshop	3	50	510	808	1371	3.4275	2.7146	1
Reduce vehicular breakdowns on roads	49	66	336	824	1275	3.1875		2
Encourage crime and fear of crime	55	284	249	480	1068	2.6700		4
Encourage security breaches	53	320	231	440	1044	2.6100		5
Prompt responses to malfunctioning vehicles on transit	95	110	132	824	1161	2.9025		3
Encourage prompt vehicular maintenance and services	217	46	219	348	830	2.0750		7
Enhances operational efficiency of vehicles	208	46	234	364	852	2.1300		6

Source: Authors' computation, 2021.

Note: VL- Very Low, L- Low, H- High, VH- Very High, TWV- Total Weight Value, RMI- Relative Mean Index, MIV- Mean Index Value, RK- Rank.

However, the findings showed that the operations of RAW do not encourage prompt vehicular maintenance and services and has less impact on the operational efficiency of vehicles. Considering these results, it can be deduced that various activities of Raw in Ota city has substantial social implications on the adjoining residents in the area.

Another analysis of the study is on the economic implications of the operations of RAW activities in Ota city. This was also assessed from the perspectives of residents in which he collected data was analyzed in line with “Eq. (1)” and “Eq. (2)” presented in the methodology. The results of this analysis presented in Table 11 has a total weighted sum value of 20.4175 and Mean Index Value of 2.9168 for the seven variables assessed. Accordingly, the results revealed that the top rated economic implications of RAW include encouragement of road traffic congestion and safety (3.3425), encouragement of untrained technicians (3.2250), disruption of free flow of traffic (3.0950) and facilitation of ancillary commercial activities (2.9700). However, the remaining variables which consist of improved annual expenditure of transport (2.7725), improved vehicle maintenance cost (2.6075) and encouragement of road traffic crash are of fairly reported economic implications. With these analysis, it can be deduced that the operations of RAW in the City has substantial economic consequences and implications on the city and the residents.

Table 11

Economic implications of the operation of RAW in Ota City

Variables	VL	L	H	VH	TWV	RMI	MIV	RK
Disruption of free flow of traffic	71	50	297	820	1238	3.0950	2.9168	3
Facilitation of ancillary commercial activities	86	6	444	652	1188	2.9700		4
Improve vehicles maintenance cost	91	102	546	304	1043	2.6075		6
Encourage untrained technicians	49	64	297	880	1290	3.2250		2
Improve annual expenditure on transport	134	2	261	712	1109	2.7725		5
Encourage road traffic congestion and delay	24	78	339	896	1337	3.3425		1
Encourage road traffic crash	94	144	616	88	962	2.4050		7

Source: Authors' computation, 2021.

Note: VL- Very Low, L- Low, H- High, VH- Very High, TWV- Total Weight Value, RMI- Relative Mean Index, MIV- Mean Index Value, RK- Rank.

Furthermore, the environmental implications of the operations of RAW activities examined from the perspectives of residents was analyzed in line with “Eq. (1)” and “Eq. (2)” presented in the methodology. Details of this analysis are presented in Table 12 and the findings revealed a total weighted sum value of 22.6975 and Mean Index Value of 2.8372 for the eight indicators used. In other words, the results of the analysis shows that the five (5) environmental variables that highly significant are encouragement of loss of vegetation and green area (3.4825), increased noise pollution (3.3025), increased land vibration (3.2250), encourage land encroachment (3.0950), and increased vehicular emission (2.8450). In slight variation to the above results, it is also observed that increasing released of toxic compounds and greenhouse gases (2.7450), encourage poos sanitation (2.5225) and increased water contamination (1.4825) are of less environmental consequences occasioned by the operations of RAW in Ota city.

Table 12

Environmental implications of the operation of RAW in Ota City								
Variables:	VL	L	H	VH	TWV	RMI	MIV	RK
Increases noise pollution	15	136	294	876	1321	3.3025	2.8372	2
Increases the release of toxic compounds and greenhouse gases	69	14	843	129	1098	2.7450		6
Increase vehicular emissions	105	0	441	592	1138	2.8450		5
Increase water contamination	272	150	126	44	592	1.4800		8
Encourage loss of vegetation and green area	13	0	504	876	1393	3.4825		1
Encourage poor sanitation	143	36	378	452	1009	2.5225		7
Increases land vibration	49	64	297	880	1290	3.2250		3
Encourage land encroachment	71	50	297	820	1238	3.0950		4

Source: Authors' computation, 2021.

Note: VL- Very Low, L- Low, H- High, VH- Very High, TWV- Total Weight Value, RMI- Relative Mean Index, MIV- Mean Index Value, RK- Rank.

3.4 RAW activities and socio-economic development of Ota City

This sub-section presents the analysis on perceived impact of RAW activities on the socioeconomic development of the study area. Residents adjoining RAWs are asked about the proximity of their house to RAW and their perception of the possible contribution of the activities of the roadside automobile workshop on the socio-economic development of Ota City were analysed. Findings presented in Table 13 shows that most (55.0%) of the sampled residents live within 1km to 3km radius of the RAW, 37.5% of the residents reside within 3.1km to 5km radius, less than one-quarter of the residents live within the proximity of less than 1km radius of RAW and the remaining 12.5% residents reside in a proximity of above 5km radius of the RAW. By implication, most of residents found the activities of RAW in close proximity to them.

Table 13

Proximity of residents to RAW		
Location	Frequency	Percentage
Less than 1km radius	80	20.0
1km - 3km radius	220	55.0
3.1km - 5km radius	150	37.5
Above 5km radius	50	12.5
Total	400	100.0

Source: Authors' field survey, 2021.

Analysis on the contribution of the RAW activities on the socio-economic development of Ota City were achieved based on the principles of "Eq. (1)" and "Eq. (2)" in the methodology and the estimated SWV and RMI presented in Table 14 revealed 22.3 and 2.2300 respectively. Accordingly, the results shows that RAWs have positive impact on the trade and commerce in various dimensions in the adjoining area with highest RIM of 3.1875. This is closely followed by insecurity and crime which has index value of 2.8875 denoting the adverse impacts of the activities of RAWs in the adjoining area as residents are of the opinion that such workshop is capable of compromising their safety and security in the neighbourhood. In addition, the tendency of increasing waste accumulation in the adjoining community is ranked third (2.8225) considering the facts that mechanic workshops do generate substantial

but unquantified waste of various forms and nature. However, the results of the analysis equally underscores the importance of roadside mechanic to industrial productivity (2.4300) as industries in Ota equally benefit from such services rendered by RAWs most especially, for emergency repair of malfunction vehicles in transit.

Also, continuous mobility and access to transport services is another positive socio-economic and environmental implications of RAWs as this is ranked fifth with index value of 2.4050. In contrast, it is regrettable that RAWs failed to promote peaceful coexistence and interpersonal relationship with residents in adjoining communities as this has index value of 2.2025, thereby ranked sixth. More so, operators of RAWs rarely leave their workshops to attend to breakdown vehicles (service responsiveness) on the road as shown by the index value of 1.8800 estimated for this variable. Also, attraction of labour force to the area which has index value of 1.777 and housing demand (1.5525) as the workshops rarely increase housing demand in the adjoining area. Last, it is regrettable that roadside mechanics do not add value to aesthetic quality of the area. In this wise, the workshops and the ways vehicles are parked on the streets and adjoining areas are eyesore to the residents and those passing by.

Table 14

RAW activities and Socio-economic development of Ota City								
Variables:	P	F	G	VG	TWV	RMI	MIV	RK
Housing demand	228	238	159	0	625	1.5625	2.2300	9
Trading & commerce	49	66	336	824	1275	3.1875		1
Peaceful coexistence	101	234	546	0	881	2.2025		6
Labour force	199	266	87	156	708	1.7700		8
Mobility & accessibility	94	144	636	88	962	2.4050		5
Insecurity & crime	46	98	627	384	1155	2.8875		2
Industrial productivity	114	102	552	204	972	2.4300		4
Waste accumulation	46	126	621	336	1129	2.8225		3
Service responsiveness	143	326	297	4	752	1.8800		7
Community aesthetic	339	121	0	0	461	1.1525		10

Source: Authors' computation, 2021.

Note: P-Poor, F-Fair, G-Good, VG- Very Good, TWV- Total Weight Value, RMI- Relative Mean Index, MIV- Mean Index Value, RK- Rank.

3.5 Hypothesis testing (regression analysis of locational impact of RAWs on socio-economic development of Ota, Ogun State)

Table 15 reveals the results of regression analysis of the extent of locational impact of RAWs on the socio-economic development of the study area. The F-ratio of ANOVA in the regression analysis reveals 23.851 and the calculated significant value as 0.000 (Table 14). It is clear from the results presented that the calculated significant value ($p=0.000$) is less than the table significance value (0.05). Therefore, we reject null hypothesis (H_0) and accept alternative hypothesis (H_1). By implications, there exist a relationship between of the location RAWs and the socio-economic development of Ota. Furthermore, the regression model through the result of the Adjusted R square shows about 40% explained variation. This means that the socio-economic development factors (independent variables) were able to moderately (about 40%) predict and explain the location of RAWs (dependent variable). The unexplained variation might be due to nature of the data used.

Table 15

**Result of the regression analysis of locational impact of RAWs
on socio-economic development of Ota, Ogun State**

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.617 ^a	0.380	0.364	0.35129

a. Predictors: (Constant), community aesthetic, trade and commerce, peaceful coexistence, labour production, industrial output, insecurity and crime, accessibility, waste accumulation, service responsiveness, housing demands

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1					
Regression	29.433	10	2.943	23.851	0.000 ^b
Residual	48.004	389	0.123		
Total	77.437	399			

a. Dependent Variable: nearest location of workshops

b. Predictors: (Constant), community aesthetic, trade and commerce, peaceful coexistence, labour production, industrial output, insecurity and crime, accessibility, waste accumulation, service responsiveness, housing demands

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1					
(Constant)	1.903	0.168		11.297	0.000
housing demand	-0.220	0.033	-0.358	-6.774	0.000
trade and commerce	0.066	0.019	0.155	3.441	0.001
peaceful coexistence	-0.160	0.023	-0.296	-6.964	0.000
labour production	0.082	0.022	0.177	3.656	0.000
mobility and accessibility	-0.120	0.022	-0.248	-5.565	0.000
insecurity and crime	-0.015	0.021	-0.031	-0.727	0.467
industrial output	0.178	0.019	0.418	9.224	0.000
waste accumulation	0.024	0.022	0.049	1.085	0.278
service responsiveness	-0.057	0.028	-0.099	-2.074	0.039
community aesthetic	0.100	0.058	0.082	1.718	0.087

a. Dependent Variable: nearest location of workshops

The results also showed that out of the nine predictors, seven (7) predictors (independent variables) best predicted the model. That is, housing demands ($p=0.000$), trade and commerce ($p=0.001$), peaceful coexistence ($p=0.000$), labour production ($p=0.000$), mobility and accessibility ($p=0.000$), industrial output ($p=0.000$), and service responsiveness ($p=0.039$) significantly determine and predict the existence of mechanic workshops in the study area (dependent variable). Hence, this finding implies that every unit change in the location of RAWs would be about unit change in the socio-economic development and thus the overall socioeconomic development of the study area "Ota".

4. Discussion

There are obvious socio-economic and environmental implications of RAW observed in the city of Ota. In a bid to justify that, major findings were discussed with reference to the literature. On the socio-economic status, residents sampled at home are observed to be characterized by different gender structures with the female gender dominated the responses received, indicating that female gender at mostly found at home when the male counterpart

are always found away from home in search of resources to cater for the family in a typical Nigerian communities. This finding supported the study of [17]. Education wise, only 4.2% do not have formal education denoting that more than three-quarter has varying levels of educational attainment especially, primary, secondary and tertiary level denoting most of the respondents are literate with high possibility of comprehending the research questions. In the same vein, the main occupational engagement for sustenance of household are personal businesses or household petty trades which perhaps justifies the reason why female gender dominated the sampled respondents for this study. In addition, most residents have spent more than 4 years in the area, with ability to x-ray the implications of the activities of road side mechanics. This findings corporates the study of [2, 3].

With respect to the environmental implications of RAW, aside from contamination of underground water sources by heavy metals, the study revealed that noise, traffic delay, and vibration among the most prominent implications being infused various activities that take place in the workshop which has spillover effects in adjoining neighbourhood aside from the obstruction cause by encroachment to the streets and other access roads. This is similar to the findings of [11-13, 17]. Similarly, the prominent externalities resulting from the nature of waste based the activities of RAWs is in descending order consist of noise, offensive odour, oily surfaces, abandoned vehicles and rubber/plastic. Others are steam/ waste water, wire/pins, grease and diesel/petrol. This finding is novel. Invariably these externalities contribute to discomfort of residents, distort the city image and also, reduce the aesthetic quality of the affected environment which are at variance to only economic benefits reported by [3]. On the method of waste disposal by the operators of RAW, it is observed that the activities of scavenger and open dumping dominated the practice, while only few makes use of waste drum for piling their waste, while very few male use of government waste disposal facility which is at variance to previous findings. This result shows that little attention is being accorded to waste disposal and hygienic environment in the mechanic workshops; hence, the need to evolve strategy to improve general sanitation practices at roadside mechanic workshops in the city of Ota. Also, the operators of the RAWs and the community development association always addresses the residents' complaint based on the activities of RAWs in their residences. By this, it is evident that the possible regulators in-charge of monitoring and regulating the activities of RAWs failed to respond to the resident complaints on the unpleasant externalities associated with informal mechanic workshops in the study area. This finding is novel.

On the effect of RAWs on the socioeconomic development of Ota, Ogun State, findings revealed that RAW, have positive impact on the trading and commercial activities as well as increase industrial productivity as industries in Ota equally benefit from such in the emergency repair of malfunction vehicles in transit; enhance continuous mobility and access to transport service. These findings also corroborate the findings of [2, 3]. In contrast, the operations of RAW do compromise aesthetic quality of the area, led to crisis and confrontation with the host and adjoining community and neighborhood, compromise safety and security in the neighborhood, while also increase the rate of waste accumulation and housing demand in the adjoining community. This finding is supported by the findings of [4]. Meanwhile, the results of the statistical locational impact of RAW on the socio-economic development of the study area which revealed that there is a relationship between of the RAW and the socio-economic development of Ota as the socio-economic development factors is novel. By

implication, the results implies that every unit change or improvement in the location of RAW will positive influences in the socio-economic development of Ota City, Nigeria.

5. Conclusions

Automobile workshops are very important in the efficient operations and maintenance of vehicles. They can be broadly divided into three groups: filling stations that sell fuel and perform minor maintenance tasks like oil and lubricant changes, wheel balancing and alignment, etc.; modern/standard workshops, which are organized motor repair service workshops with advanced technical skills and equipment, higher servicing costs, and formal servicing procedures; and roadside/wayside workshops (i.e. which arise due to collapse of the standard workshop and operates on sole proprietorship basis in urban areas). Specifically, RAWs have been integral part of land use in urban centres and cities since the advent of automobile.

It is interesting that such workshops are found across major cities and urban centres. In fact, the spatial location of automobile service workshops has been a major concern for many residents of cities and their adjoining areas considering their accompanying adverse effects. It is on this basis that the location and proliferation of roadside mechanical workshops in many Nigerian cities deserve urgent attention; hence, the basis for this study in assessing the perceived socio-economic and environmental implications of roadside automobile workshops in Ota City, Nigeria. This study established that the location and activities of RAWs which offers multitask operations including vulcanizing, battery charging, electrical repairs or rewiring, automobile upholstery, motor cycle repairs, and maintenance of all types of light vehicles, among others significantly contributes to the socio-economic development of Ota city, but it also attracts several social, economic and environmental consequences due to its nature of operation which is informal. It is on this basis that this study therefore, concludes that there is indiscriminate location and activities of RAWs in the study area like any other typical Nigerian cities. As such, the informal activities of RAWs are contributory to many adverse effects such as increase in crime and security beaches as well as poor aesthetic quality of their domain aside from traffic related delays congestion, noise and vibration which are associated with their operations. Sadly, relevant statutory government agencies most especially, Town Planning Authority and National Environmental Standards Regulation and Safety Agency are found wanting in checkmating the perceived proliferation of the RAWs in many Nigerian cities.

In order to enhance location impacts and socio-economic implications of the roadside mechanics in the study area and other cities and urban centres in the country, the following recommendations are made include the need for relevant government agencies such as Town Planning Authorities and National Environmental Standards Regulation and Safety Agency to conduct detail appraisal of the location and environmental impacts studies of roadside mechanics in major cities and urban centres of the country. This shall avail government, the necessary and required information towards integrating them into society and critical components of the informal sector of the economy as well as minimizing the proliferations of RAWs in the study area.

There is need for organizing workshops on spatial and environmental planning implications of the RAWs for the operators in order to improve their knowledge and create awareness on environmental safety for the practitioners. This workshop shall underscore the need to ensure free flow of traffic and minimize noise and other environmental hazards

associated with mechanical workshops in the society. Also, regular and consistent policing of the environment by statutory government agencies becomes indispensable. By this, formulation of spatial and operational guidelines and acceptable standards of operations and locations for RAWs must evolve. This shall include regular and periodic site inspection, monitoring and compliance to stipulated standards and guidelines by statutory regulatory agencies.

Finally, RAWs as a critical component of the informal sector of the economy have to improve aesthetic quality of the area. In this wise, the workshops and the ways at which vehicles are parked on the streets and adjoining areas must be in conformity with stipulated guidelines and standards.

Acknowledgments. Special appreciation to executives and members of the Nigeria Automobile Technicians Association (NATA) in Ota city for prompt and the cooperation received during the data collection exercise. Also, the researchers appreciate the residents of Ota city for seamless data gathering experienced during the administration of questionnaires.

Conflicts of Interest. The author declares no conflict of interest. Furthermore, this study received no financial support and, hence, this lack of funding support doesn't influence the study design, data collection, analysis, or interpretation, manuscript writing, or the decision to publish the results.

References

1. Nwafor, C.E.; Oko, O.O. Science and technical education beyond the classroom: A case study of mechanic village, Abakaliki, Ebonyi State, Nigeria. *Middle-East Journal of Scientific Research* 2018, 26 (7), pp. 688-697.
2. Ekong, F.U. Michael G.U.S, Michael, US. Assessing the effects of mechanic activities on Uyo air environment, *Ethiopian Journal of Environmental Studies and Management* 2012, 5(1), pp. 74-85.
3. Edunyah, I. Technology and modern automobile industry- challenges and opportunities for roadside mechanics in Ghana. (Tarkwa Nsueam Municipality). *International Journal of Scientific Research and Innovative Technology* 2015, 2(6), pp. 58-63.
4. Akinbinu, B. Informal small enterprises clusters, a case study of auto-mechanic villages in Ibadan. *Nigeria Institute of Social and Economic Research (NISER) monograph series*, Ibadan; 2001, 5.
5. Muze, N.E.; Opara, A.I.; Ibe, F.C.; Njoku, O.C. Assessment of the geo-environmental effects of auto-mechanic workshops at Alaoji Aba and Elekahia Port Harcourt, Niger Delta, Nigeria. *Environmental Health Analysis and Toxicology* 2020, 35(2), pp. doi.org/10.5620/eaht.e2020005.
6. Ijaiya, G.T.; Umar, C.A. The Informal and Formal sector Inter – linkages and the incidence of poverty in Nigeria: A case study of Ilorin metropolis. *African Development* 2004; 29 (3), pp. 84–102.
7. Akinbinu, A.F. Liberalization Policies and Technological Capability in the Informal Sector. *Nigeria Institute of Social and Economic Research (NISER) monograph series*, Ibadan; 1998, 5.
8. Adeyinka, S.A.; Omisore, E.O.; Olawuni, P.O.; Abegunde, A.A. An evaluation of informal sector activities and land use management on south western Nigerian. In *Shaping the change XX111 FIG congress*, Munich, Germany, 2006.
9. Oyesiku, O.O. The built environment and economic recession: The case of Nigeria. In *Lead paper presented at the 2nd national conference, School of environmental studies*, The Oke-Ogun Polytechnic, Saki, Nigeria, 2017.
10. Ziblim, B.; Nkrumah, J.; Imoro, I. Assessing the Skills of Roadside Mechanics in Diagnosing and Fixing Problems of Modern Electronic Managed Vehicles in Ghana (Tamale Metropolis). *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)* 2018, 45(1), pp. 207-225.
11. Amukali, O.; Bariweni, P.A.; Imaitor-Uku, E.E. Spatial distribution of heavy metal contamination indexes in soils around auto-mechanic workshop clusters in Yenagoa metropolis, Bayelsa State, Nigeria. *Global Journal of Earth and Environmental Sciences* 2018, 3(4), pp. 23-33.
12. Anegbe, B.; Okuo, J.M., Okieimen, F.E.; Ugbune, U.; Emina, R.A. Levels of Heavy Metals in Soil Sample from Active Automobile Workshops in Benin City. *International Journal of Environmental Chemistry* 2019, 3(1), pp. 7-17, doi: 10.11648/j.ijec.20190301.12.

13. Oloruntoba, E.O.; Ogunbunmi, T.O. Impact of Informal Auto-Mobile Mechanic Workshops Activities on Groundwater Quality in Ibadan, Nigeria. *Journal of Water Resource and Protection* 2020, 12, pp. 590-606. <https://doi.org/10.4236/jwarp.2020.127036>.
14. *Ogun State regional plan 2005-2025*. Final report. Ogun State Government, Abeokuta, Nigeria, 2008; 15-20.
15. Anand, S.V. Global environmental issues. *Open Access Scientific Reports* 2013, 2(2), pp. 1-9. Available online: <https://www.omicsonline.org/scientific-reports/2157-7617-SR-632.pdf>
16. Ogunyemi, S.A.; Ajileye, O.O.; Muibi, K.H.; Alaga, A.T.; Eguaroje, O.E.; Samson, S.A.; Ogunjobi, G.A.; Adewoyin, J.E.; Popoola, O.S.; Oloko-Oba, M.O.; Omisore, O.O. Geo-Information and distribution pattern of petrol service Station in Sango-Ota metropolis in Ado-Odo/Ota local government area, Ogun State, Nigeria. *Asian Research Journal of Arts & Social Sciences* 2017, 2(1), pp. 1-11.
17. Fasina, S.O.; Salisu, U.O.; Akanmu A.A. Curtailing the disaster of moving monsters in Lagos, Nigeria. *Journal of Academic Research in Economics* 2020, 12(1), pp. 151-173.

Citation: Akanmu, A.A.; Fasina, S.O.; Salisu, U.O.; Adeyemo, L.; Olorunfemi, S.O. Socio-economic and environmental implications of roadside automobile workshops in Ota city, Nigeria. *Journal of Social Science* 2022, 5 (3), pp. 48-70. [https://doi.org/10.52326/jss.utm.2022.5\(3\).05](https://doi.org/10.52326/jss.utm.2022.5(3).05).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).06](https://doi.org/10.52326/jss.utm.2022.5(3).06)
UDC [321.7+330.35](478)



DEMOCRACY AND ECONOMIC GROWTH: THE CASE OF MOLDOVA

Cristina Pavliuc^{1*}, ORCID ID: 0000-0002-6511-4004,
Alexandru Buga², ORCID ID: 0000-0002-4342-0502

¹Presidency of the Republic of Moldova, Chișinău, Republic of Moldova

²Technical University of Moldova, Chișinău, Republic of Moldova

*Corresponding author: Cristina Pavliuc, cristinabuga.perso@gmail.com

Received: 08. 05. 2022

Accepted: 09. 07. 2022

Abstract. This article addresses the issue of the cause-and-effect relationship between democracy and economic growth in Moldova from 1990 to 2020. This problem is one of the key topics of modern economic political science, but the results concerning the influence of the political system on economy are still ambiguous. No research has been conducted to date on this issue for Moldova. The econometric analysis was conducted using tree composite indexes of democracy, published by Freedom house, Polity V and V-Dem Varieties of Democracy. The causal impact between democracy indexes and per capita GDP growth is tested using Granger causality analysis. The results show that the choice of the democracy indicator and the time interval influences the modeling outcome. All three democracy indices depict different democratic trends at the country level. Although there is a positive causal link between the Polity index and GDP per capita in a short period, other results show no evidence that democratic reforms did contribute to economic growth in Moldova and vice versa. We conclude that democratization in conditions of weak law and political instability contributed to the emergency of a so-called hybrid democracy in Moldova.

Keywords: *democracy, economic growth, Republic of Moldova, hybrid democracy, Granger causality analysis.*

Rezumat. În acest articol se examinează relația cauză-efect dintre democrație și creștere economică în Republica Moldova din 1990 până în 2020. Această problemă de cercetare este unul dintre subiectele cheie ale științei politice economice moderne. Însă rezultatele privind influența sistemului politic asupra economiei sunt încă ambigue. Până în prezent, nu a fost efectuat nici un studiu pe această temă pentru Moldova. Analiza econometrică a fost realizată utilizând trei indici compoziți ai democrației publicați de *Freedom House*, *Polity V* și *V-Dem Varieties of Democracy*. Efectul causal dintre indicii democrației și creșterea PIB-ului pe cap de locuitor este testat folosind tehnica cauzalității Granger. Studiul arată că alegerea indicatorului și a intervalului de timp influențează asupra rezultatului analizei. Toți cei trei indici ai democrației descriu tendințe politice diferite la nivel de țară. Deși există o legătură cauzală pozitivă între *Polity* și PIB-ul pe cap de locuitor pe o perioadă scurtă de timp, celelalte rezultate nu atestă că reformele democratice au contribuit la creșterea economică în Moldova.

și viceversa. Concluzionăm că democratizarea în condiții de lipsă a statului de drept și instabilitate politică au dus la instalarea unei democrații hibride în Moldova.

Cuvinte-cheie: *democrație, creștere economică, Republica Moldova, democrație hibridă, analiza cauzalității Granger.*

1. Introduction

In January 2020, a research team from Cambridge's new Centre for the Future of Democracy released a report on Global Satisfaction with Democracy in the world. According to the study, there is a dramatic decline in satisfaction with democracy in almost all regions of the world. From Europe to Africa, as well as in Asia, Australia, the Americas, and the Middle East the proportion of people who claim to be "dissatisfied" with democracy has grown from 47.9% to 57.5% since the mid-1990s. Among citizens of developed countries, this indicator is even higher. Over the past quarter century, dissatisfaction with democratic institutions in these countries has escalated from a third to half [1]. According to authors this phenomenon is due to high economic insecurity, corruption scandals unemployment and wealth inequality: "if confidence in democracy has been slipping, it is because democratic institutions have been seen failing to address some of the major crises of our era, from economic crashes to the threat of global warming. To restore democratic legitimacy, that must change" [1].

Based on another recent research from the Institute for Varieties of Democracy, in 2021 the level of democracy in the world has declined to where it was in 1989. Nowadays dictatorships are rising and control 70% of the world's population or nearly 5.4 billion people [2].

Autocratization in a number of countries raise doubt about the effectiveness of liberal political ideology. Thus, the relationship between economic development and the democracy is not only theoretical but also of great practical importance.

Despite a large body of theoretical and empirical literature examining the issue, no scientific consensus has been reached. In addition, it has not been achieved in studies concerning transition countries [2–7]. Researchers who use different approaches and methods in assessing this phenomenon sometimes come to opposite conclusions.

The purpose of this article is to investigate the cause-and-effect relationship between democracy and economic growth in the Republic of Moldova from 1990 to 2020. Moldovan case study is of interest due to its vulnerability to economic effects of armed conflict in Ukraine, the characteristics of its ruling elite and its current harsh social conditions. Any political upheaval in Moldova may have major geopolitical implications and further destabilize the region. Therefore, a better understanding of political conditions necessary for the country's economic development can provide insight on its future.

This research is organized in the following manner. Section 2 provides a synthesis of the literature related to the relationship between democracy and economic growth, both in general and in relation to the former Socialist countries. Section 3 introduces the data sources used in this paper. Section 4 presents the Granger causality model and tests results. Section 5 contain the discussion of key findings. The final section summarizes the overall conclusion of the study.

2. Literature Review

The large and growing body of scholarly literature that examines the link between economic development and democracy can be categorized into two approaches. In the first one the conditions that give rise and sustain democracy are analyzed [4, 8–11]. The second

is aimed at determining how democracy contribute to welfare [12–17]. Based on research objectives, the following literature review provide a critical appraisal of the second stream, on how political freedom influences the speed of economic growth. It should be noted that both theoretically and empirically, the contemporary discussions in this area can be similarly divided into two groups. Some researchers conclude that democracy promotes economic growth, others that it does not.

2.1. "Democracy promotes economic growth" position

The first analytical approach has a strong ideological basis of liberal democracy and market economy. According to proponents of this approach, freedom of initiative and entrepreneurship can only flourish based on values favorable to individualism. Individualism, in turn, implies the ability to express one's opinion freely through universal suffrage. Thus, liberal democracy promotes the emergence of political institutions that sustain the rule of law, guarantee the enforcement of contracts and the protection of property rights [18–21]. Moreover, this conducive environment in the long term encourage increased investments, efficient resource allocation, fairness of distribution and profit maximization.

According to another series of studies, pluralistic democracy allows citizens to regularly and honestly change and exercise control over political leaders through accountability [22]. Thanks to the built-in culture of dialogue and negotiations, a democratic society better manages conflicts and promotes their resolution through cooperation. In the long run it prevent them from developing into open political crises that generate economic instability [23,24]. Also, democratic governments adopt a less aggressive, more peaceful foreign policy than countries ruled by dictators [23].

Under authoritarian regimes, the indicator of the effectiveness of public administration depends on the personality of a particular dictator and his tenure in office, which in the long run negatively affects the economic growth rate [25,26]. Firstly, the dictator is much more likely to experience a constant lack of information which leads to inevitable mistakes in decision-making. In the absence of a free and independent press, civil society and opposition, there are no means of find out whether citizens are dissatisfied with public policies. In an effort to maintain their position and wealth, the dictator's associates deliberately disseminate misleading or incomplete information to convince the dictator of the effectiveness of his rule, which, of course, is ineffective in improving the quality of public administration [27].

Various writings highlight the contribution of democracy to equitable economic and social development. By improving the population's social conditions and increasing secondary education funding, democratic regimes foster human development and stimulate innovation in production and management. For example, D. Rodrik's (1999) study shows that the democratization process increases the average wage and the share of wages in GDP, while a return to authoritarianism has the opposite effect [16]. According to D. Acemoglu and his co-authors (2015), democratic regimes provide more social benefits than autocratic ones. In particular, this concerns education and healthcare [28,29]. A. Sen, on the other hand, believes that the most important advantage of democratic regimes is their ability to avoid disasters and save lives and protect people in humanitarian crises. The presence of the opposition, an active civil society, elections and a free are built-in natural regulators of the system that can counteract a tyrannical government [17,30] . In democratic regimes, the risk of famine is thereby reduced.

The third argument relates to the "constructive role" of democracy for development.

By facilitating the dissemination of information and the organization of public debate, democracy ensures the acquisition and spread of knowledge which is important, for instance, in terms of public health (benefits of breastfeeding, HIV prevention). When comparing countries with an equal level of development, it can be noted that in democratic regimes, people live longer, infant mortality is lower, and women give birth to fewer children. Przeworski and al. (2000) conclude that, despite the fastest growth rates often observed under dictatorial regimes, democracies demonstrate greater stability in growth rates. In other words, no democracy has ever worked as badly as the worst of dictatorships. If democracy does not guarantee the best, it protects against the worst [32].

A prominent example of visible effects of authoritarian dissemination is the recent sharp reduction in freedoms and quality of life, especially of women in Afghanistan. Following US troop withdrawal from Afghanistan in August 2021, the Taliban regime expanded rapidly across the country. After this ultraconservative and religious faction seized power, 40% of the Afghan media closed down, and 60% of journalists were dismissed [2]. Repression against civil society intensified. Any criticism of the Taliban movement or any expression of alternative socio-political and religious views is categorically prohibited. However, women have suffered the most in the current situation. In six months, the Taliban regime has abolished almost all the rights that Afghan women fought for so hard over the past 20 years.

Several research papers find positive effects of democratic regimes on population's welfare, reduction of poverty and reduction of inequality. An empirical study performed by D. Acemoglu and his co-authors (2019) proves that over the past 25 years, democratization has increased GDP per capita by 20% [13]. According to K. Knutsen (2020), democratic regimes provide stable and predictable growth, as evidenced by the fact that only 7% of democracies experienced negative growth between 1900 and 2009 compared to almost 30% of autocracies [33]. These democratic gains are primarily driven by vertical accountability mechanisms created by fair elections and freedom of expression [32]. Papaioannou and Van Zanden (2015) argue that each year of authoritarian rule reduces economic growth by 0.088% in the short term and by 1.77% after 20 years of dictatorship. Gründler and Krieger (2016) used machine learning algorithms for an extensive data set for 185 countries from 1981 to 2011 and found democratization's significant and positive impact on income growth [34].

Research in a historical-comparative vein also indicates some positive correlation between democracy and development. Namely, the coincidence of the phases of development with the establishment of a pluralistic democracy in Western and Northern Europe, North America, Australia, and New Zealand makes it impossible not to recognize a real convergence between their respective logics of functioning [35]. Besides, nowadays most of the wealthiest countries in the world are democratic.

2.2. The position "democracy does not promote economic growth"

Supporters of this position appeal to historical examples, real politics and effectiveness of public administration. They assume being independent from value orientations and try to move away from prejudices of the liberal democratic discourse.

Early in the 70s, the American sociologist and political scientist S. Huntington analyzes the positive experience of socialist states' development and comes to the conclusion that not democracy but order and stability are the primary goals for development [36]. The sustained and rapid economic growth of China, Japan, South Korea, Vietnam, Singapore, and a number of other states of East and Southeast Asia provide additional importance to Huntington's

argument. In the context of a rigid state regulation and a bureaucratic authoritarian regime these countries made decisive breakthrough in development and moved into the ranks of newly industrialized countries. As Huang and Ho (2017) point out, the authoritarian regimes success in this region is primarily the result of the efficiency of their political governance, rather than their political system. Further empirical evidence for Middle East and North Africa's countries suggest that democratization negatively impacts economic growth [38]. State's capacity to guarantee the rule of law, private property and economic freedom show to be the most critical factors for long-term development [4,39–43].

According to A. Hirschmann (1986), in the long run, authoritarian regimes may demonstrate greater efficiency compared to democracy [44]. Next election limits the planning horizon of a democratic leader. Trying to secure the maximum chance of re-election, he tends to base his economic and social policies on predictable short-term commitments, while authoritarian leaders are not exposed to the uncertainty of electoral outcomes. In other words, a democratic decision-making system, unlike an authoritarian one, is more subject to pressure from certain interest groups interested not in maximizing social welfare but in increasing their rent. M. Olson (1993) points out that autocrats have encompassing interest in the territories they rule. This leads them to provide a peaceful order and other public goods that maximize his profits in the long run and create conditions for the prosperity of his subjects, thereby favoring the country's economic development [24].

J. Bhgwati (2002) notes that democratic institutions easily succumb to populist demands and are forced to redistribute the state budget among low-income groups. Whereas authoritarian regimes are better at suppressing social, ethnic, and class conflicts, opposing private interests, and taking coercive measures to sustain growth [15]. According to A. Przeworsky and his co-authors (2000; 2019) democratic governments have stronger preferences for current public consumption at the detriment of long-term investments [12,23]. Accelerating economic growth calls for an increase in investment, which in consequence may need a reduction in public social spending. Although beneficial in the long run, such a policy cannot be implemented in a democratic environment since it will not receive the necessary social support [45]. This leads to the impression that only under a dictatorship, governments can pursue successful growth acceleration episodes [46].

Some other research studies indicate that democracy does not improve social welfare since such political regimes do not reinforce discipline and social order. E. L. Glaeser and his co-authors (2004) conclude that low-income countries get out of poverty thanks to human capital development and good policies, often pursued by dictators [46].

According to Persson and Tabellini (2006), democratization and economic liberalization separately lead to an acceleration of growth [47]. However, countries that liberalize their economy before democratic transition, perform better than those carrying out the opposite sequence. This phenomenon is explained by the fact that young and fragile democracies in closed economic conditions are more likely to deepen into redistributive conflicts and populist politics. In contrast, emerging democracies with open economies are forced to pay more attention to economic efficiency.

A. Alesina and his colleagues (1996) examined the development patterns of 113 countries from 1950 to 1982 and found that democracy is a secondary variable that does not significantly affect the economic growth. Growth rates remained significantly lower in democratic government systems during periods with frequent government changes than in countries with authoritarian regimes but with stable governments [48]. In addition, when

taking into account other economic and regional factors affecting the growth rate and political stability, it can be noted that democratic countries are not more successful in terms of growth indicators than non-democratic ones [45,48].

According to an empirical study performed by Barro (1996), the relationship between economic growth and democracy is best explained by a curvilinear function (in the form of an inverted U-shaped curve). In other words, democratization promotes growth when political freedom is low but slows growth when there is already a high level of freedom in society. The author suggests that this non-linear relationship can be partly explained by the mechanisms of distribution and redistribution of economic resources. For example, under the worst dictatorships, political empowerment can boost economic growth through equal access to productive resources. However, states that have already reached moderate levels of democracy, further political empowerment could slow economic growth due to a rise in income inequality.

2.3. Le link between democracy and economic growth in transition countries

The fall of the Soviet Union marked the beginning of a process of profound socio-economic transformations for a number of countries. In a rapidly changing environment, democratization has been identified as the primary task for the formation and gradual development of a number of States. This trend described as a third wave of democratization (Huntington 1993) propelled human rights and civil liberties concerns into the global conscience and were seen as an extraordinary and remarkable achievement (see *The End of History* by F. Fukuyama, 1989).

Despite the initial rumored interest in this large scale political transformation, the literature on the impact of democracy on transitional economies is rather scarce. According to several authors, different development rates in post-socialist countries are closely related to each country's structural and historical heritage [4,7]. Pre-existing socio-economic institutions influenced the model of interaction between State and market and predicted how successful economic liberalization was going to be. Privatization led to long periods of rent-seeking and corruption in systems that previously lacked a social structure that encouraged entrepreneurship, private property rights, or a diversified industrial structure of the economy. Studying the correlation between political institutions and economic development in Russia, V. Mau and his co-authors found a significant and positive relationship between basic individual rights, freedoms and economic growth rates [39]. V. Polterovich and V. Popov (2005) prove that democratization in countries with poor rule of law undermines growth and entails high economic and social costs. In this type of countries, democratization *"leads to the emergence of so-called illiberal democracies [known as] a governing system in which shadow economy is expanding, institutional capacity of the state is weakening, and quality of macroeconomic policy is deteriorating"*. The transition from autocratic government toward democracy in the absence of rule of law result in an overall decline in economic growth.

S.N. Cheung also warns against introducing democracy before establishing a transparent system of private property, arguing that this can lead to over-regulation, misallocation of resources and rent-seeking [49]. According to the author, in the transition from a hierarchical communist system of distribution to a democratic system of private property, there is a risk that the system will be mired in corruption, especially if voting is introduced prematurely.

According to Kopstein and Reilly (2000), the structural heritage is no less critical than the historical one. Some countries advantageous geographical proximity to the former

Western border of the communist world gave them a comparative advantage in the development and advancement of democratic norms and institutions. This socio-economic proximity made it possible to overcome the negative consequences of counterproductive state policy. Fidrmuc (2003; 2021; 2000) demonstrates that the link between democracy and economic growth is not so unambiguous and depends (in addition to structural and historical parameters) of the selected time interval. In the author's point of view, the relationship between democratization and growth can be depicted as a U-shaped curve (which contradicts the Barro's (1996) conclusions who notes that the relationship follows an inverted U-shaped curve).

According to Fidrmuc the post-communist transition process superposed with two other phenomena. Firstly, the reform of authoritarian regimes was implemented simultaneously with large-scale economic liberalization measures. The former communist countries abandoned centralized planning and policymaking and introduced market economy (in some cases gradually and cautiously, in other cases quickly and on a large scale). Secondly, instead of rapid transformation and modernization, most transition economies plunged into deep and protracted recessions [6]. By 2000, only four transition economies had exceeded the 1989 production level. Nevertheless, over a long period, democracy impacted positively on growth – it promoted economic liberalization which consequently lead to higher growth rates [2]. Piątek, Szarzec, and Pilc (2013) studied the consequences of democracy on economic development in 25 post-socialist countries using 20 economic and political freedom indicators and Granger's causal relationship criteria. The authors conclude that although economic freedom positively affects economic performance in transition economies, political freedom is neutral for economic growth. Apolte (2011), using data on democracy, liberalization, and income for a sample of 25 transition economies for the period 1991-2011 found that only a moderate level of democratization has a significant positive effect on economic growth, while the acceleration of democratization leads to a decrease in growth rates. The author explains this ambiguous result by the institutional features of different countries in which formal democratic structures are embedded or on which they are superimposed.

Concluding this part, it is essential to note that despite many theoretical and empirical studies aimed at exploring the link between democracy and economic growth, scientific consensus has not been reached. It has also not been achieved on the issue of the possible impact of political systems on the speed and consistency of market reforms and development in post-socialist countries. Scholars using different approaches and methods come to opposite conclusions.

3. Data: Gastil, Polity V and V-Dem democracy indices

Moldova's political and economic transformation towards democracy and a market economy started after its independence in 1992. According to Gastil's indices there has been a positive trend in the scope of political and civil freedom until 2000. Political rights (i.e., organization of free and fair elections, freedom of assembly, demonstrations, freedom to form and operate associations) increased during this period, thereby raising the country's rating from "partially free" to "free."

In the sphere of civil liberties (i.e. freedom of speech and religion, working conditions, and individual rights), a positive evolution was also noted during the first ten years of independence, but less abrupt and more gradual (Figure 1).

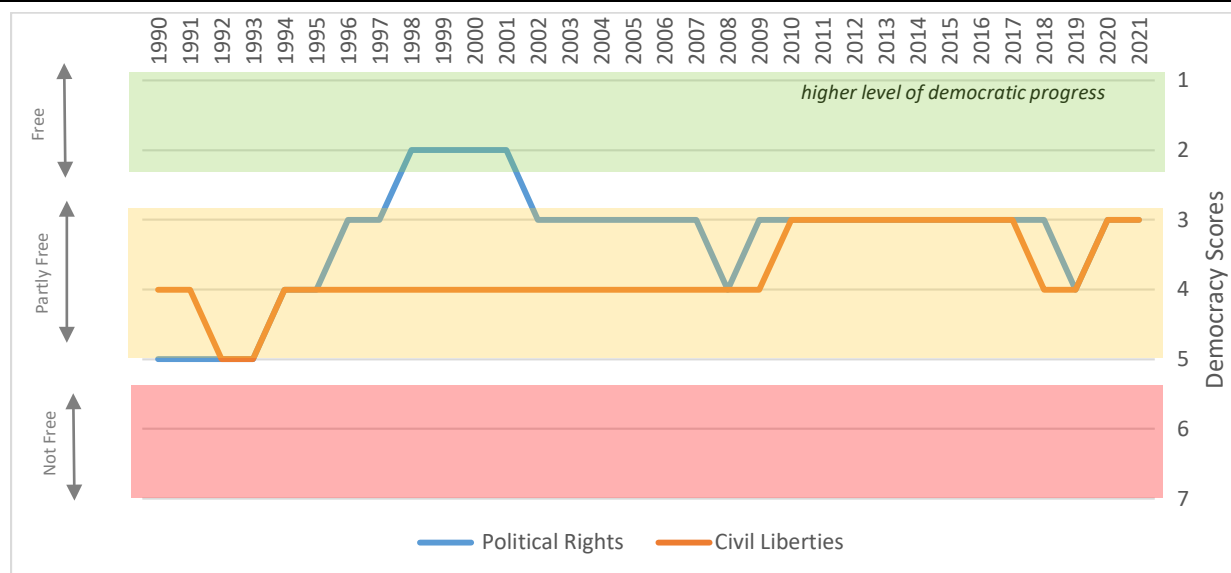


Figure 1. Political and civil freedom scores in Moldova according to Freedom House, 1990-2021.

Note: The “political rights” and “civil liberties” scores in 1990 correspond USSR democracy index scores.

Since 2000, the level of political rights in Moldova has decreased and fluctuated between 4 and 3.

As noted in the reports of the OSCE’s Office for Democratic Institutions and Human Rights (ODIHR) the electoral processes that are taking place in Moldova are “partially free, but incorrect” since “they do not meet some criteria that are central to a truly competitive electoral process,” such as: unbalanced coverage by the media [52], abuse of administrative resources in elections [53]; insufficiently clear rules for financing of campaigns [54].

According to the general rating of Freedom House, due to incomplete and unsatisfactory democratic transition, Moldova’s political regime is a mixed or “hybrid” democracy characterized by a weak pluralism syndrome.

This means that the country has the external attributes of a democracy (relatively free and fair elections, multiparty system, legal opposition). However, at the same time, there are also some manifestations of authoritarianism (low civic and political participation, widespread distrust in political institutions and low degree of citizen-centered political representation).

The Polity index reveals a positive long-term trend of Moldova’s political transition from authoritarianism to democracy (Figure 2). During the analyzed period 1989-2018, the democratic index of Moldova increased from the initial value of -4, which corresponds to the almost absence of political freedom, to the 9th level of the value of democracy (i.e., almost the maximum indicator). It should be recalled that this index shows the general level of openness of political institutions and is mainly reduced to the study of 3 characteristics of the political regime:

- 1) free recruitment of representatives of the executive power;
- 2) restriction on executive power;
- 3) the presence of political competition.

The Polity index uses variables reflecting the features of formal institutions in order to ensure consistency, verifiability, and unambiguity of comparison between different countries.

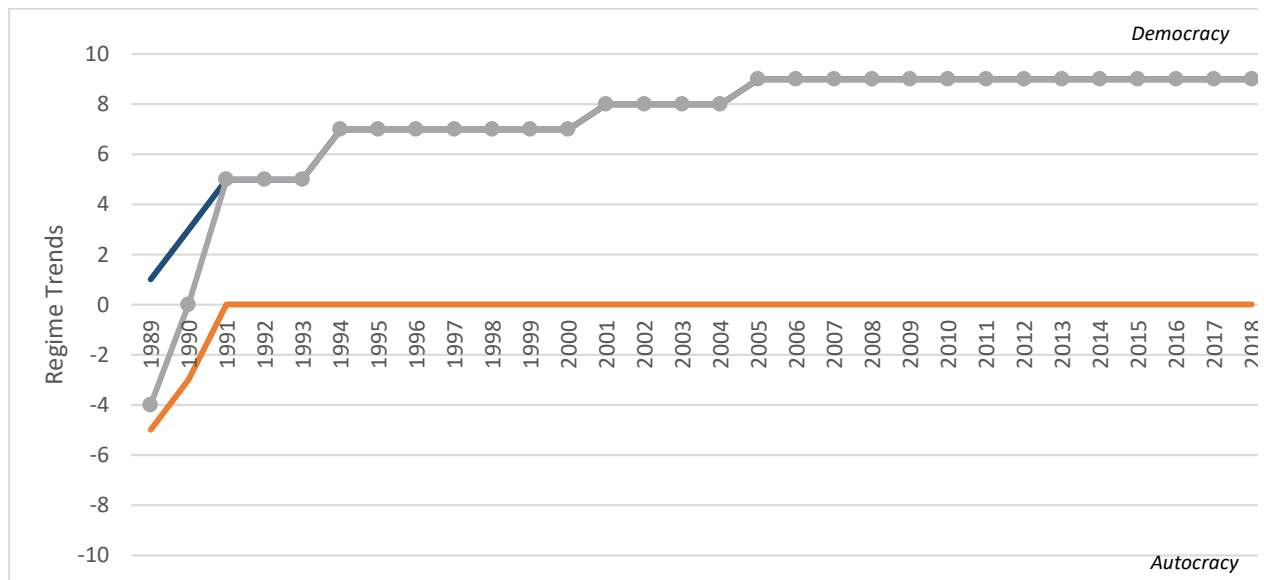


Figure 2. Polity V scores for Moldova, 1989-2018 [55].

According to the research project "Varieties of Democracy" (abbreviated V-Dem), the evolution of democracy in Moldova from 1990 up to 2021 fits the form of an increasing wave-like curve with alternating phases of ups and downs (Figure 3).

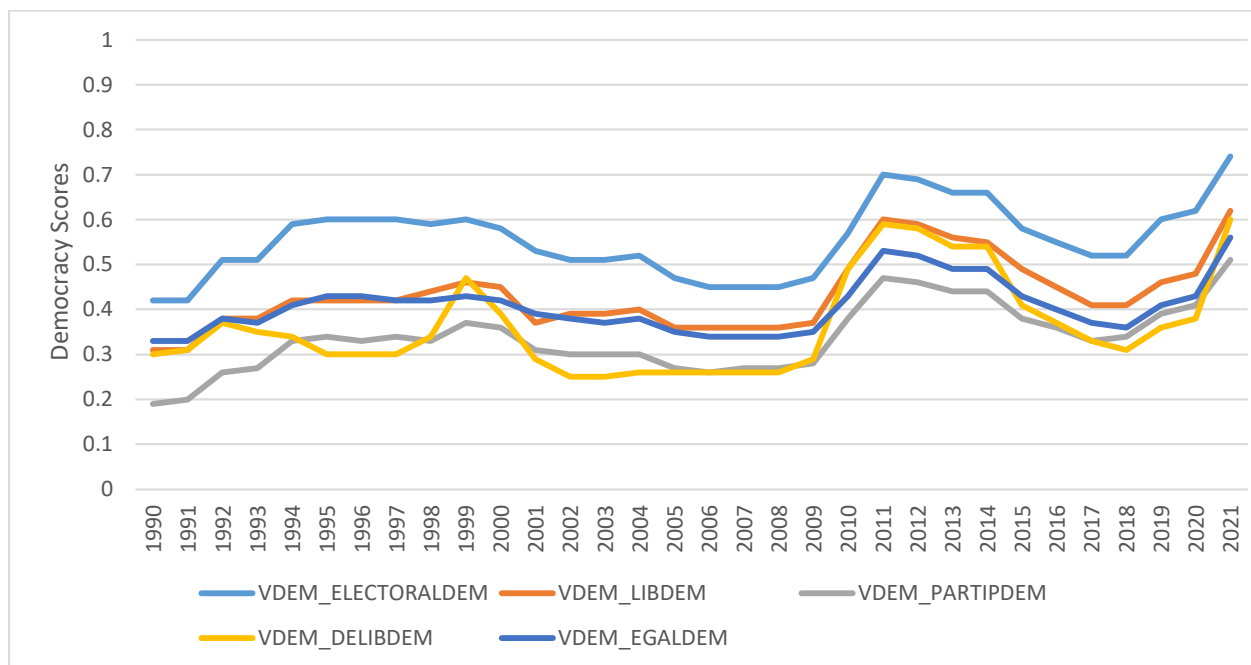


Figure 3. Democracy indices for Moldova according to V-Dem Varieties of Democracy, 1990-2021.

It should be noted the relationship (positive correlation) between the indices of electoral, liberal, participatory, advisory and egalitarian democracy.

Next, using an econometric model, we will study the relationship between the three democracy indices and the level of GDP per capita in Moldova (Figure 4).

Over 30 years of democratic transformations, the results of social and economic achievements in Moldova are unsatisfactory. The country still lacks most of the qualities that are critical for democratic development. First, the country is extremely poor. According to the World Bank's most recent estimate, by the end of 2020, Moldova's GDP per capita based on

purchasing power parity (PPP) is the lowest in Europe – \$ 4,547. For comparison, it is 87% of the same indicator in Albania, 40% in Romania, 45% in Russia, and 7% of that found in the United States.

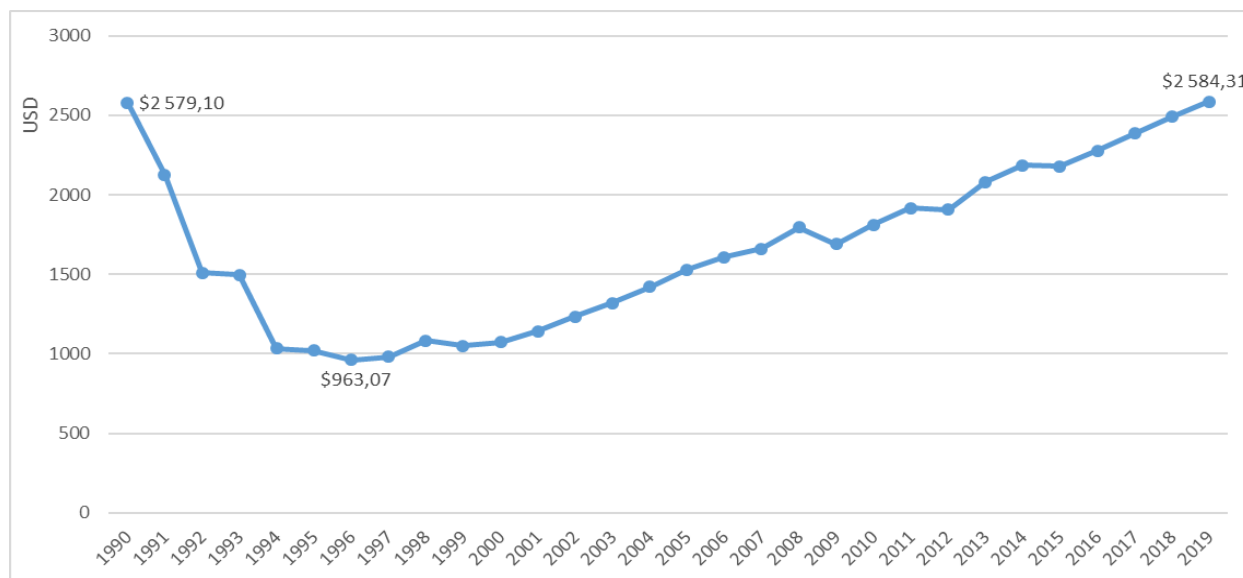


Figure 4. GDP per capita in Moldova, 1990-2019, in US dollars at constant prices in 2015 [56,57].

4. The Model

Most of the scientific works related to the impact of political regimes on a country's economic development are based on the tradition of comparative research established by Lipset (1959). Indices and ratings characterizing the political regimes of states are used as indicators of political institutions. GDP per capita [10, 13, 14, 58] or the Human Development Index [59, 60] measure economic development.

Since the early 1990s, regression analysis has been used in most empirical studies to determine the relationship and interdependence of changes in political institutions and the dynamics of economic growth. Nevertheless, various methodological approaches have been proposed in recent years. For example, cross-country regression analysis [10, 14], interval or dichotomous variables based on expert assessments [13], procedural algorithms and machine learning [34], new democracy indices [61] and meta-analysis [62, 63].

With the development of research practices and techniques, theoretical approaches to the problem have also changed. Modern theory distances itself from traditional philosophical disputes about the possible conflict in the relationship between democratic regimes and economic development and focuses on the study of the nature of their relationship. For example, scientists have separated the concept of economic democracy or economic freedom from political democracy. From this perspective, the question is not about whether democracy contributes to economic growth but to what extent political regimes increase economic freedom.

A number of other researchers prefer to study the importance of public administration's quality for ensuring society's development and well-being. According to Kaufmann, Kraay, and Mastruzzi (2011), both approaches of a "strong" or "minimalist" state have proved inconsistent in practice. It is not the political regime but the quality of public administration that is a prerequisite to development. Previously, different dimensions of the rule of law, voting rights, government accountability and effectiveness, political instability,

corruption or regulatory quality were partially or wholly attributed to political democracy. Today, scientists agree that democracy may not be a necessary prerequisite to build an effective State. Different development patterns are registered in different regions of the world. Based on this model, scholars are trying to determine the relationship between political regime and effectiveness of public management, which in turn allows to determine the relationship between political regime and growth [39, 40].

Other scientists chose an alternative approach and prove that a democratic regime substantially impacts economic growth through the accumulation of human capital, income distribution, economic freedom, and political stability [8, 9, 48]. Thus, in the question of the relationship between political democracy and growth, researchers are trying to identify other indirect or additional effects of democracies on growth rather than an unambiguous causal link between the form of government and economic development.

The progress in methodology for analyzing the empirical relationship "political regime – economic development" is accompanied by an increase in the number of institutional indicators. The differences in data collection methods and procedures among indicators influence analysis and results. At the same time, there is no consensus among scientists about which indicator is more accurate and complete in reflecting institutional quality.

The classical mathematical method of least squares is mainly used to determine the degree of correlation between political and economic variables. This approach allows to identify the straightforward nature of the relationship between two or more parameters but is ineffective in describing the causal relationship between the phenomena. In other words, studies based on the least squares method do not allow us to unequivocally assert that the development of democratic institutions has a stimulating effect on economic growth and not vice versa.

The methodological approach we have chosen to assess the relationship between democracy and economic growth in Moldova is based on a Granger causal analysis. This method involves examining whether the information provided by the lagged values of one variable increase forecast accuracy of another variable's present value. In other words, it can be said that the process X_t is Granger causing Y_t if variable X_t could be used to predict future movements in variable Y_t [64]. It should be noted that Granger's technique does not mean causation *per se*. Unlike cause and effect analysis, Granger test indicates that there is a "temporal relation" or "predictive causality" between the past values of one variable and the present value of another.

This mathematical method is used in the works of Corujo and Simões (2012) to study the eventual link between democracy and economic growth in Portugal in the period 1960-2001; Fidrmuc (2003) and Piątek, Szarzec, and Pilc (2013) to measure the impact of democratization on growth rates in post-communist countries; Heo and Tan (2001) to identify the relationship between democracy and development for a sample of thirty-two developing countries from 1950 up till 1982.

Based on this model the following two hypotheses are stated. The first one: democracy is not a cause in the Granger sense of GDP growth in Moldova during 1992-2020. The verification of this hypothesis require following two equations:

$$\Delta y_t = a_0 + \sum_{i=1}^{\infty} \alpha_i \Delta y_{t-i} + e_{1t} \quad (1)$$

$$\Delta y_t = a_0 + \sum_{i=1}^{\infty} \alpha_i \Delta y_{t-i} + \sum_{j=1}^{\infty} \beta_j x_{t-j} + e_{1t} \quad (2)$$

Where Δy stands for the GDP per capita growth in Moldova, t denotes time, x denotes the level of political freedom, a_0 represents a deterministic part (time trend or absolute coefficient), while e_{1t} is the error term. Equation (1) is employed to test to which extent the economic growth volatility can be explained by the lagged or passed values of economic growth, while equation (2) is used to verify whether any new information about growth volatility can be extracted from the past values of democracy scores respectively. If the past values of a particular democracy index do not provide any new information to the model, then this variable cannot be considered to Granger cause economic growth. On the other hand, if the past values of a particular democracy index bring new background information about economic growth volatility, then this specific variable can be considered a cause in Granger sense of economic growth. Thus, the null hypotheses tested can be written as follows: $\beta_1=\beta_2=\dots=\beta_j=0$, which means that democracy variables cannot be considered to Granger cause growth. The second hypothesis of our research work is to verify whether the economic growth does not Granger cause democracy in Moldova during the transition period. Similar procedure is implemented to verify this hypothesis.

$$\Delta x_t = a'_0 + \sum_{i=1}^{\infty} \alpha'_i \Delta x_{t-i} + e_{1t} \quad (3)$$

$$\Delta x_t = a'_0 + \sum_{i=1}^{\infty} \alpha'_i \Delta x_{t-i} + \sum_{j=1}^{\infty} \beta'_j y_{t-j} + e_{1t} \quad (4)$$

These are analogous to equations (1) and (2). Respectively, in this case the null hypothesis is: $\beta'_1=\beta'_2=\dots=\beta'_j=0$ which implies that economic growth cannot be regarded as a Granger cause of democracy.

Before assessing the causal relationship, we have to determine a number of previous measurements (lag order) taken into account to predict future values. Since theoretical guidance is not available and a priori information about the proper lag length is lacking, estimations were reported for three different time lags. This procedure allows us to verify short-term and intermediate-term effects.

For all calculations an augmented Dickey–Fuller test (ADF) unit root test for stationarity was conducted. All variables but “Polity” were transformed into their first difference to become stationary. Polity index proved to be stationary in levels.

Granger causality was performed with the Wald test at the 5% level of significance (p-value). EViews 12 version was used for estimation. The statistical procedure built-in EViews allows us to check the relationship in both directions (i.e., the program checks two hypotheses simultaneously: X cause Y and Y cause X).

Final results of Granger's causal relationship estimations for democracy indices and GDP growth per capita are presented in the table below. If the calculated F-stat value is higher than the critical values of F at the $p=0,05$ level of significance, there is a reason to reject the null hypothesis and to conclude that one variable does Granger cause another.

Table 1

Results of Wald tests for null hypothesis: GDP growth is not a cause of changes in democracy index scores vs. democracy scores is not a cause of GDP growth in Granger sense

	Lag 1			Lag 2			Lag 3		
	Obs.	F-Stat	p-value	Obs.	F-Stat	p-value	Obs.	F-Stat	p-value
Polity index									
Growth → Polity	27	8.2	0.87%	26	3.2	6.25%	22	1.75	19%
Polity → Growth	27	13.5	0.12 %	26	1.7	20%	22	0.2	87%

Continuation Table 1

Freedom House index									
Growth→ Political Rights	28	0.21	64%	27	3.07	6.7%	26	2.62	40%
Growth→ Civil Liberties	28	0.39	54%	27	1.24	31%	26	1.91	16%
Political Rights→ Growth	28	0.98	33%	27	0.56	57%	26	1.04	7.9%
Civil Liberties→ Growth	28	0.03	86%	27	1.45	25%	26	1.61	19%
V-DEM index									
Growth→ Electoral Dem	28	0.15	70%	27	1.43	25%	26	1.15	35%
Growth→ Lib Dem	28	0.21	65%	27	0.38	68%	26	0.42	74%
Growth→ Partip Dem	28	0.29	59%	27	0.61	54%	26	0.51	20%
Growth→ Delib Dem	28	0.01	91%	27	0.19	82%	26	0.24	86%
Growth→ Egal Dem	28	0.14	70%	27	0.68	51%	26	1.07	38%
Electoral Dem→ Growth	28	0.13	71%	27	2.26	77%	26	1.04	40%
Lib Dem→ Growth	28	0.01	92%	27	0.39	68%	26	0.69	57%
Partip Dem→ Growth	28	0.00	97%	27	0.41	66%	26	1.15	35%
Delib Dem→ Growth	28	0.00	95%	27	0.48	62%	26	0.79	51%
Egal Dem→ Growth	28	0.02	89%	27	0.15	85%	26	0.88	46%

5. Results and Discussion

Based on our analysis of the democracy-growth relationship, we are unable to provide a definite statement about causal correlation between economic growth and the level of democracy. The results suggest that variations in economic growth per capita may be useful in forecasting Polity democracy index scores in the short period and vice versa. However, in a longer period, any causal relationship disappears (2 and 3 years). Our econometric model did not reveal any other cause-and-effect relationships between the Freedom House and V-Dem Verities indices and economic growth. Therefore, we can affirm that democratization is not the primary or dominant factor of economic growth in Moldova.

It should be noted that Polity data captures minimalist democratic key qualities related to political competition, executive selection and the existing constraints on executive authority. Despite a large number of institutional characteristics taken into account, Polity does not reflect other fundamentally essential parameters, such as equality of opportunity, political participation, human rights or other fundamental freedoms. For Moldova, Polity scores indicate slow but positive dynamics of changes in democracy. From 2005, the state's Polity score is almost at its maximum, 9 out of 10, indicating very high level of democratic institutional characteristics which, certainly, raises a lot of questions. Despite Moldova's competitive electoral political system, the country exhibit systemic deficiencies in guaranteeing the rule of law, political stability and corruption enforcement in the government sector. All these considerably hamper democratic governance, and by extension, hinder the potential of participatory democracy in Moldova.

The Freedom House's index also points to a slowly changing political reality in the country. If Polity scores paint a somewhat optimistic picture of democracy development in Moldova, then, according to Gastil's classification criteria, since 2000, Moldovan political system has been in a stable "gray zone", characterized by "government in transition or hybrid regime". Such countries combine democratic features with autocratic ones and can simultaneously hold regular elections and carry out various forms of political repression. Hybrid regimes comprise external attributes of democracy (elections, political pluralism, opposition) but low level of political representation and participation. Political progress in such countries may not occur for decades.

Besides, the population's poverty affects the formation and strengthening of democratic institutions and the legitimization of democracy. According to the World Values Survey results, Moldovans citizens survival values have priority over support for democracy, freedom of choice, or autonomy [67]. In other words, while the physical survival of the population remains uncertain, the orientation toward utilitarian interest is obvious. However, people's priorities for survival increase the risk of manipulation by unscrupulous politicians. Populists and demagogues more easily influence voters with incomes close to the subsistence level. Impoverished people are more likely to trade their sovereign electoral rights and are easily influenced by manipulative techniques. Concentration and opaque media ownership increase the risk of fake news, disinformation and other tactics to undermine democracy. The Freedom House's report on media in Moldova 2020 proves that many mass media in the country are captured and serve as mouthpieces for political interests [68].

The prospects of pluralism in Moldova are also threatened by the Transnistrian conflict, the lack of consensus on national identity, the demographic crisis, the inefficient, highly specialized sectoral structure of the economy, and others [69]. The country continues to be predominantly a rural with 61.82% of the population living in the countryside (2014 census, NBS). Agricultural sector is a central pillar of the national economy and the main source of income. It is engaging about a fourth of moldovan active population [70].

The above-mentioned socio-economic characteristics indicate that democracy in Moldova is less a result of its citizen's strong support of democratic values or liberal and individualistic views but rather a result of social inertia. As Lucan Way rightly noted in his study, democracy in Moldova lasted so long not because of insufficient attempts of Moldovan politicians to weaken it but despite such attempts [71]. During its 30 years of independence, the country was confronted to high political instability and unpredictability which, in itself, was bound to negatively influence its economic development. Undoubtedly, these dynamics also affected confidence in political parties and political elite in general. For example, according to Vox Populi opinion poll conducted in February 2021, only 12% of respondents trust the Parliament, and only 9% trust political parties. Thus, the parties of the Republic of Moldova occupy the last place in the rating of public confidence among public and private institutions.

6. Conclusions

In this study, we investigate the issue of causal direction between democracy and economic growth, based on Moldova's experience. Using a data set of three democracy indexes and economic growth rates over the 1991-2020 period, we apply Granger causality techniques. Our results show that democratic reforms did not precede economic growth in the Republic of Moldova. The causal relationship between the Polity democracy index and GDP per capita in a short period (1 year) is not a sufficient reason to assert the opposite. The constructed model indicates the importance of choosing quantitative indicators when assessing the empirical relationship "institutional factor – economic development". All three democracy indices depict different democratic trends at the country level. The results therefore are sensitive to the choice of variables and time interval.

Democratization in conditions of weak law and order, political instability, and blurred social identity led to the emergence of so-called hybrid democracy in Moldova. In such countries, early democratization is associated with lower institutional capacity and higher corruption and respectively with lower growth rates. For more accurate results, it is necessary

to develop other econometric approaches that allow not only to identify the relationship between the time series but also to measure the impact such factors as economic liberalization, the rule of law, and the level of corruption. We emphasize that this work does not question the intrinsic value of democracy in a pluralist society. However, we assume that democratization under particular conditions is associated with costs and can result in illiberal or hybrid regimes. Indirectly, this research emphasizes the importance of understanding the need for consistent and progressive democratic developments.

Conflicts of Interest. The authors declare no conflict of interest.

References

1. Centre for the Future of Democracy. Available online: <https://www.cam.ac.uk/stories/dissatisfactiondemocracy> (accessed on 29.01.2022).
2. Fidrmuc, J. Democracy as a Driver of Post-Communist Economic Development. In *The Palgrave Handbook of Comparative Economics*, 1st ed.; Douarin, E., Havrylyshyn, O., Eds.; Palgrave Macmillan: Basingstoke, United Kingdom, 2020; Volume 1, pp. 517–43.
3. Fidrmuc, J. *Liberalization, democracy and economic performance during transition*. ZEI Working Paper, No. B 05-2000, Rheinische Friedrich-Wilhelms-Universität, Bonn, Germany, 200, p. 38.
4. Chen, J.; Xin, G. Competitive Rent-Seeking, Socioeconomic Infrastructures, and Post-Communist Transition in Central and Eastern Europe. *Chinese Journal of International Review* 2019, 1(2), pp. 1-17.
5. Apolte, T. Democracy and prosperity in two decades of transition. *Economics of Transition and Institutional Change* 2011, 19, pp. 693–722.
6. Kornai, J. The Great Transformation of Central Eastern Europe: Success and Disappointment. *The Economics of Transition* 2006, 1, pp. 207–244.
7. Gould, J. A. Out of the Blue? Democracy and Privatization in Postcommunist Europe. *Comparative European Politics* 2003, 1, pp. 277–311.
8. Lipset, S. M. Some social requisites of democracy: Economic development and political legitimacy. *American political science review* 1959, 53, pp. 69–105.
9. Diamond, L. Seymour Martin Lipset 1959 Some Social Requisites of Democracy: Economic Development and Political Legitimacy. *American Political Science Review* 2006, 53, pp. 69–105.
10. Barro, R. J. Determinants of democracy. *Journal of Political Economy* 1999, 107, pp. 158–83.
11. Rød, E. G.; Knutsen, C. H.; Hegre, H. The determinants of democracy: a sensitivity analysis. *Public Choice Journal* 2020, 185, pp. 87–111.
12. Przeworski, A. *Crises of Democracy*. Cambridge University. Ed. New York University, United States, 2019, p. 240.
13. Acemoglu, D.; Naidu, S.; Restrepo, P.; Robinson, J. A. Democracy does cause growth. *The Journal of Political Economy* 2019, 127, pp. 47–100.
14. Barro, R. J. Democracy and growth. *Journal of Economic Growth* 1996, 1, pp. 1–27.
15. Bhagwati, J. Democracy and Development: Cruel Dilemma or Symbiotic Relationship? *Review of Development Economics* 2002, 6, pp. 151–62.
16. Rodrik, D. Democracies pay higher wages. *The quarterly journal of economics* 1999, 114, pp. 707–738.
17. Sen, A. Democracy and social justice. In *Conference on Democracy, Market Economics & Development, an Asian Perspective*, Seoul, South Korea, 1999; Published in World Bank Development Outlook, 1999, pp. 7–24.
18. Clague, C.; Gleason, S.; Knack, S. Determinants of Lasting Democracy in Poor Countries: Culture, Development, and Institutions. *The Annals of the American Academy of Political and Social Science* 2001, 573, pp. 16–41.
19. Acemoglu, D.; Robinson, J. The Role of Institutions in Growth and Development. *International Bank for Reconstruction and Development / The World Bank on Behalf of the Commission on Growth and Development* 2008, 10, p. 44.
20. Acemoglu, D.; Robinson, J. Non-Modernization: Power–Culture Trajectories and the Dynamics of Political Institutions. *Annual Review of Political Science* 2022, 25, pp. 323–339.
21. North, D.C.; John, J. W.; Barry, R. W. *Violence and Social Orders: A Conceptual Framework for Interpreting Recorded Human History*. First paperback ed.; Cambridge University Press: Cambridge, England, 2013, p. 328.
22. Kaufmann, D.; Kraay, A.; Mastruzzi, M. The worldwide governance indicators: Methodology and analytical issues. *Hague Journal on The Rule of Law* 2011, 3, pp. 220–246.

23. Przeworski, A.; Alvarez, M. E.; Cheibub, J. A.; Limongi, F. Democracy and development: Political institutions and well-being in the world, 1950-1990, 1st ed.; Cambridge University Press: New York, United States, 2000, p. 303.
24. Olson, M. Dictatorship, democracy, and development. *American Political Science Review* 1993, 87, pp. 567–576.
25. Papaioannou, K. J.; Van Zanden, J. L. The dictator effect: how long years in office affect economic development. *Journal of Institutional Economics* 2015, 11, pp. 111–139.
26. Wintrobe, R. How to understand, and deal with dictatorship: an economist's view. *Economics of Governance* 2001, 3, pp. 35–58.
27. Egorov, G.; Sonin, K. Dictators and their viziers: Endogenizing the loyalty–competence trade-off. *Journal of the European Economic Association* 2011, 9, pp. 903–930.
28. Acemoglu, D.; Naidu, S.; Restrepo, P.; Robinson, J. A. Democracy, redistribution, and inequality. In *Handbook of income distribution*. Ed. Elsevier: Amsterdam, Netherlands, 2015; Volume 2, pp. 1885–1966.
29. Ansell, B. W. Traders, teachers, and tyrants: democracy, globalization, and public investment in education. *International Organization* 2008, 62, pp. 289–322.
30. Sen, A. Democracy: The Only Way Out of Poverty. *New Perspectives Quarterly* 2000, 17, pp. 28–30.
31. De Waal, A. Mass Starvation: The History and Future of Famine. 1st ed.; John Wiley & Sons: New York, United States, 2017, p. 264.
32. V-Dem Institute. Available online: https://v-dem.net/media/publications/dr_2022.pdf (accessed on 26.05.2022)
33. Knutsen, C. H. A Business Case for Democracy: Regime Type Growth and Growth Volatility. *Democratization* 2021, 28, pp. 1505–1524.
34. Gründler, K.; Krieger, T. Democracy and growth: Evidence from a machine learning indicator. *European Journal of Political Economy* 2016, 45, pp. 85–107.
35. Marchesin, P. Démocratie et développement. *Revue Tiers Monde* 2004, 179, pp. 487–513.
36. Huntington, S. P. *Political Order in Changing Societies*, 1st ed.; Yale University Press: New Haven, United States, 1968, p. 499.
37. Huang, C.J.; Ho, Y.H. Governance and economic growth in Asia. *The North American Journal of Economics and Finance* 2017, 39, pp. 260–272.
38. Parma, P.B. Political institutions and economic growth: a relationship study. *Political Science Review* 2021, 2, pp. 13–41 [in Russian].
39. Mau, V.; Yanovskiy, K. Political and Legal Factors of Economic Growth in Russian Regions. *Post-Communist Economies* 2002, 14, pp. 321–339.
40. Polterovich, V.; Popov, V. *Democracy and growth reconsidered: Why economic performance of new democracies is not encouraging*. Ed. MPRA Paper from University Library of Munich: Munich, Germany, 2005, p. 35.
41. Mau, V. Lessons in stabilization and prospects for growth: Russia's economic policy in 2016. *Russian Journal of Economics* 2017, 3, pp. 109–128.
42. Mau, V.A. Social and Political Prerequisites and Consequences of Radical Economic Policies in Russia. *International Journal of Political Economy* 1994, 24, pp. 52–75.
43. Mau, V. Perestroika: Theoretical and political problems of economic reforms in the USSR. *Europe-Asia Studies* 1995, 47, pp. 387–411.
44. Hirschmann, A. *Vers une économie politique élargie*, 1st ed.; Minuit: Paris, France, 1986, p. 112.
45. Piątek, D.; Szarzec, K.; Pilc, M. Economic freedom, democracy and economic growth: a causal investigation in transition countries. *Post-Communist Economies* 2013, 25, pp. 267–288.
46. Glaeser, E. L.; La Porta, R.; Lopez-de-Silanes, F.; Shleifer, A. Do Institutions Cause Growth? *Journal of Economic Growth* 2004, 9, pp. 271–303.
47. Persson, T.; Tabellini, G. Democracy and Development: The Devil in the Details. *American Economic Review* 2006, 96, pp. 319–324.
48. Alesina, A.; Özler, S.; Roubini, N.; Swagel, P. Political instability and economic growth. *Journal of Economic Growth* 1996, 1, pp. 189–211.
49. Cheung, S. N. The curse of democracy as an instrument of reform in collapsed communist economies. *Contemporary Economic Policy* 1998, 16, pp. 247–269.
50. Kopstein, J. S.; Reilly, D. A. Geographic diffusion and the transformation of the postcommunist world. *World politics* 2000, 53, pp. 1–37.

51. Fidrmuc, J. Economic reform, democracy and growth during post-communist transition. *European journal of political economy* 2003, 19, pp. 583–604.
52. Senate of the United States of America. Available online: <https://www.govinfo.gov/content/pkg/BILLS-111sres56rs/pdf/BILLS-111sres56rs.pdf> (accessed on 27.06.2022)
53. OSCE. Available online : <http://www.e-democracy.md/files/elections/parliamentary2009/interim-report-2-osce-elections-2009-ro.pdf> (accessed 26.06.2022)
54. ODIHR. Available online: <https://www.osce.org/ru/odihr/elections/492625> (accessed on 17.05.2022)
55. Center for Systemic Peace. Available online : <https://www.systemicpeace.org/polityproject.html> (accessed on 03.03.2022)
56. United Nations Statistics Division. Available Online: <http://data.un.org> (accessed on 19.06.2022).
57. Biroul Național de Statistică. Available online: <https://statistica.gov.md/> (accessed on 19.06.2022).
58. Acemoglu, D.; Robinson, A. J. *Why Nations Fail: The Origins of Power, Prosperity and Poverty*, 1st ed.; Crown Business: New York, United States, 2012, p. 544.
59. Saha, S.; Zhang, Z. Democracy-growth nexus and its interaction effect on human development: A cross-national analysis. *Economic Modelling* 2017, 63, pp. 304–310.
60. Spaier, V.; Ranganathan, S.; Mann, R.P.; Sumpter, D.J. The dynamics of democracy, development and cultural values. *PloS one* 2014, 9 (6), e97856.
61. Acemoglu, D.; Aizenman, N.; Aksoy, C. G.; Fiszbein, M.; Molina, C. A. *(Successful) Democracies Breed Their Own Support*, 1st ed.; National Bureau of Economic Research: Cambridge, United States, 2021, p. 80.
62. Doucouliagos, H.; Ulubaşoğlu, M.A. Democracy and economic growth: a meta-analysis. *American Journal of Political Science* 2008, 52, pp. 61–83.
63. Colagrossi, M.; Rossignoli, D.; Maggioni, M.A. Does democracy cause growth? A meta-analysis (of 2000 regressions). *European Journal of Political Economy* 2020, 61, pp. 101824.
64. Granger, C. W. Investigating causal relations by econometric models and cross-spectral methods. *Econometrica. Journal of the Econometric Society* 1969, 1, pp. 424–438.
65. Corujo, S. A.; Simões, M. C. Democracy and growth: evidence for Portugal (1960–2001). *Transition Studies Review* 2012, 18, pp. 512–528.
66. Heo, U.; Tan, A. C. Democracy and economic growth: a causal analysis. *Comparative politics* 2001, 1, pp. 463–473.
67. WVS. Available online: <https://www.worldvaluessurvey.org/WVSContents.jsp> (accessed on 25.06.2022)
68. Freedom House. Available on: https://freedomhouse.org/sites/default/files/2021-10/FotP_Moldova-2021_En_0.pdf (accessed on 23.05.2022).
69. Pavliuc, C. A. Moldovan Identity: Two Projects, Two Ways of State Development. *Scientific journal "Discourse-P"* 2021, 18(3), pp. 142–159.
70. United Nations Development Assistance Framework for the Republic of Moldova. Available online: <https://moldova.un.org/sites/default/files/2019-10/UNDAF%20Moldova%20EN.pdf> (accessed on 02.06.2022).
71. Way, L. Pluralism by default in Moldova. *Journal of democracy* 2002, 13, pp. 127–141.

Citation: Pavliuc, C.; Buga, A. Democracy and economic growth: the case of Moldova. *Journal of Social Sciences* 2022, 5 (3), pp. 71–87. [https://doi.org/10.52326/jss.utm.2022.5\(3\).06](https://doi.org/10.52326/jss.utm.2022.5(3).06).

Publisher's Note: JES stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).07](https://doi.org/10.52326/jss.utm.2022.5(3).07)
UDC 330.322.14:625.7(669)



GOVERNMENT INVESTMENT ON ROAD INFRASTRUCTURE IN KOGI STATE, NIGERIA: THE IMPACT ON URBAN MOBILITY

Samuel Oluwaseyi Olorunfemi¹, ORCID: 0000-0002-3218-6562,
Ayobami Ademola Akanmu², ORCID: 0000-0002-9264-5863,
Umar Obafemi Salisu^{3*}, ORCID: 0000-0003-1630-3420

¹Federal University of Technology, Akure, +234, Nigeria

²Oke-Ogun Polytechnic, Saki, JCH4+R82, Adoyan Hill, Nigeria

³Olabisi Onabanjo University, Ago-Iwoye, +234, Nigeria

*Corresponding author: Umar Obafemi Salisu, obafemiumar@gmail.com

Received: 05. 18. 2022

Accepted 07. 22. 2022

Abstract. Road infrastructure has been identified as a major factor for sustaining urban mobility and requires constant investment in the form of budgetary allocation for construction, rehabilitation, and maintenance. To this end, the study assesses government investment in road infrastructure in Kogi State, Nigeria and how it impacts urban mobility. The study adopted a mixed-method research design and deployed a questionnaire survey to elicit information from randomly selected 1,215 household heads. Also, data on the state's budgetary allocation and road infrastructure expenditure from 2008–2018 were sourced. Findings shown that the year 2015 received the highest budgetary allocation for road infrastructure and there is a statistically significant trend difference in the development of road infrastructure in the area. The results revealed that the annual road infrastructure expenditure has a statistical influence on the state's general sectoral budget ($F_{9}^{1} 92.776$, $p=0.000<0.05$). Meanwhile, residents' perception analysis revealed that government investment on road infrastructure is fairly impactful in Adavi, Okene, Dekina, Ajaokuta, and Lokoja, somewhat impactful in Ankpa and Kabba-Bunu, and no impact was felt in Mopa-Amuro and Bassa-Oguma communities. The study recommends giving more priority and increasing budgetary allocations for road infrastructure towards improving urban mobility and logistics functions in the state.

Keywords: Budgetary allocation, government expenditure, road transport infrastructure, transport system, urban area, urban transport.

Rezumat. Infrastructura rutieră a fost identificată ca un factor major pentru susținerea mobilității urbane, care necesită investiții constante sub formă de alocări bugetare pentru construcție, reabilitare și întreținere. În acest scop, studiul evaluează investițiile guvernamentale în infrastructura rutieră din statul Kogi, Nigeria și impactul acestora asupra mobilității urbane. Studiul a adoptat un design de cercetare cu metode mixte și a desfășurat un chestionar pentru a obține informații de la 1215 capi de gospodărie selectați aleatoriu.

De asemenea, au fost obținute date privind alocarea bugetară a statului și cheltuielile cu infrastructura rutieră din 2008–2018. Constatările au arătat, că anul 2015 a fost cea mai mare alocare bugetară pentru infrastructura rutieră și există o diferență semnificativă statistic în dezvoltarea infrastructurii rutiere în zonă. Rezultatele au arătat că cheltuielile anuale cu infrastructura rutieră au o influență statistică asupra bugetului general sectorial al statului ($F_{1/9} 92,776$, $p=0,000<0,05$). Între timp, analiza percepției rezidenților a arătat că investițiile guvernamentale în infrastructura rutieră au un impact destul de mare în Adavi, Okene, Dekina, Ajaokuta și Lokoja, în Ankpa și Kabba-Bunu și nu s-a simțit niciun impact în comunitățile Mopa-Amuro și Bassa-Oguma. Studiul recomandă acordarea mai multor priorități și creșterea alocațiilor bugetare pentru infrastructura rutieră în vederea îmbunătățirii mobilității urbane și a funcțiilor logistice în stat.

Cuvinte cheie: *Alocare bugetară, cheltuieli guvernamentale, infrastructură de transport rutier, sistem de transport, zonă urbană, transport urban.*

1. Introduction

The road transport system is a major sub-sector of transportation globally. This is because its operation is very flexible and, owing to this fact, road transport accounts for more than 90% of all passenger transport and greater than 80% of all freight transport in most nations of the world in terms of tonnes and passengers carried [1, 2]. It is the greatest mode of conveying people, goods, and services from one point to the desired destination with the sole value of time and worth chain addition [1, 3]. The successful operation of road transport is hinged on the level of road infrastructure. Road infrastructure is among the basic and critical factors that form the face of development in every economy. Road transport, through its infrastructural amenities, provides access and mobility means to employment, health, education, and other social services, which are vivacious to any meaningful development program [4]. Road transport infrastructure includes fixed installations such as road networks, terminals, bus sheds/stops, parking lots, walkways, laybys, kerbs, vehicles, and other ancillary facilities required for successful accessibility and mobility functions [3, 5]. In a similar view, road infrastructure refers to structural facilities that help the movement of people, goods, and services through the difference means of transport on the road. This includes the carriageway, pedestrian and cycling facilities (such as walkways, cycle paths, and parking areas), drainage, culverts (box or ring types), bridges and flyovers, street light installations, traffic signs, laybys, traffic lights, and speed breakers, among others [6, 7].

Road infrastructure plays an important role in the growth and development of nation. It does not only facilitate the movement of people, goods, and services from one point to another and where they are effectively developed, it also opens opportunities for freshness of new ideas and technology, thereby facilitates efficient performance of all the national economic sectors [1]. Despite the obvious importance of road transport infrastructure facilities to the nation's development, its development, functionality, and sustainability have still been undermined by various factors, particularly in developing nations including Nigeria. Of particular interest among these causal factors is the unprecedented urbanisation rate, which has been a global issue since the industrial revolution. The alarming rate of urbanization results in an increasing rate of spatial physical development, unprecedented population growth, increasing rates of vehicular ownership, and uncontrolled automobile dependency in cities [3, 4]. The effects of the urbanization trend on road transport infrastructure often

necessitate the development, redevelopment, provision, and implementation of adequate road transport systems, where the issue of infrastructure expansion and new installation becomes very important towards achieving desired economic development.

In most cases, the situation in developing countries, especially in Sub-Saharan Africa, is different from what is obtainable in developed countries. Specifically, the Nigerian road transport system is characterized by inadequate quality road infrastructure facilities, a highly populated and congested road urban network, low capacity facility design, poorly maintained and managed facilities, and wrongly administered facilities. The poor condition of road infrastructure has, ironically, not only hampered smooth traffic movement, but also prolonged travel time, higher travel costs, increased vehicular depreciation, increased pollution, and disruption to vehicular-pedestrian-friendly environment [1]. For instance, in Nigeria, taking evidence from an x-ray of some roads constructed more than 30 years ago, shows that the majority of these roads have not been rehabilitated even once, resulting in major cracks (longitudinal and transverse), depression, broken down bridges, and several potholes that make road transport boring and unsafe for passengers [8, 9], while a high percentage of those that were rehabilitated and are undergoing rehabilitation are obviously quickly deteriorating due to the use of substandard construction materials, poor funding, mismanagement of funds, poor capacity expansion and overutilization of the facilities due to population pressure [4, 10, 11] were of the opinion that the poor state of road infrastructure in Nigeria is accredited to unreliable infrastructural designs, lack of drainage and curvet for easy runoff, the use of very thin coatings which are easily washed away by erosion, excessive use of the road network due to the underdeveloped nature of waterways and railways, the absence of an articulated road program, inadequate funding for road maintenance and poor priority to administration. Meanwhile, the importance attached to the road transport sub-sector based on its singular contribution to local, regional, and national development is reflected in governments' huge resource allocation to road infrastructure in the last three decades. Yet, the resultant effect does not commensurate with the current physical state of road infrastructure development, ease of mobility, and commuting satisfaction, especially in the country's urban areas.

It is against this background that the study assessed government investment in road infrastructure in Kogi State, Nigeria with a view to understanding its impact on urban mobility in the study area. To achieve this aim, the following objectives were explored: We examined the government's investment trend on road transport infrastructure (2008–2018) in Kogi State, Nigeria; examined statistical variation in the road infrastructure development in the study area; examined the statistical influence of annual road infrastructure expenditure on the general state's sectoral budget; and appraised the perceived impact of government investment on road infrastructure on urban mobility performance in the study area.

2. Brief Literature Review

Transport infrastructure plays an acute and reformist role in the economic growth of any nation. Infrastructure plays a significant role in almost all development economic theories proposed by authors such as [11–13], among others. These authors directly or indirectly cogitate infrastructure as a vital determinant of growth and development, as well as how it interacts with the economy through a web of complex economic connections that are captured by collective production, employment, and wellbeing [14]. The impact of transport infrastructure cannot be overemphasized, especially road transport, which is

virtually available and mostly accessible everywhere for the running of daily activities. Provision of this type of infrastructure (road infrastructure) is, however, capital intensive [15]. In Nigeria, according to [16], road infrastructure is usually financed through government budgetary expenditures and there are rival demands on these expenditures. As a result, [17] believed that the government should devise a mechanism to identify the best area for capital investments that will generate alternative sources of funding for road infrastructure provision. This is necessary because of the huge amount required to finance road infrastructure, which the government alone may not be able to finance.

Reference [18] opined that in spite of the annual budgetary allocations for road construction and infrastructure in Nigeria, a great portion of the roads in the country are in deplorable conditions, making mobility or movement difficult for passengers. This shows that the government's budgetary allocation is inadequate to cater for the road infrastructure owing to the vast infrastructure gap in the country. This is not astonishing as the Nigerian government finances its projects through three main sources: oil revenue, taxation, and debts. However, in light of the decreasing global oil prices and concerns regarding Nigeria's rising debt profile, the government has increased its effort on revenue from taxation. To make matters worse, most of these taxes are not fully utilized for the purpose for which they were intended, and in most cases, citizens find it difficult to reap the benefits of their taxes due to corruption and inconsistency in government policy [7].

Similarly, [19] investigated the factors responsible for low revenue, such as tax avoidance, insufficient tax personnel corruption, tax evasion, poor collection mechanisms, free rider problems, rich tax dodgers, tax run, welfare cost of taxation (administrative and compliance costs), terrorism, militancy, and record falsification. All these have a serious impact on the budget and funding of projects (roads inclusive) in Nigeria. Globally, the role of government in the delivery of infrastructure has been a subject of discuss [20]. There is a huge argument as to whether infrastructure investment should be exclusively the responsibility of the government or whether it should attract private participation. As evidenced by road infrastructure in Nigeria, this situation has left users with the problem of not being sure of who to blame for poor infrastructure performance that has astounded Nigeria for so many years [21].

The major dilemma in government investment in road infrastructure, as opined by [22], is relating to the issues of procurement process and funding. According to them, Nigeria was losing an average of \$265 million annually through numerous ways of manipulation of the procurement procedure in the execution and award of public contracts (roads inclusive). These included, among other things, using the contract system to divert public funds to private pockets, hiring inexperienced contractors, inflating contract costs, awarding contracts for non-existent projects, over-invoicing, project peddling, awarding contracts to friends, relatives, and family members, and awarding contracts without adequate planning and budgetary provisions identified as the major causes of public project abandonment and, of course, a major threat to sustainable infrastructure development in Nigeria [23]. In a similar way, [24] also observed that policy formulation on infrastructure development being undertaken with the least input of construction professionals at a macro-economic level hindered government investment on public projects. Besides, sensitive stages, particularly identification, definition, planning, and budgeting, for the infrastructure sector at macro-level have also been condemned to be dominated majorly by the executive arm of the government with least input from the construction professionals [22, 25]. By the way, the policy makers

who provide the blueprint for infrastructure development in both the national and state budgets lack adequate knowledge of the complex high-tech processes of construction and the cost characteristics of infrastructure construction, which are invariably critical to poor road infrastructure sustainability in Nigeria [24]. In other words, several authors, such as [14, 26, 27], among others, have carried out studies on this area, and their studies mainly focus on the government's investments in transport infrastructure and economic growth in Nigeria, but fail to examine how government investment in road infrastructure has affected urban mobility. This stands as the research gap that this study tends to reveal, especially with reference to Kogi State, Nigeria.

3. Materials and Methods

3.1. Study area

Kogi State, Nigeria was cut out of Kwara State and Benue State in 1991 and is one of the States in the North Central area of Nigeria with a population of 3,314,043. The State is situated between the latitudes $7^{\circ}30'1''N$ and $7^{\circ}52'1''N$ and the longitudes $6^{\circ}38'1''E$ and $6^{\circ}42'1''E$. Kogi State contains of twenty-one (21) local government areas and these are Adavi, Ajaokuta, Ankpa, Bassa, Dekina, Ibaji, Idah, Igalamela-Odolu, Ijumu, Kabba/Bunu, Koton-Karfe, Lokaja, Mopa-Muro, Ofu, Ogori/Magongo, Okehi, Olamaboro, Omala, Yagba East and Yagba West. The modes of transportation in the state include road and water transportation. Figure 1 shows a map of Nigeria showing Kogi state in a national setting.

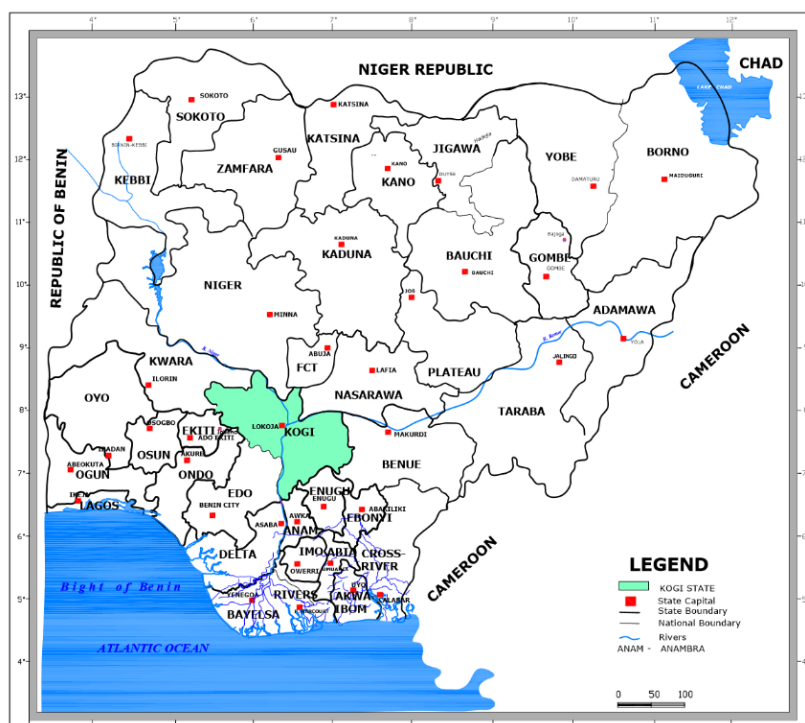


Figure 1. Nigeria showing Kogi State.

Sources: [1].

3.2. Methodology

A mixed-method research design that detailed the use of qualitative and qualitative data was adopted in this study. This was found to be appropriate due to the nature of the required data and the method of results presentation. Supporting the appropriateness of the research design is the study of [1, 3, 26, 27]. The study used both primary and secondary

sources of data, while structured questionnaires and personal observation were the primary sources of data employed. The population census figure for Kogi State obtained from the National Population Commission, Lokoja, and budgetary allocation to road infrastructure in Kogi State from 2008 to 2018, which was used as a measure for government investment in road infrastructure and was sourced from the Ministry of Budget and Planning and validated by the Ministry of Work and Urban Development, Lokoja, respectively, were the secondary data sourced for the study.

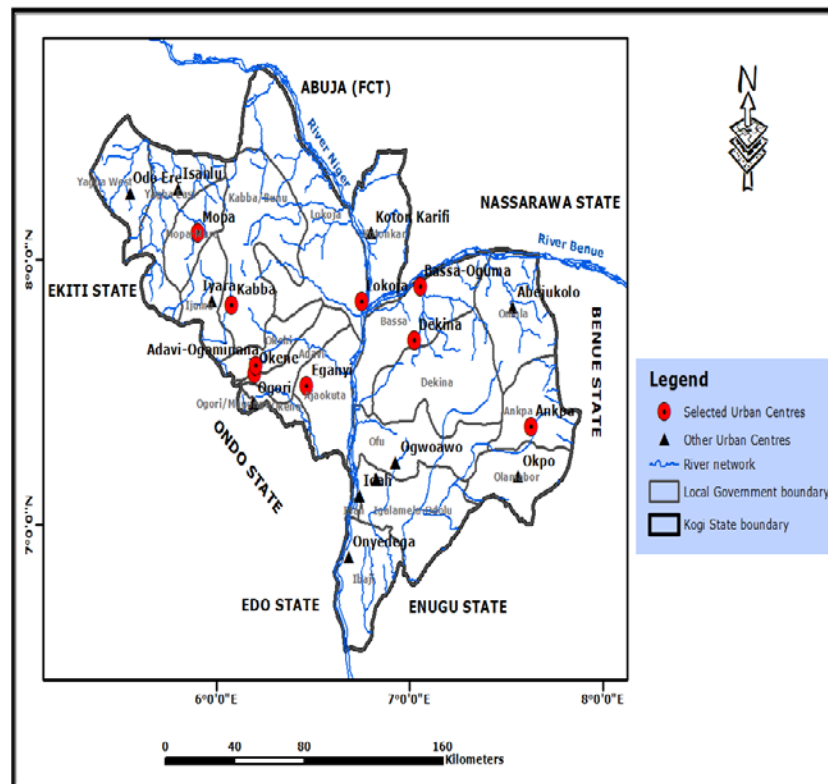


Figure 2. Kogi State showing selected Urban Centres for the Study.

For the purpose of determining the extent of the perceived impact of budgetary allocation to road infrastructure in Kogi State on urban mobility and the sample size for the study, the study selected respondents from nine (9) major urban centres, namely: Adavi, Okene, Ajaokuta, Kabba-Bunu, Lokoja, Ankpa, Dekina, and Bassa-Oguma. These urban centres represent the major economic hubs of the state and also generate a lot of traffic, especially on market days. The population census results from the 2006 National Population Census of the selected urban centers in the study area were obtained and summed up to be 1,717,087 people. This result was projected to 2018 at a growth rate of 2.8%, which amounted to 2,321,140, out of which 1658 of the household heads in the selected urban centres were sampled with the aid of structured questionnaires using a purposive and random sampling method. The purpose of the purposive sampling is to ensure that only urban dwellers (household heads) that reside in each of the selected urban centres are sampled, while the random technique is to ensure that individual household heads in each of the selected urban centres have an equal right to be sampled. The study administered one thousand, six hundred and fifty-eight (1,658) questionnaires to the household heads across the selected urban centres, out of which one thousand, two hundred and fifteen (1,215) were retrieved and analysed for the study (Table 1).

The data used to assess urban dwellers' perceptions of the extent of the impact of budgetary allocations to road infrastructure on urban mobility were presented with the aid of descriptive statistics. The variables used were measured on a 5-point Likert scale, and their weighted mean was also adopted as a decision rule to substantiate urban dwellers' perception of the extent of the impact of budgetary allocation to road infrastructure on urban mobility. The weighted mean scores used for the parameters by the study were sourced from the studies of [1, 28] where the level of impact as perceived by the respondents was ranked between intervals and reflected as 4.20–5.00 = (Highly Impactful); 3.40–4.19 = (Impactful); 2.60–3.39 = (Averagely Impactful); 1.80–2.59 = (Fairly Impactful); and 1.00–1.79 = (No impact).

Furthermore, annual budgetary allocation data from 2008–2018 was also analysed descriptively to determine the percentage of general budget allocation to road infrastructure, annual differences, annual budget performance of road infrastructure, annual rate of amount budgeted to road infrastructure, and annual percentage growth rate of the amount budgeted to road infrastructure, respectively. While inferential statistics techniques such as the Student "t" test and linear regression were used to establish the statistical difference in the road infrastructure development in the study area and the statistical influence of annual road infrastructure expenditure on the general state's sectoral budget, respectively. However, both the descriptive and inferential statistics were achieved through the use of the Statistical Package for Social Science (SPSS), IBM version 25.

Table 1

Summary of questionnaire administered

S/ N	Name of Settlements	X1 2006 Population Figure*	X2 2017 Projected Population Figure**	X3 Household Heads to be Sampled**	X4 0.005% of Household Heads (Sample Size)**	X5 Number of Questionnaire Received**
Urban Centres						
1.	Adavi	217,219	294,332	42,047	210	150
2.	Okene	325,623	434,707	62,101	311	205
3.	Ankpa	266,176	360,668	51,524	258	200
4.	Dekina	260,968	353,612	50,516	253	195
5.	Mopa-Amuro	43,760	59,295	8,470	42	35
6.	Kabba/Bunu	144,579	195,905	27,986	140	80
7.	Lokoja	196,643	266,451	38,064	190	150
8.	Ajaokuta	122,432	165,895	23,699	119	100
9.	Bassa	139,687	189,276	27,039	135	100
	Total	1,717,087	2,321,140	331,591	1,658	1,215

Source: *National Population Commission 2006; **X2, X3, X4 and X5 – Authors' computation, 2021.

4. Results

4.1. Government investment in road transport infrastructure for urban mobility

Government investment in infrastructure (roads inclusive) is normally captured in the annual budget. The government budget is the major instrument for the successful implementation of fiscal policy designed to attain specific objectives. Financial operations of the government are properly planned and administered through budgeting. The budget

provides a scientific and systematic way of presenting items of public expenditure and revenue. Provision of road infrastructure (construction of new roads, rehabilitation or maintenance of the existing ones) in Nigeria is dependent on allocations from the public treasury, which are sourced through the budget allocation to the Federal Ministry of Works at the federal level and the State Ministry of Work, respectively.

In order to determine the percentage of the amount budgeted for road infrastructure in Kogi State since 2008-2018, the total annual budget for the entire sector of the state and the budget for road infrastructure in Kogi State since 2008-2018 were sourced from the Ministry of Budget and Planning in Lokoja and presented in Table 2. From Table 2, it was revealed that out of the total annual budget for Kogi State in 2008, only 0.88% of the budget went to road infrastructure, and in 2009 (0.79%), 2010 (0.67%), 2011 (0.66%), 2012 (2.13%), 2013 (0.55%) and 2014 (0.53%). In 2015 and 2016, the percentage increased to 8.59% and 6.15%, respectively, while in 2017 it decreased to 0.96% and then increased to 4.23% in 2018. Although, according to the Ministry of Works and Urban Development Lokoja (2019) cited in Ref. [1], the variation in percentage allotted to road infrastructure in Kogi State is determined by the allocation received from the Federal Government.

It was also revealed from Table 2, that there was a discrepancy in the annual budgetary allocation of the State from 2008–2018. For instance, there was a positive increase in the budget allocation for the years 2009, 2011, 2012, 2015, 2016, and 2018 respectively. This may be due to the increase in federal allocation to the state during the above years. However, it was also revealed that there was a decrease in the budget allocation of Kogi State in the years 2008, 2013, 2014, 2016, and 2017 respectively. Considering the road infrastructure budget performance in Kogi State from 2008-2018 as presented in Table 3, it was discovered that there was a surplus of N 69,633,906.45 in 2008, N 58,157,935.00 in 2010, N 6,770,463.61 in 2014, N 134,433,920 in 2017 and N 2,562,500,000 in 2018. More so, there was a deficit of –N 55,800,000 in 2009 and N 380, 949,000 in 2012, respectively. Interestingly, there was a balance in the budget performance in the years 2011, 2013, 2015, and 2016 respectively.

Furthermore, the percentage growth rate of the amount budgeted for road infrastructure from 2008–2018 shown in Table 2 indicated that there was a mixed positive and negative percentage growth rate over the years between 2008 and 2018. The positive rates indicate a corresponding percentage increase in the amount budgeted for road infrastructure, while the negative rates show a corresponding percentage decrease in the amount budgeted for road infrastructure in Kogi State in comparison with the previous year. The height percentage growth rate accounted for 762.1% of the total recorded in the year 2015 (see Figure 3). This implies an increase in the amount budgeted for road infrastructure in Kogi State in the year 2015.

Reference [21] observed that the percentage growth rate experienced in the year 2015 was a strategy adopted by the then administration to ensure continuity of governance and road development in the State. A negative percentage growth rate of -63.5% was recorded in the year 2017. Although the pattern of fluctuation of the annual growth rates from 2008-2018 has not been stable concurrently, for instance, the percentage growth rate in 2009 accounted for 33.6% and 6.7% in 2011. Interestingly, the percentage growth in the amount budgeted for road infrastructure in Kogi State increased from 221.6% in 2012 to 271.9% in 2018. It was also indicated that there was a decrease (-14.7%) in the percentage growth rate in the amount budgeted for road infrastructure in Kogi State in 2010, with a decrease of 59.5% in 2013, -7.8% in 2014, and -39.5% in 2016, respectively. According to [21], the

decrease in percentage growth rate in the amount budgeted for road infrastructure was due to a reduction in the Federal Government's allocation to the State coupled with the economic meltdown impeding the State.

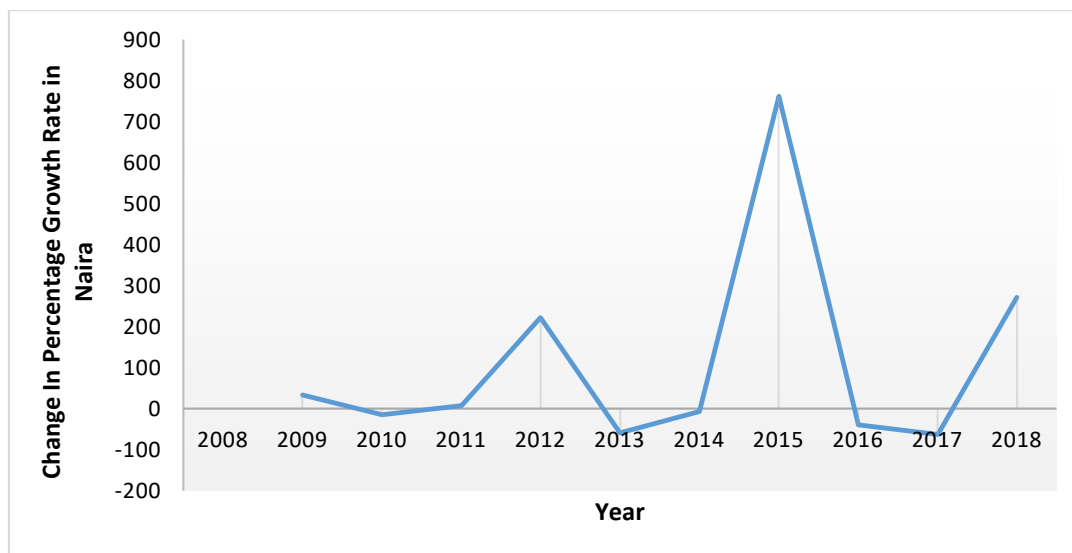


Figure 3. Percentage growth rate in the amount budgeted to road infrastructure in Kogi State from 2008-2018.

Source: Authors' field survey, 2021.

Furthermore, it is interesting to note that the year 2015 received the highest budgetary allocation for road infrastructure since 2008–2018, and the whole amount budgeted for the year was spent on road development in Kogi. This investment is evidenced by the reduction of road accidents experienced between 2015 and 2016 as revealed in Figure 4.

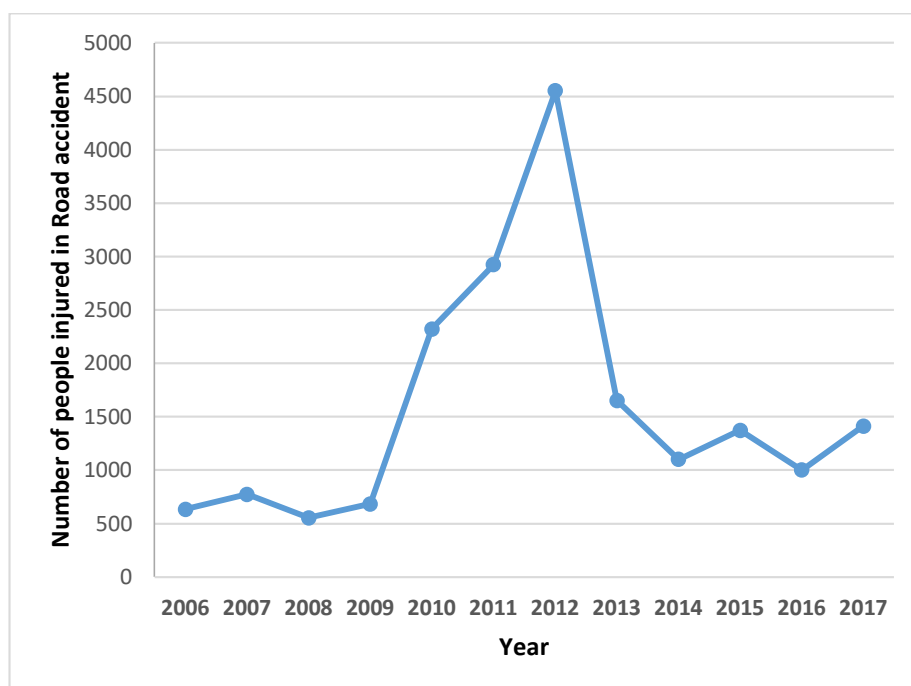


Figure 4. Trend of number of people injured in road accident in Kogi State from 2006-2017.

Source: Authors' field survey, 2021.

Table 2

Annual budgetary allocation of Kogi State to all sectors and proportion of budgetary Allocation to road infrastructure in Kogi State, Nigeria from 2008-2018

Year	X1 General Annual Budget of all Sector (in Billion Naira)*	X2 Proportion of Budget Allocation (in Million Naira) to Road infrastructure*	X3 % of General Budget Allocati on to Road infrastructure**	X4 Annual Differ ences**	X5 Amount Spent (Expenditur e) on Road Infrastructu re**	X6 Annual Budget Performance of Road Infrastructure**	X7 Annual Growth Rate of Amount Budgeted to Road infrastructure**	X8 Annual Percenta ge Growth Rate of Amount Budgeted to Road infrastructure**
2008	52,370,268,698	464,226,043.00	0.88		394,592,136.55	69,633,906.45 (Surplus)	-	-
2009	77,628,845,567	620,000,000.00	0.79	+	675,800,000.00	-55,800,000.00 (Deficit)	155,777,957	33.6
2010	78,537,755,346	528,708,500.00	0.67	-	470,550,565.00	58,157,935.00 (Surplus)	-91,291,500	-14.7
2011	85,588,476,370	564,000,000.00	0.66	+	564,000,000.00	Balance	35,291,500	6.7
2012	85,230,543,667	1,814,000,000.00	2.13	+	2,194,949,000.00	-380,949,000.00 (Deficit)	1,250,000,000	221.6
2013	132,676,855,415	734,401,394.00	0.55	-	734,401,394.00	Balance	-1,079,598,606	-59.5
2014	128,720,397,305	677,046,361.42	0.53	-	670,275,897.81	6,770,463.61 (Surplus)	-57,355,032.58	-7.8
2015	88,617,070,854	7,620,000,000.00	8.59	+	7,620,000,000.00	Balance	6,942,953,638.58	762.1
2016	74,996,241,381	4,609,621,422.00	6.15	-	4,609,621,422.00	Balance	-3,010,378,578	-39.5
2017	174,851,544,523	1,680,424,000.00	0.96	+	1,545,990,080.00	134,433,920.00 (Surplus)	-2,929,197,422	-63.5
2018	147,835,583,324	6,250,000,000.00	4.23		3,687,500,000.00	2,562,500,000.00 (Surplus)	4,569,576,000	271.9

Source: * X1-X2 Authors' field survey, 2021; ** X3- X8- Authors' computation, 2021.

In addition, [21] claimed that from 2008 to 2018, more than 80% of the amount allocated for road infrastructure was normally released by the government and spent on outlined projects. According to them, the amount budgeted and subsequently released for road infrastructure cannot, in most cases, complete the outlined projects due to sudden inflation in the cost of materials budgeted for. Because of this, most projects are kept in abeyance until adequate funds are made available for the completion of the project. Reference [24] stressed that to maintain and sustain road infrastructure that will have a relative impact on urban mobility in Kogi State, between 100 and 120 million should be released annually by the state government for the provision and maintenance of road

infrastructure. This is because Kogi State attracts heavy traffic from the Southern, Western, Eastern and Northern parts of Nigeria, coupled with the fact that the state is endowed with industries such as Obajana Cement Company, Itakpe Iron Company, Ajaokuta Steel Company, North-West Ceramic Company at Niger Bridge, Itobe, among others, that rely on truck for the movement of their finished goods in and out of the State. Corroborating the above, [24] declared that nothing less than 120 billion Naira is required annually to maintain and sustain the Nigerian roads. This amount is required because most vehicles plying the roads carry as much as 70 to 100 tons of load against their stipulated 30 ton designed capacity.

Nationally, it has been reported by [9] that road infrastructure has received a larger share of budgetary allocation compared to other modes of transportation. The government's significant commitment to the road sector can be seen in government investment or resources allocated to the sector over the last decades. For example, the road sub-sector, which accounted for 54% of the federal government's total public sector capital investment in transport planned right from the first national development plan till date, received not less than 70% of the allocation with a progressive yearly incremental allocation of resources related to other modes [9]. Nevertheless, the state of road infrastructure in Nigeria, in spite of the huge amount of money allotted to it, has become a subject of debate because the amount could not corresponding with the state of the roads in terms of a good road network, arbitrating from the observable and eye-catching proof and facts derivable from the road transport condition in the country [5, 9].

4.2. Trend difference in the road infrastructure development in the study area

Further investigation was carried out using a measure of annual expenditure on road infrastructure in order to determine whether there is a trend difference in the development of road infrastructure in the study area. This was achieved using student "t" test statistics and the result is presented in Table 3.

Findings from Table 3 show that there is a statistically significant difference in the road infrastructure development across the state in the observed period of years as the calculated p-value ($t = 3.021$, sig. 2-tailed = 0.000) reaches the level of significance (that is less than 0.05 table value).

The result indicates that the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. Hence, by implication, the road infrastructure projects of the years in the study area might not have reached the desired result in terms of the impact of urban ease of commuting and navigation, but there has been a statistical difference in the road infrastructure projects over the observed period of years.

Table 3

One-sample "t" test statistics of the trend difference in the road infrastructure development

2		N	Mean	Std. Deviation	Std. Error Mean	
Road Infrastructure Expenditure		11	2106152772.3055	2312237346.29848	697165791.26537	
95% Confidence Interval of the Difference						
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
Road Infrastructure Expenditure	3.021	10	.013	2106152772.30545	552770586.5113	3659534958.0996

Source: Authors' field survey, 2021.

4.3. Influence of annual road infrastructure expenditure on the state's general sectoral budget

In a bid to understand the statistical influence of the annual road infrastructure expenditure on the state's general sectoral budget, further investigation was conducted using linear regression analysis to explain not only the relationship between the state's general sectoral budget (dependent variable) and road infrastructure expenditure (independent/predictor variable), but also the extent to which the dependent is significantly influenced by the predictor variable. The result of the analysis is presented in Table 4 as the summary of the regression analysis of the statistical influence of the annual road infrastructure expenditure on the state's general sectoral budget. The result of the F-ratio of ANOVA (Table 4) in the regression model shows 92.776 with an observed significant value of 0.000. While comparing the observed significant value with the table level of significance, it is clear that the observed significant value ($p = 0.000$) is less than the table significant value (0.05). Hence, we accept the alternative hypothesis (H_1) and reject the null hypothesis (H_0). This implies that the annual road infrastructure expenditure statistics significantly influence the state's general sectoral budget. Furthermore, the model through the adjusted R square results (Table 4) shows 80% of the variation explained. This means that the independent variable (road infrastructure expenditure) is able to predict and explain the dependent variable's state's general sectoral budget with an 80% explained variation. In other words, every unit change in the state's general sectoral budget in the study area will cause a unit increase in road infrastructure development.

Table 4

Regression analysis of the influence of annual road infrastructure expenditure on the general state's sectoral budget

General State of Kogi State Annual Budget						
Model Summary						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate		
1	.855 ^a	.812	.802	724787583.89322		
a. Predictors: (Constant), Kogi State Annual Budget						
ANOVA ^a Result						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	487365620802823 50000.000	1	48736562080282350 000.000	92.776	.000 ^b
	Residual	472785337589194 4400.000	9	52531704176577158 0.000		
	Total	534644154561743 00000.000	10			
a. Dependent Variable: Road Infrastructure Expenditure						
b. Predictors: (Constant), Kogi State Annual Budget						
Coefficients ^a						
Model	Unstandardized Coefficients			Standardized Coefficients	t	Sig.
	B	Std. Error		Beta		
1	(Constant)	128326503.036	299866969.213		.428	.679
	Kogi State Annual Budget	.851	.088	.955	9.632	.000
a. Dependent Variable: Road Infrastructure Expenditure						

Source: Authors' field survey, 2021

4.4. Impact of government investment on road infrastructure to urban mobility

Mobility is an integral part of human life. A man moves around to satisfy his needs in terms of visiting friends and family, leisure, shopping, among others. The comfort driven by mobility is directly connected to the level of transport infrastructure available. Evidence from this study (see Table 5) shows the respondents' perception of the impact of government investment on road infrastructure on urban mobility in Kogi State, Nigeria. The analysis of the results revealed that the majority of the respondents in the selected urban centres opined that the government's investment in road infrastructure for urban mobility is fairly impactful, as evidenced by Adavi, Okene, Dekina, Ajaokuta, and Lokoja. In Ankpa and Kabba-Bunu, it was impactful, while the situation in Mopa-Amuro and Bassa-Ogun showed no impact. The reason for this is that the majority of the roads connecting these areas have been abandoned or neglected, thereby making mobility difficult for the people in the area.

The urban dwellers' ranking of the impact of government investment on road infrastructure on urban mobility is a direct reflection of the visible and eye-catching evidence of dilapidated road conditions, poor traffic management, poor quality of transport service, inadequate road and traffic signs, among others, in Kogi State. In agreement with the above, [12] opined that lots of money has been spent and contracts awarded to revamp road infrastructure in Nigeria, with clear evidence from the budgetary allocation to the road sector, yet the effort has had little or no impact on mobility as revealed by road users due to corruption and failure to award contracts to qualified construction companies.

In the same vein, [29] averred that government investment in road infrastructure in Kogi State is fairly impactful on urban mobility. The Ministry noted that the bureaucratic process involved in budgetary allocation weakens the input-output of any projects (roads inclusive) in the state. The intermittent and under-approval of funds for projects tends to increase project cost, reduce project quality, and increase the risk of project abandonment. Where they are not abandoned, they are poorly maintained due to the paucity of funds.

Table 5

Impact of government investment on road infrastructure to urban mobility

S/ N	Urban Centres	Respondents perception of the impact of government investment on road infrastructure to urban mobility					Weighted Mean	Remark
		No impact	Fairly impactful	Impactful	Very impactful	Highly impactful		
1.	Adavi	10	80	35	21	4	2.5267	FI
2.	Okene	27	94	63	15	6	2.4098	FI
3.	Ankpa	22	20	90	38	30	3.1700	I
4.	Dekina	56	99	30	10	-	1.9692	FI
5.	Mopa-Amuro	14	21	-	-	-	1.6000	NI
6.	Kabba-Bunu	10	15	50	5	-	2.6250	I
7.	Lokoja	25	80	30	-	-	2.2333	FI
8.	Ajaokuta	32	60	8	-	-	1.8100	FI
9.	Bassa-Oguma	70	20	10	-	-	1.4000	NI

Note: Key Index Remark: 1.00-1.79 - D - (No Impact); 1.80-2.59 - FS - (Fairly Impactful); 2.60-3.39 - I - (Impactful); 3.40-4.19 - VI - (Very Impactful); 4.20-5.0 - HS - (Highly Impactful). Source: Authors' field survey, 2021.

5. Discussion

The major source of government investment in infrastructure is annual budgetary allocation to the Federal Ministry of Works at the Federal Government level and the Kogi State Ministry of Work, where provision is made for road transport infrastructure, including the construction of new roads and the rehabilitation or maintenance of existing ones. However, there is inconsistency in the proportion of budget allocation to the transport infrastructure sector over the years, with 0.88% of the total annual budget for Kogi State in 2008 recording the period with the least allocation. The effects of fluctuation in budgetary provision on transportation infrastructure include poor mobility performance and declining service quality of road transport infrastructure, whereas increased budgetary provision leads to increased road transport infrastructure development. This is in tandem with the position [1, 29] that investment in road infrastructure led to the reduction of road accidents experienced between 2015 and 2016, and the variation in percentage allotted to road infrastructure is determined by the allocation received from the Federal Government, the economic meltdown impeding the State and the condition of the internally generated revenue of the State. Also, the study revealed that between \$100 and \$120 million is required annually to maintain and sustain road infrastructure that will have a relative impact on urban mobility due to heavy traffic from all parts of the country that transits the state. Corroborating the above, [1] declared that nothing less than 120 billion Naira is required annually to maintain and sustain the roads. This amount is required because most vehicles plying the roads carry as much as 70 to 100 tons of load against their stipulated 30 ton designed capacity.

Furthermore, road infrastructure has received a larger share of budgetary allocation compared to other modes of transportation in the State. Corroborating the study of [1] that opined the road sub-sector accounted for 54% of the federal government's total budget for capital investment in transport from the first national development plan till date and received more than 70% of the allocation with a progressive annual incremental allocation of resources compared to other modes. Yet, the state of road infrastructure in Nigeria, regardless of the huge amount of money assigned to it, has become a subject of investigation because the amount allocated to road transport could not commensurate with the level of road infrastructure development especially in terms of a good road network, judging from the observable and eye-catching evidence. This is consistent with the findings of [7, 8, 30].

With respect to the trend difference in the road infrastructure development in the study area, it is revealed that there is a statistically significant difference in the road infrastructure development across Kogi state in the observed period of years. By implication, the road infrastructure development over the years in the study area might not have reached the desired result in terms of the impact of urban ease of commuting and navigation, but there has been a statistical improvement in the road infrastructure development over the observed period of years. This findings is novel.

Furthermore, on the relationship between the state's general sectoral budget and road infrastructure expenditure, findings revealed that the annual road infrastructure expenditure statistics significantly influence the state's general sectoral budget. By implications, the study revealed that for every unit change in the state's general sectoral budget in the study area will cause a unit increase in road infrastructure development. The findings corroborate the study of [10].

On the perceived impact of government investment on road infrastructure on urban mobility is varied across the state. Findings revealed that areas such as Adavi, Okene, Dekina, Ajaokuta, and Lokoja opined that the government's investment in road infrastructure for urban mobility is fairly impactful, while it simply impactful in Ankpa and Kabba-Bunu and have no impact on the mobility in Mopa-Amuro and Bassa-Ogun areas due to the fact that the majority of the roads connecting these areas have been abandoned or neglected, thereby making mobility difficult for the people in the area. Hence, the findings revealed a uniform impact level in the study area. In agreement with the latter, [11] opined that lots of money are been spent and contracts awarded to revamp road infrastructure across Nigerian communities, with clear evidence from the budgetary allocation to the road sector, yet the effort has had little or no impact on mobility as revealed by road users due to high level of corruption and failure to award contracts to qualified professionals. In the same vein, [1, 30] averred that government investment in road infrastructure in some part of Kogi State is fairly impactful on urban mobility due to the bureaucratic process in budgetary allocation that weakens the input-output of any projects (roads inclusive) in the state. This finding is in tandem with findings [10, 30] that the intermittent and under-approval of funds for projects tends to increase project cost, reduce project quality, and increase the risk of project abandonment. Where they are not abandoned, they are poorly maintained due to the paucity of funds.

6. Conclusions

This study has assessed government investment in road infrastructure and its impact on urban mobility in Kogi State, Nigeria. The findings of the study revealed that the year 2015 received the highest budgetary allocation for road infrastructure from 2008–2018. This is evidenced by the reduction of road accident experiences between the years 2015 and 2016 respectively. This study found that the road infrastructure projects of the years in the study area might not have achieved the desired result in terms of the impact of urban ease of commuting and navigation, but there has been a statistical difference in the number of delivered road infrastructure projects over the observed period of years in the study area.

Meanwhile, this study also found that the annual road infrastructure expenditure statistics significantly influence the state's general sectoral budget. By implication, it concludes that a unit change or increase in the state's general sectoral budget in the study area will cause a unit increase in road infrastructure development. Furthermore, our study findings also show that government investment in road infrastructure for urban mobility is fairly impactful based on the perception of the urban dwellers in Adavi, Okene, Dekina, and Lokoja. It was impactful in Ankpa and Kabba-Bunu, while the situations in Mopa-Amuro, Ajaokuta, and Bassa-Ogun showed no impact.

Based on the foregoing, our study concludes that there is a need to improve and increase the budgetary allocation for transport infrastructure development, especially for road infrastructure in the states, for improved mobility and logistics performance. As a result, this study recommended that budgetary allocations for road infrastructure in the areas of construction, rehabilitation, and maintenance should be given top priority in the state, taking cognizance of the fact that Kogi State is an intervening state that usually harvests traffic from the South, West, East, and North of Nigeria. This budgetary allocation should be adequately disbursed and judiciously spent on the outlined road projects. This could be done by specifying the spending plans for road infrastructure projects. Also, the Ministry of Works and

Urban Development in Kogi State and all other stakeholders involved in road provision should ensure proper monitoring and evaluation of road projects awarded yearly to ensure efficient and effective execution of projects. This can be done through constant supervision of the project sites by professionals in the field of road building at regular intervals till the end of the project. This will serve as a means of checking the quality of materials used for road construction and maintenance. An independent control and monitoring department should be established at state and local government level to control and monitor the activities of road project contractors for the purpose of achieving successful road project delivery that will ensure sustainability of urban mobility. This will go a long way towards impacting the lives of every road user in the state by ensuring seamless urban mobility.

Acknowledgments. Special appreciation to the Kogi State Government and the residents of the State.

Conflicts of Interest. The authors declare no conflict of interest. Also, “the funding sponsors had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, and in the decision to publish the results”.

References

1. Olorunfemi, S.O. Road infrastructure and urban mobility in selected urban centres in Kogi State Nigeria. Unpublished Ph.D. Thesis, Federal University of Technology Akure, Akure (Nigeria), 2021.
2. Adeniji, K. Transport challenges in Nigeria in the next two decades. *Nigeria Institute of Social and Economic Research* 2000, 1(3), pp. 40-67.
3. Salisu, U.O. State of transport administrative structure in Lagos, Ogun and Oyo states, Nigeria. *Journal of Spatial and Organizational Dynamics* 2019, 7(1), pp. 68-85.
4. Akanmu, A.A.; Salisu, U.O.; Fasina, S.O.; Sanni, S.M.; Olatunji, O.M.; Faleti, C.A. State of urban transport in a Nigerian traditional city. *Transport and Communications* 2020, 8(2), pp. 1-12.
5. Kendrick, P.; Copson, M.; Beresford, S.; McCormick, P. *Roadwork: Theory and Practice*, 5th ed.; Oxford: Elsevier Butterworth-Heinemann, Amsterdam, Netherlands, 2004; pp. 6-17.
6. Abdulkareem, Y.A.; Adeoti, K.A. Road maintenance and national development. *Journal of Nigerian Society of Engineers* 2004, 35(3), pp. 20-28.
7. Mayaki, H.M. *An evaluation of government provision and maintenance of infrastructures in Nigeria: The case of road transport infrastructure*. Unpublished M.Sc. Thesis, Ahmadu Bello University, Zaria (Nigeria), 2014.
8. *Central Bank of Nigeria*. Highway maintenance in Nigeria: Lessons from other countries. Central Bank of Nigeria Research Department: Abuja, Nigeria, 2003.
9. Hamza, Y. *An Assessment of Road Transport Infrastructure Development in Kaduna State, Nigeria*. Unpublished M.Sc. Dissertation, Ahmadu Bello University, Zaria (Nigeria), 2016.
10. Salisu, U.O. Analysis of transport administrators in sustaining transport development in Lagos, Ogun and Oyo State, Nigeria. *Journal of Research in National Development* 2017, 15(1), pp. 191-203.
11. Harrod, R.F. *Towards a dynamic economics*. Ed. Macmillan: New York, United States, 1948, pp. 56-76.
12. Domar, E.D. Capital expansion, rate of growth and employment. *Econometrica* 1947, 14(2), pp. 137-147.
13. Solow, R.M. A contribution to the theory of economic growth. *Quarterly Journal of Economics* 1956, 70(1), pp. 65-94.
14. Adebosin, W.G.; George, E.O.; Salami, L.A.; Saula, D.T. Relative impact of transport infrastructure investment on sectoral growth in Nigeria. *EuroEconomic* 2019, 2(38), pp. 324-335.
15. Hesse, M.; McDonough, E. Ports, cities and the global maritime infrastructure. In *Handbook on the Geographies of Globalization*; Kloosterman R., Mamadouh V., Terhorst P. Eds.; Edward Elgar Publisher, Cheltenham, United Kingdom, 2018; pp.5-15. <https://doi.org/10.4337/9781785363849.00038>.
16. Adebosin, W.G.; Toriola, A.K.; Salami, L.A.; Saula, D.T.; Ayanwale, A.A. The effect of infrastructural investment on sustainable development in Nigeria (1980–2016). *Izvestiya* 2019, 2, pp. 148–163.

17. Suleiman, Y.; Ajayi, A.; Abass, S.; Rukaiyyat, O. The relationship between road infrastructure budgetary expenditures and commercial property investment returns. Case study of Fadikpe Area Minna, Nigeria. *Baltic Journal of Real Estate Economics and Construction Management* 2020, 8, pp. 187–196.
18. *Tax and road infrastructure development in Nigeria: The nexus*. January 2019. Available online: <http://blogs.worldbank.org/developmenttalk/how-roads-support-development> on 23th January, 2021 (accessed on 23 January 2021).
19. Ndubuisi, O. Taxation alternatives source of revenue Nigeria: a domineering evidence of petroleum profit tax. *European Journal of Business and Management* 2018, 10 (20), pp. 41-55.
20. Francis, P.U.; John, O.U. Urban infrastructure provision in Nigeria: A Critique of the Funding Strategy. *Saudi Journal of Business and Management Studies* 2017, 2(3), pp. 56-263.
21. Offem, B.; Atser, J. Social planning and good governance: A review of methodologies in infrastructural development and management in Nigeria. In *Physical Development of Urban Nigeria*; Ekop O.B. et al., Eds.; Development Universal Consortia, Lagos, Nigeria, 2007, pp.97-110.
22. Opawole, A.; Jagboro, G.O.; Babatunde, S.O.; Opawole, M.O. Critical factors in road infrastructure development in Osun state, south western Nigeria. *International Journal of Development and Sustainability* 2013, 2(1), pp. 240-253.
23. Babalola, O.; Babatunde, S.O.; Opawole, A. Financial probity in public projects procurement and millennium development goals. *Ife Journal of Environmental Design and Management* 2010, 4(2), pp. 15- 22.
24. Oforeh, E.C. The Nigerian institute of quantity surveyors As an Agent of Economic Development. In *Proceedings of the 22nd Biennial Conference and General Meeting of the Nigerian Institute of Quantity Surveyors*, Calabar, Nigeria, 22-25 November 2006.
25. Mogbo, T.C. The construction sector and the economic growth of Nigeria, 1981-1995. *Journal of the Nigerian Institute of Quantity Surveyors* 2001, 35(2), pp. 8-13.
26. Oyesiku, K.; Onakoya, A.B.; Folawewo, A. An empirical analysis of transport infrastructure investment and economic growth in Nigeria. *Social Sciences* 2013, 2(6), pp. 179-188.
27. Mohammed, A.M. Sustainable funding for the maintenance of critical urban infrastructure in Nigeria. *Kampala International University Journal of Social Sciences* 2021, 7(1), pp. 91- 102.
28. Fadare, S.O.; Adeniran, A.O. Comparative analysis of public operated airport terminal and concessioned airport terminal in Lagos, Nigeria. *Discovery* 2018, 54(272), pp. 304-318.
29. Olorunfemi, S.O. *Assessment of On-Street Parking in Lokoja, Nigeria*. Unpublished Master Thesis, Federal University of Technology Akure, Akure (Nigeria), 2013.
30. Gbadamosi, M.O.; Akanmu, A.A. Insufficient resources as bane of transportation development: The way forward. In *Proceedings of the 11th National Conference of the School of Business Studies*, The Federal Polytechnic, Ado-Ekiti, 5-7 October, 2018.

Citation: Olorunfemi, S. O.; Akanmu, A. A.; Salisu, U. O. Government investment on road infrastructure in Kogi State, Nigeria: the impact on urban mobility. *Journal of Social Sciences* 2022, 5 (3), pp. 88-104. [https://doi.org/10.52326/jss.utm.2022.5\(3\).07](https://doi.org/10.52326/jss.utm.2022.5(3).07).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).08](https://doi.org/10.52326/jss.utm.2022.5(3).08)
UDC 65.011.4:004



EFFICIENCY INDICES OF INVESTMENT IN IT PROJECTS WITH EQUAL LIVES

Ion Bolun*, ORCID ID: 0000-0003-1961-7310,
Svetlana Ghetmancenco, ORCID: 0000-0003-0909-1669

Technical University of Moldova, 168 Stefan cel Mare blvd., Chisinau, Republic of Moldova

*Corresponding author: Ion Bolun, ion.bolun@isa.utm.md

Received: 04. 27. 2022

Accepted: 06. 12. 2022

Abstract. Theoretical results not always give an unambiguous answer regarding the preference of using the indices of efficiency of investment in IT projects with equal lives. To complement some of such results, the Net Present Value (NPV), Profitability (PI) and Internal Rate of Return (IRR) indices are researched by computer simulation. In this aim, a model of comparative analysis of projects with equal lives is defined and the SIMINV application is made up. Using SIMINV, the percentage of cases when the solutions, obtained according to indices of each of the pairs {NPV, PI}, {NPV, IRR}, {PI, IRR} or of the triplet {NPV, PI, IRR}, differ for seven groups of alternatives of initial data is determined. Based on done calculations, some properties of indices were identified, including: the quantitative features and the character of dependences on initial data; the average percentage of cases with different solutions, which is of approx. 9 % for the pair of indices PI and IRR, and of 34-35 % for the other two pairs of indices specified above. On average, the solutions of comparing the efficiency of projects with equal lives, obtained using the NPV, PI and IRR indices, does not coincide in more than 1/3 of cases.

Keywords: *comparative analysis, computer simulation, internal rate of return, net present value, profitability index.*

Rezumat. Rezultatele teoretice nu întotdeauna oferă un răspuns univoc privind preferințele de aplicare a indicilor de eficiență a investițiilor în proiecte IT de durată similară. Pentru a complementa rezultate cunoscute, indicii Valoarea Actualizată Netă (VAN), Profitabilitatea (PI) și Rata Internă de Rentabilitate (RIR) sunt cercetați prin simulare informatică. În acest scop este definit un model de analiză comparativă a proiectelor de investiții de aceeași durată și este alcătuită aplicația informatică SIMINV. Folosind SIMINV, este determinat procentajul cazurilor, în care soluțiile, obținute folosind indicii fiecăreia dintre perechile {NPV, PI}, {NPV, IRR} și {PI, IRR} sau cei ai tripletului {NPV, PI, IRR}, diferă pentru șapte grupuri de alternative de date inițiale. Pe baza calculelor efectuate au fost identificate unele proprietăți ale indicilor, inclusiv: caracteristicile cantitative și caracterul unor dependențe de datele inițiale; procentajul mediu al cazurilor cu soluții diferite, care este de cca. 9 % pentru perechea de indici PI și IRR și de 34-35 % pentru celelalte două perechi de indici specificați mai sus. În

medie, soluțiile de comparare a eficienței proiectelor de aceeași durată, obținute folosind indicii VAN, PI și RIR, nu coincid în peste 1/3 din cazuri.

Cuvinte cheie: *analiză comparativă, simulare informatică, rata internă de rentabilitate, valoare actualizată netă, indice de profitabilitate.*

1. Introduction

As is well known, offered advantages impose the computerization of diverse activities implying respective investments. A decision of investment in an IT project is usually made on the basis of efficiency criteria/indices.

In economic analysis of IT projects (i-projects), the reasonable choice of indices to estimate the solution alternatives is of prime importance. For the assessment of economic efficiency of investment projects, such indicators are recommended as: profit, profit rate [1-3], payback period on investment, net present value [1, 4-6], profitability index [1, 5, 7], internal rate of return [1, 2, 7], return on investment [1, 8], economic return on investments [3, 8], adjusted expenditure [8], total costs of ownership [9] and so on.

Depending on project product and its field of use, the set of applied indices may differ. In a specific project, a small set of indices is usually applied. It is recommended to analyze 7 ± 2 indices [7]. Typically, 1-3 core indices and a few auxiliary indices are used. According to [4], the NPV, IRR, and discounted payback period (DPP) indices are most often recommended to be used. Along with the NPV, PI, IRR, and DPP ones, in [10] the Finite Value of the project and Modified Internal Rate of Return indices are explored; for a concrete project, using all these five indices leads to the same decision – it is appropriate to invest. But, of course, there may be many cases where the results differ. How often such situations occur? Known theoretical results do not give an unambiguous answer to this question. At the same time, to identify them computer simulation can be used.

Monte-Carlo method is largely used to assess financial risks in investment projects. For example, risk assessment for environmental projects using this method is provided in [11]. To select a project for the research, characteristics of 63 projects in the field were analyzed. By computer simulation it was determined the cumulated probability that the project value and execution period will be higher than the initially estimated values. A Monte-Carlo approach to assess financial risk in investment projects is used also in [12]. As a result, a new contribution to the field is made: the proposed risk scale offers five classifications regarding the degree of loss. In [13], a multiple criteria procedure based on stochastic dominance and PROMETEE II methodology is proposed. The first step of this procedure is computer simulation and the uncertainty of processes is taken into account by special stochastic dominance rule. There are many other aspects regarding the selection of investment projects which are explored by computer simulation.

In order to extend the theoretical results regarding the estimation of efficiency of investment in i-projects with equal lives, in this paper the net present value, profitability and internal rate of return indices are researched comparatively by computer simulation mainly to identify the frequency of non-coincidence of the obtained solutions.

2. Materials, Methodology and Methods

The comparative analysis of 16 indices of economic efficiency of investment in i-projects, performed in [14, 15] and based on correlation between indices, the specificity of the time value of money, the different duration of projects and also the range and importance

of the characterized aspects, show that as basic indices, for projects the revenues from the implementation of which can be estimated with reasonable efforts, it is opportune to use three: NPV, IRR and PI, eventually in conjunction with the equivalent annual value method. The last method allows the appropriate comparison of projects with different lifetimes that is not the case of this paper.

Below, **the approach** defined in [16] is followed, but with adaptations for projects of equal lives. Let I are investments and CF_t are cash flows in year t related to the project. Then NPV, IRR and PI indices are determined as [1, 7]:

$$NPV = \sum_{t=1}^D \frac{CF_t}{(1+d)^t} - I^C, \quad \sum_{t=1}^D \frac{CF_t}{(1+IRR)^t} - I^C = 0, \quad PI = 1 + \frac{NPV}{I^C} \quad (1)-(3)$$

where d is the discount rate.

These three indices form a Pareto set: no one of the three can always replace the use of one or two of the other indices, in sense of obtaining the same solutions when comparing projects. At the same time, there are particular cases when the use of all or two of the three indices for comparing two projects leads to the same solution. It is of interest how frequently such cases take place. To this and some other aspects, the answer can be obtained by computer simulation.

Let's compare two i-projects, 1 and 2, with equal lifetimes $D_1 = D_2 = D$ the revenues from the implementation of which can be estimated with reasonable efforts. When updating the values of indices, as time reference point will be used the time of projects launch in operation; this time is the same for both projects. It is required to identify, by computer simulation, the percentages of cases when the solutions, obtained using indices of each of the pairs {NPV, PI} (NP) – q_{NP} , {NPV, IRR} (NR) – q_{NR} , {PI, IRR} (PR) – q_{PR} and also of at least one of these three pairs – q_{NPR} , leads to different solutions. Obviously, the percentage of coincidence of all solutions when applying the three indices (NPV, PI and IRR) is equal to $100 - q_{NPR}$.

The discount rate d will be considered constant and equal for the two projects, but the values of CF_t and also those of I can be different for the two projects. They are also introduced two parameters, g and v . Parameter g value is determined for reasons of ensuring a given value r for the IRR index. So, from Eq.(2) at $CF_t = CF$, $t = 1, 2, \dots, D$, one has

$$\sum_{t=1}^D \frac{CF_t}{(1+r)^t} - I = CF \sum_{t=1}^D \frac{1}{(1+r)^t} - I = CF \frac{1 - (1+r)^{-D}}{r} - I = CF/g - I = 0,$$

that is

$$g = CF/I = r[1 - (1+r)^{-D}]. \quad (4)$$

Thus, g depends on r and D and, at the same time, it establishes the relation between the value I of investment and the average value CF of cash flows CF_t , $t = 1, 2, \dots, D$. Of course, at $CF_t \neq CF$, $t = 1, 2, \dots, D$ the IRR value isn't equal to r , but it is relatively close to it.

In its turn, parameter v characterizes the range of relative variation of CF_t with respect to CF . Therefore, the value of v is assigned according to the value $CF = gl$, namely

$$v = (CF - CF_{\min})/CF = (CF_{\max} - CF)/CF. \quad (5)$$

So,

$$CF_{\min} = CF(1 - v) = gl(1 - v), \quad (6)$$

$$CF_{\max} = CF(1 + v) = gl(1 + v) \quad (7)$$

and

$$CF_t \in [CF_{\min}; CF_{\max}], t = 1, 2, \dots, D. \quad (8)$$

In calculations, for parameters d , r , v , D and l will be used values from the ranges argued and used in [16], namely: $d \in [0.05; 0.14]$, $r \in [0.1; 0.9]$, $v \in [0.1; 0.5]$, $D \in [1; 10]$ and $l \in [100; 1000]$. Using these ranges of values, a very large number of alternatives of initial data can be formed. From these, as in [16], seven groups of alternatives, a1-a7, are selected. In all of them, the CF_t values are generated randomly at uniform repartition in the respective range as follows (taking into account Eq.(6)-Eq.(8)):

$$CF_{1t} \in [CF_{1\min}; CF_{1\max}], \text{ where } CF_{1\min} = g(1 - v)/l_1 \text{ and } CF_{1\max} = g(1 + v)/l_1;$$

$$CF_{2t} \in [CF_{2\min}; CF_{2\max}], \text{ where } CF_{2\min} = g(1 - v)/l_2 \text{ and } CF_{2\max} = g(1 + v)/l_2.$$

In alternative a6, the values of l and D are also generated randomly at uniform repartition in the respective range: $l_1 \in [100; 1000]$, $l_2 \in [100; 1000]$ and $D_1 = D_2 \in [1; 10]$. Additionally, in alternative a7 the values of r and v are generated randomly in the respective range: $r \in [0.1; 0.9]$ and $v \in [0.1; 0.9]$. At the same time, any such generated set of initial data is accepted only if $NPV_1 > 0$, $NPV_2 > 0$ and $|IRR_1 - IRR_2| \geq \varepsilon$. The reason of using the parameter ε ($\varepsilon = 0.005$) is to take into account the error of calculations when determining the IRR_1 and IRR_2 values.

Thus the seven groups of alternatives are:

- a1) the reference group (dependence on d): $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = 5$; $l_1 = 1000$, $l_2 = 500$; $r = 0.2$; $v = 0.5$;
- a2) dependence on D : $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = \{1, 2, 3, \dots, 10\}$; $l_1 = 1000$, $l_2 = 500$; $r = 0.2$; $v = 0.5$;
- a3) dependence on l_2 : $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = 5$; $l_1 = 1000$, $l_2 = \{100, 200, 300, \dots, 900, 1000\}$; $r = 0.2$; $v = 0.5$;
- a4) dependence on r : $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = 5$; $l_1 = 1000$, $l_2 = 500$; $r = \{0.1, 0.2, 0.3, \dots, 0.9\}$; $v = 0.5$;
- a5) dependence on v : $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = 5$; $l_1 = 1000$, $l_2 = 500$; $r = 0.2$; $v = \{0.1, 0.2, 0.3, \dots, 0.9\}$;
- a6) dependence on d + (on d when D_2 and l_2 are generated randomly – partial general group): $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 \in [1; 10]$; $l_1 \in [100; 1000]$, $l_2 \in [100; 1000]$; $r = 0.2$; $v = 0.5$;
- a7) dependence on d · (the general group): $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 \in [1; 10]$; $l_1 \in [100; 1000]$, $l_2 \in [100; 1000]$; $r \in [0.1; 1.0]$; $v \in [0.1; 0.9]$.

For each of the seven alternatives, the respective percentages q_{NP} , q_{NR} , q_{PR} , q_{NPR} and f have to be determined. Here f is the dependence on respective parameter (parameters) of the percentage of generated sets of initial data for which at least one of the following requirements take place: $NPV_1 < 0$, $NPV_2 < 0$ or $|IRR_1 - IRR_2| > \varepsilon$ (percentage of failure cases).

The algorithm, for the determination of percentages $q_{NP}(d)$, $q_{NR}(d)$, $q_{PR}(d)$, $q_{NPR}(d)$ and $f(d)$ in general case – group a7, is the following.

1. Initial data: $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 \in [D_{\min}; D_{\max}]$; $I_1 \in [I_{\min}; I_{\max}]$, $I_2 \in [I_{\min}; I_{\max}]$; $r \in [r_{\min}; r_{\max}]$; $v \in [v_{\min}; v_{\max}]$, N (total number of values for d), K (total number of initial data values for the done value of d - sample size). $n := 1$, $d := d_0$.
2. $m_f := 0$, $m_{NP} := 0$, $m_{NR} := 0$, $m_{PR} := 0$, $m_{NPR} := 0$ and $k := 1$.
3. Generation, at uniform random distribution, of the values of quantities $D_1 = D_2 = D \in [D_{\min}; D_{\max}]$; $I_1 \in [I_{\min}; I_{\max}]$, $I_2 \in [I_{\min}; I_{\max}]$ and $g := r/[1 - (1 + r)^{-D}]$.
4. $CF_{1\min} := g(1 - v)I_1$, $CF_{1\max} := g(1 + v)I_1$, $CF_{2\min} := g(1 - v)I_2$, $CF_{2\max} := g(1 + v)I_2$ and generation, at uniform random distribution, of the values of quantities $CF_{1t} \in [CF_{1\min}; CF_{1\max}]$, $t = 1, 2, \dots, D$ and $CF_{2t} \in [CF_{2\min}; CF_{2\max}]$, $t = 1, 2, \dots, D$.
5. Determination of NPV_1 according to Eq.(1). If $NPV_1 < 0$, then $m_f := m_f + 1$ and go to Step 10.
6. Determination of NPV_2 according to Eq.(1). If $NPV_2 < 0$, then $m_f := m_f + 1$ and go to Step 10.
7. Determination of IRR_1 and IRR_2 taking into account the Eq.(2). If $|IRR_1 - IRR_2| \leq \epsilon$, then $m_f := m_f + 1$ and go to Step 10.
8. Determination of PI_1 and PI_2 according to Eq.(3).
9. Identification and counting the numbers m_{NP} , m_{NR} , m_{PR} and m_{NPR} of cases when the solutions, obtained using indices of each of the pairs NP, NR and PR, and, respectively, at least of one of these pairs, leads to different solutions.
10. If $k < K$, then $k := k + 1$ and go to Step 3.
11. $q_{NP}(d) := 100m_{NP}/(K - m_f)$, $q_{NR}(d) := 100m_{NR}/(K - m_f)$, $q_{PR}(d) := 100m_{PR}/(K - m_f)$, $q_{NPR}(d) := 100m_{NPR}/(K - m_f)$ and $f(d) := 100m_f/K$.
12. If $n < N$, then $d := d + \Delta d$ and go to Step 2.
13. Taking over the simulation results. Stop.

Similar, with respective adaptations, are the algorithms for the groups of alternatives a1-a6. To implement the seven algorithms, the computer application SIMINV in C++ was made up.

3. Results and Discussion

To achieve the goal defined in Section 1, respective calculations were performed using the computer application SIMINV. Some of the obtained results are systemized in this section. Each set of initial data characterizes two concrete projects, 1 and 2. According to the algorithm and the seven groups of alternatives described in Section 2, a sample of 100000 was generated. So, were generated for the group of alternatives:

- a1, a6 and a7 by $10 \times 10^5 = 1$ mil sets of initial data;
- a2 and a3 by $10 \times 10 \times 10^5 = 10$ mil sets of initial data;
- a4 and a5 by $10 \times 9 \times 10^5 = 9$ mil sets of initial data.

3.1. The number of initial data generation failures

The approach, used to establish and generate initial data sets, doesn't ensure the requirements of $NPV_1 > 0$ and $NPV_2 > 0$. Also there exists an error when calculating the IRR_1 and IRR_2 values using the dichotomy method within the algorithm described in Section 2. That is why the algorithm counters the total number of cases of failure m_f (if takes place at least one of the inequalities: $NPV_1 < 0$, $NPV_2 < 0$ or $|IRR_1 - IRR_2| > \epsilon$). This number is used when calculating the values of percentages $q_{NP}(\cdot)$, $q_{NR}(\cdot)$, $q_{PR}(\cdot)$, $q_{NPR}(\cdot)$ and $f(\cdot)$. If this number is too large, then the calculation errors of obtained percentages are also significant. Therefore it is important to know its value.

In Figure 1, the dependences of f on d for the groups of alternatives of initial data a1, a6 and a7 are shown. The character of these dependencies is largely similar to those for the case of unequal lives described in [16], however the absolute value is higher, but not exceeding 48.2 %.

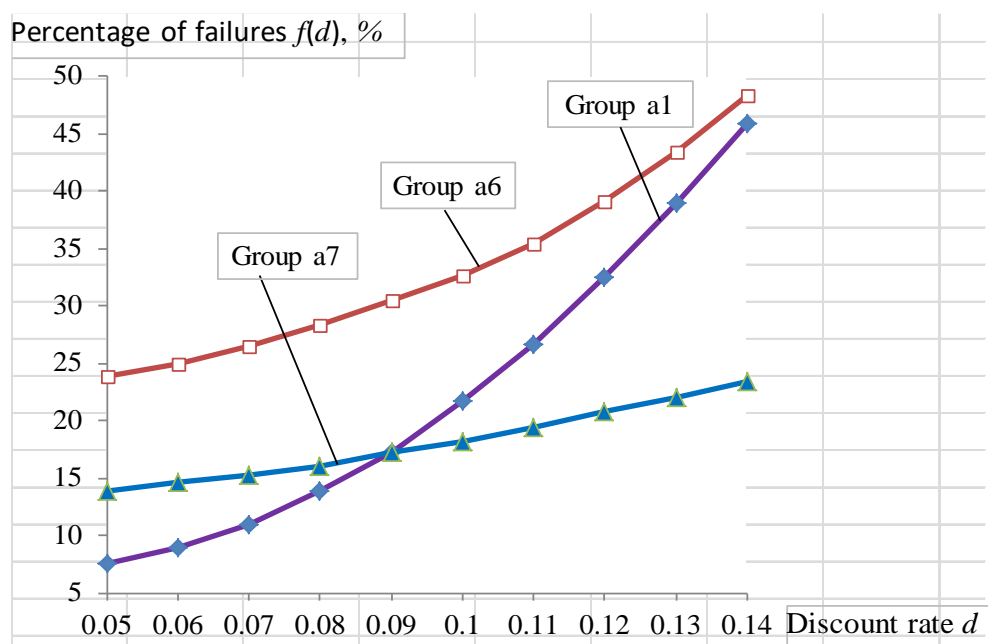


Figure 1. Percentages of failures when generating the sets of initial data.

The results of performed calculations show also that for the group of alternatives of initial data:

- a2 the dependence $f(d, D)$ is increasing on d , but is decreasing on D , the range of values being [7.4; 69.3] % at $d = 0.08$ and overall [6.0; 74.3] %;
- a3 the dependence $f(d, l_2)$ is increasing on d and is very little dependent on l_2 , the range of values being [13.5; 14.0] % at $d = 0.08$ and overall [7.3; 46.1] %;
- a4 the dependence $f(d, r)$ is increasing on d , but is decreasing on r , the range of values being [1.6; 71.9] % at $d = 0.08$ and overall [1.5; 97.7] %, but [1.5; 45.9] % at $r \geq 0.2$;
- a5 the dependence $f(d, v)$ is increasing on d ; with refer to v , it initially is decreasing and after is increasing, the range of values being [8.2; 40.1] % at $d = 0.08$ and overall [5.8; 63.6] %.

So, for all seven groups a1-a7 of alternatives of initial data the dependences $f(\cdot)$ are increasing on d , the overall range of values being of [1.5; 74.3] %, except the case of group a4 at $r = 0.1$ when the high limit is of 97.7%. Thus, in case of group a4 at $r = 0.1$, the sample of initial data is of $100000(100 - 97.7)/100 = 2300$ alternatives and usually is sufficient. In all other cases, the sample of initial data exceeds $100000(100 - 74.3)/100 = 25700$ alternatives and is good.

3.2. Frequency of cases for which the obtained solutions differ

Computer simulation using SIMINV was performed for all seven groups of alternatives defined in Section 2. Some results are described below.

The group of alternatives a1 - dependence on d . Initial data: $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = 5$; $l_1 = 1000$, $l_2 = 500$; $r = 0.2$; $v = 0.5$. The obtained dependences $q_{NP}(d)$, $q_{NR}(d)$, $q_{PR}(d)$ and $q_{NPR}(d)$ are shown in Figure 2.

Figure 2 shows that all mentioned dependences are decreasing on d . At the same time, dependences $q_{NP}(d)$ and $q_{NR}(d)$ practically coincide, and dependence $q_{NPR}(d)$ is close to the first two. Also, one has: $q_{NPR}(d) > q_{NP}(d) \approx q_{NR}(d) \gg q_{PR}(d)$. The obtained ranges of values for the four dependences are specified in Table 1.

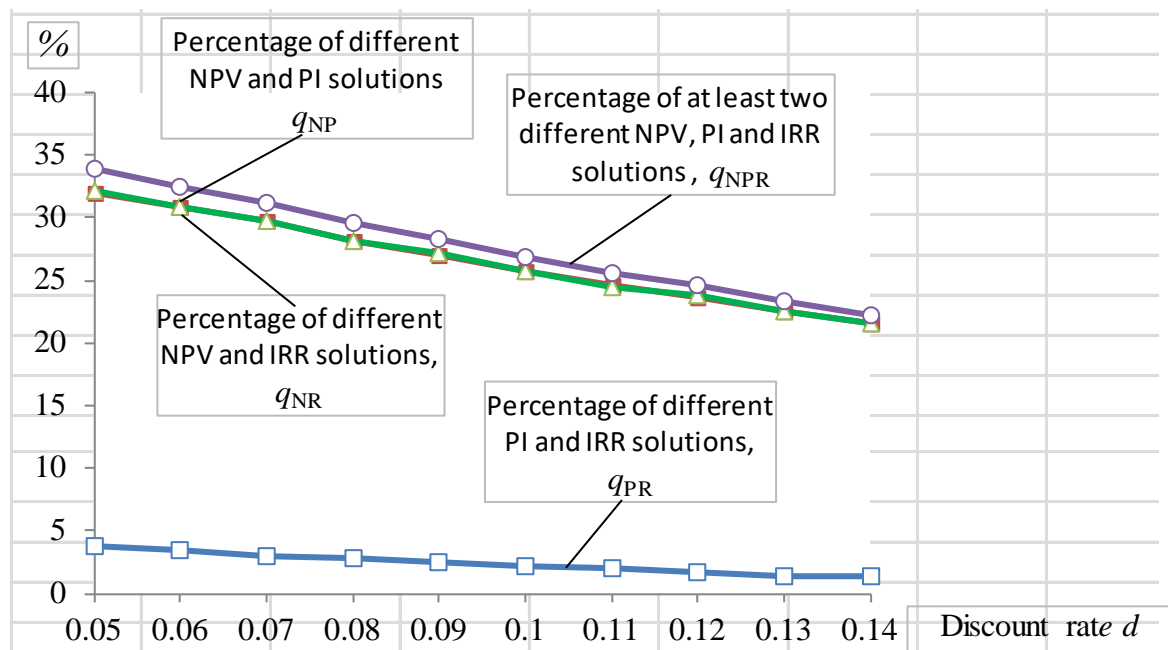


Figure 2. Percentages $q_{NP}(d)$, $q_{NR}(d)$, $q_{PR}(d)$ and $q_{NPR}(d)$.

Table 1

The ranges of values for the four dependences on discount rate $d \in [0.05; 0.14]$, %

Indicators	$q_{NP}(d)^1$	$q_{NR}(d)^2$	$q_{PR}(d)^3$	$q_{NPR}(d)^4$
Minimum of $q(d)$	21.6	21.6	1.30	22.2
Maximum of $q(d)$	32.1	32.1	3.84	34.0

¹ q_{NP} - percentage of different NPV and PI solutions; ² q_{NR} - percentage of different NPV and IRR solutions; ³ q_{PR} - percentage of different PI and IRR solutions; ⁴ q_{NPR} - percentage of at least two different NPV, PI, and IRR solutions.

Based on data of Table 1, it can be concluded that, on average, exists a considerable number of cases ($q_{NPR}(d) \in [22.2; 34.0]\%$) when the use of at least two of the three examined indices (NPV, PI and IRR) leads to different solutions. The use of pairs of compared indices NP and NR also can lead to different solutions in a significant number of cases the respective range of values being approx. the same and equal to $[21.6; 32.1]\%$. The narrowest range (the difference between the high and low limits) is that of $q_{PR}(d)$ equal to $3.84 - 1.30 = 2.54\%$. Also, because of the smallest values of percentages $q_{PR}(d) \in [1.30; 3.84]\%$, from the three compared indices, the PI and IRR are the closest to each other.

The group of alternatives a2 - dependence on D . Initial data: $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = D = \{1, 2, 3, \dots, 10\}$; $I_1 = 1000$, $I_2 = 500$; $r = 0.2$; $v = 0.5$. In graphical form, the dependences $q_{NP}(D)$, $q_{NR}(D)$, $q_{PR}(D)$ and $q_{NPR}(D)$ at $d = 0.08$ are presented in Figure 3. One can see that the character of the three dependences on D are different: that of $q_{PR}(D)$ is slowly increasing; those of $q_{NP}(D)$, $q_{NR}(D)$ and $q_{NPR}(D)$ are decreasing at $D \leq 2$ and are increasing at $D_2 > 2$. Also, as in Figure 2, dependences $q_{NP}(d)$, $q_{NR}(d)$ practically coincide, and dependence $q_{NPR}(d)$ is close to the first two. At the same time, one has: $q_{NPR}(d) > q_{NP}(d) \approx q_{NR}(d) \gg q_{PR}(d)$.

The obtained ranges of values for the four dependences are specified in Table 2.

Table 2

The ranges of values for the four dependences on lifetime D at disc. rate $d \in [0.05; 0.14]$, %

Indicators	$q_{NP}(D)^1$	$q_{NR}(D)^2$	$q_{PR}(D)^3$	$q_{NPR}(D)^4$
Minimum of $q(D)$	20.3	21.1	0	21.1
Maximum of $q(D)$	47.7	47.6	7.1	51.2

¹ q_{NP} - percentage of different NPV and PI solutions; ² q_{NR} - percentage of different NPV and IRR solutions; ³ q_{PR} - percentage of different PI and IRR solutions; ⁴ q_{NPR} - percentage of at least two different NPV, PI, and IRR solutions.

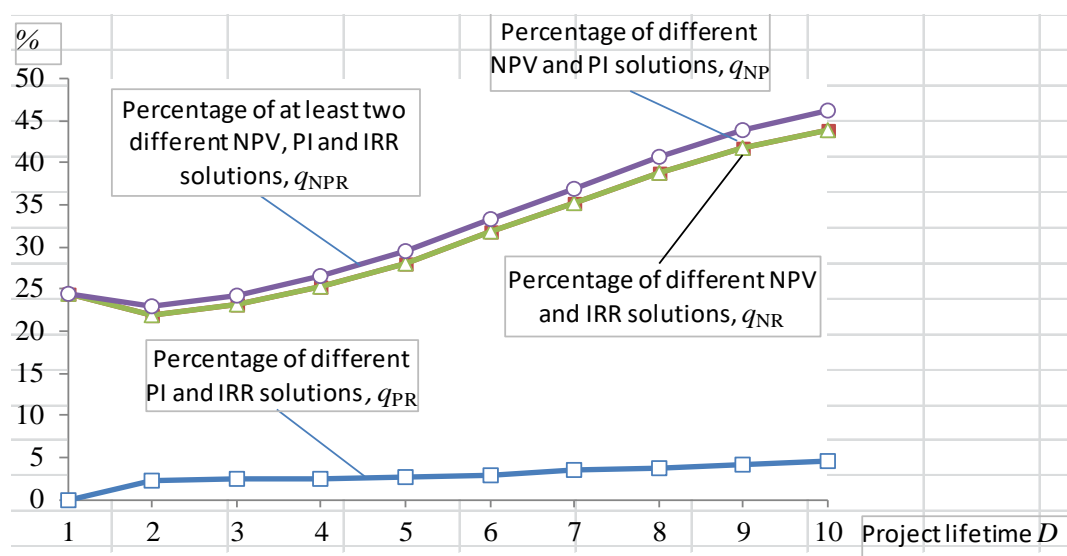


Figure 3. Percentages $q_{NP}(D)$, $q_{NR}(D)$, $q_{PR}(D)$ and $q_{NPR}(D)$.

It can be seen that there can be a large number of cases when the use of at least two of the three examined indices leads to different solutions ($q_{NPR}(D) \in [21.1; 51.2]\%$). The use of pairs of compared indices NP and NR also can lead to different solutions in a significant number of cases the respective range of values being approx. the same, but not exceeding 47.8%. The narrowest range is that of $q_{PR}(D)$ equal to 7.1 %. Also, because of the smallest values of percentage $q_{PR}(D) \in [0; 7.1]\%$, from the three compared indices, the PI and IRR are the closest to each other. At $D = 1$, the solutions obtained using these two indices coincide ($q_{PR}(D=1) = 0$) no matter of the $d \in [0.05; 0.14]$ value.

The group of alternatives a3 - dependence on l_2 . Initial data: $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = 5$; $l_1 = 1000$, $l_2 = \{100, 200, 300, \dots, 900, 1000\}$; $r = 0.2$; $v = 0.5$. Some results of calculations with refer to dependences $q_{NP}(l_2)$, $q_{NR}(l_2)$, $q_{PR}(l_2)$ and $q_{NPR}(l_2)$ at $d = 0.08$ are shown in Figure 4.

From Figure 4 one can see that percentages $q_{PR}(l_2)$ practically does not depend on l_2 , while the other three dependences are decreasing on l_2 , being very close to each other. Moreover, the dependences $q_{NP}(l_2)$ and $q_{NR}(l_2)$ practically coincide, except the case of $l_1 = l_2 = 1000$, when $q_{NP}(l_2) = 0$ no matter of the $d \in [0.05; 0.14]$ value. So, at $l_1 = l_2 = 1000$, the solutions obtained using the NPV and PI indices coincide no matter of the $d \in [0.05; 0.14]$ value. This fact is obvious if to take into account Eq.(1) and Eq.(3). The obtained ranges of values for the four dependences at $d \in [0.05; 0.14]$ are systemized in Table 3.

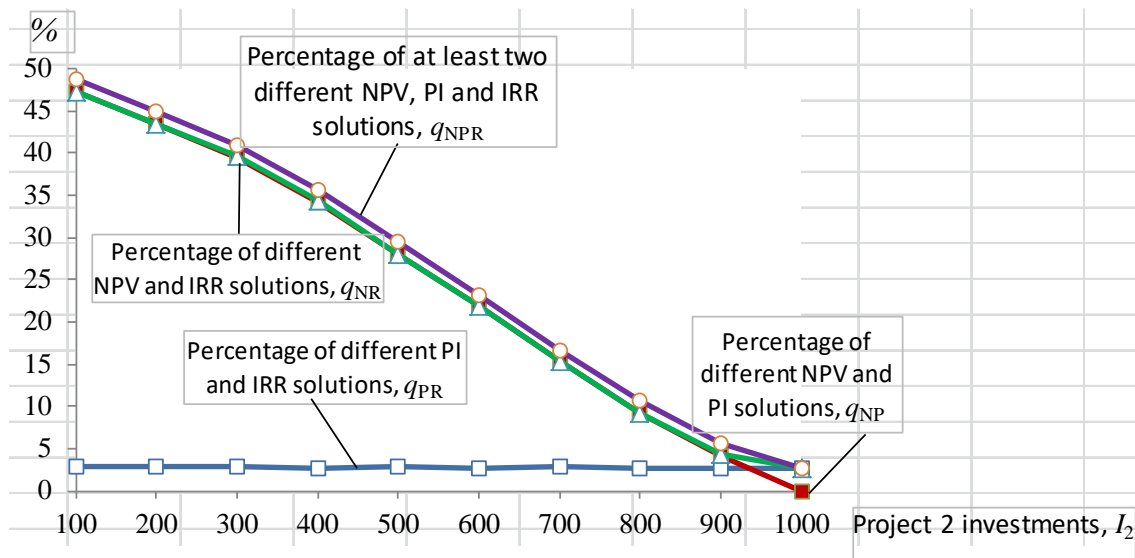


Figure 4. Percentages $q_{NP}(I_2)$, $q_{NR}(I_2)$, $q_{PR}(I_2)$ and $q_{NPR}(I_2)$.

Table 3

The ranges of values for the four dependences on investments I_2 at rate $d \in [0.05; 0.14]$, %

Indicators	$q_{NP}(I_2)^1$	$q_{NR}(I_2)^2$	$q_{PR}(I_2)^3$	$q_{NPR}(I_2)^4$
Minimum of $q(I_2)$	0	1.3	1.2	1.3
Maximum of $q(I_2)$	48.3	48.3	3.9	50.3

¹ q_{NP} - percentage of different NPV and PI solutions; ² q_{NR} - percentage of different NPV and IRR solutions; ³ q_{PR} - percentage of different PI and IRR solutions; ⁴ q_{NPR} - percentage of at least two different NPV, PI, and IRR solutions.

As in previous two groups of alternatives, there can be a considerable number of cases when the use of at least two of the three examined indices leads to different solutions ($q_{NPR}(d) \in [1.3; 50.3]$ %). The use indices NP and NR also can lead to different solutions in a significant number of cases, but not exceeding 48.3 %. At the same time, at $I_1 = I_2 = 1000$ the solutions obtained when using indices NP and NR coincide ($q_{NP}(I_2) = 0$) no matter of the $d \in [0.05; 0.14]$ value. The narrowest range is that of $q_{PR}(I_2)$ equal to $3.9 - 1.2 = 2.7$ %. Also, because of the smallest values of percentage $q_{PR}(d) \in [1.2; 3.9]$ %, from the three compared indices, the PI and IRR are usually the closest to each other.

The group of alternatives a4 - dependence on r . Initial data: $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = 5$; $I_1 = 1000$, $I_2 = 500$; $r = \{0.1, 0.2, 0.3, \dots, 0.9\}$; $v = 0.5$. The obtained dependences $q_{NP}(r)$, $q_{NR}(r)$, $q_{PR}(r)$ and $q_{NPR}(r)$ at $d = 0.08$ are shown in Figure 5.

One can see that all four examined dependencies are increasing on r and those of $q_{NP}(r)$ and $q_{NR}(r)$ practically coinciding with each other ($q_{NP}(r) \approx q_{NR}(r)$). It is also increasing on r the discrepancy between $q_{NP}(r) \approx q_{NR}(r)$ and $q_{NPR}(r)$. Compared to the previous three groups of alternatives, the increase on r of $q_{PR}(r)$ is stronger. At the same time, take place $q_{NR}(r) < q_{NP}(r) \approx q_{NPR}(r)$ and $q_{PR}(r) = 0$ at $\{r = 0.1, d = 0.14\}$. The obtained ranges of values, for the four dependences at $d \in [0.05; 0.14]$, are systemized in Table 4.

As in previous three groups of alternatives, there can be a considerable number of cases when the use of any two of the three examined indices leads to different solutions. The largest range of values is that of $q_{NPR}(d)$ equal to $58.7 - 13.4 = 45.3$ %, and the narrowest one is that of $q_{PR}(d)$ equal to 19.1 %. Also, because of the smallest values of percentages $q_{PR}(d) \in [0; 19.1]$ %, from the three compared indices the PI and IRR are the closest to each other.

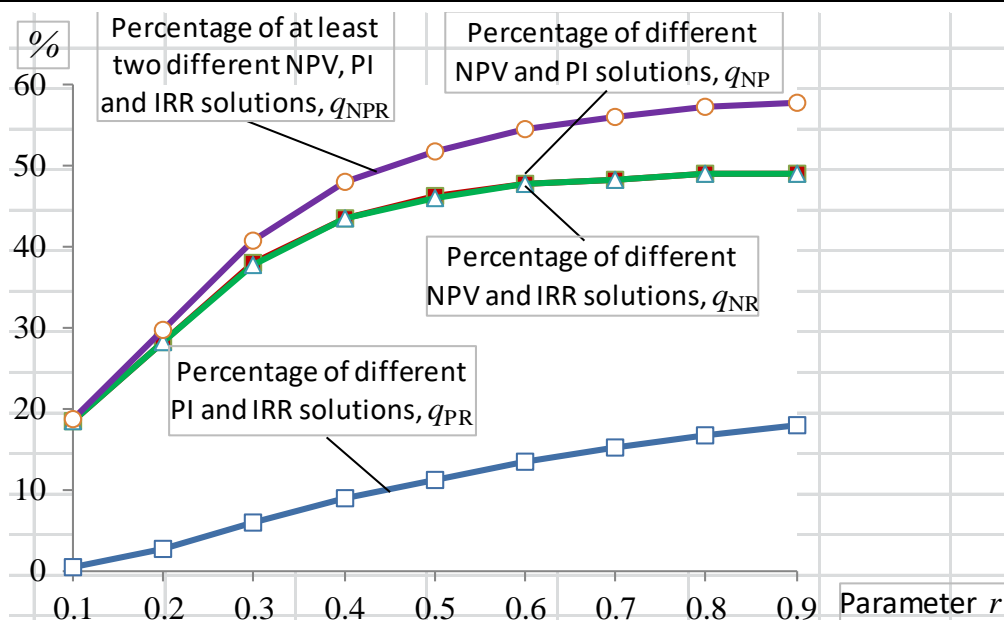


Figure 5. Percentages $q_{NP}(r)$, $q_{NR}(r)$, $q_{PR}(r)$ and $q_{NPR}(r)$.

Table 4

The ranges of values for the four dependences on parameter r at disc. rate $d \in [0.05; 0.14]$, %

Indicators	$q_{NP}(r)^1$	$q_{NR}(r)^2$	$q_{PR}(r)^3$	$q_{NPR}(r)^4$
Minimum of $q(r)$	13.4	13.4	0	13.4
Maximum of $q(r)$	49.2	49.4	19.1	58.7

¹ q_{NP} - percentage of different NPV and PI solutions; ² q_{NR} - percentage of different NPV and IRR solutions; ³ q_{PR} - percentage of different PI and IRR solutions; ⁴ q_{NPR} - percentage of at least two different NPV, PI, and IRR solutions.

The group of alternatives a5 - dependence on v . Initial data: $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 = 5$; $I_1 = 1000$, $I_2 = 500$; $r = 0.2$; $v = \{0.1, 0.2, 0.3, \dots, 0.9\}$. The obtained dependences $q_{NP}(v)$, $q_{NR}(v)$, $q_{PR}(v)$ and q_{NPR} at $d = 0.08$ are shown in Figure 6.

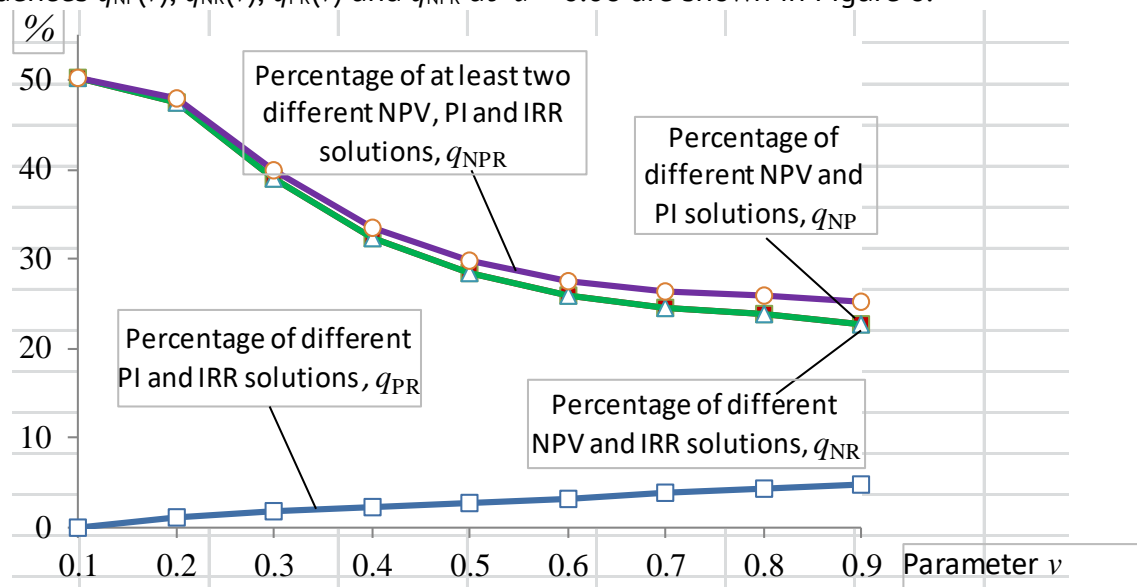


Figure 6. Percentages $q_{NP}(v)$, $q_{NR}(v)$, $q_{PR}(v)$ and $q_{NPR}(v)$.

According to Figure 6, three of the four dependences, namely $q_{NP}(v)$, $q_{NR}(v)$ and $q_{NPR}(v)$, are decreasing, and the $q_{PR}(v)$ one is slightly increasing on v . At the same time, at $v \in [0.1$;

0.2] take place $q_{NP}(v) \approx q_{NR}(v) \approx q_{NPR}(v)$, and at $v > 0.1$ the discrepancy between $q_{NP}(v) \approx q_{NR}(v)$ and $q_{NPR}(v)$ is slightly increasing, but is relatively small. The obtained ranges of values for the four dependences on v at $d \in [0.05; 0.14]$ are specified in Table 5.

Table 5

The ranges of values for four dependences on parameter v at disc. rate $d \in [0.05; 0.14]$, %				
Indicators	$q_{NP}(v)^1$	$q_{NR}(v)^2$	$q_{PR}(v)^3$	$q_{NPR}(v)^4$
Minimum of $q(v)$	20.6	20.2	0	21.7
Maximum of $q(v)$	50.01	50.03	5.6	50.4

¹ q_{NP} - percentage of different NPV and PI solutions; ² q_{NR} - percentage of different NPV and IRR solutions; ³ q_{PR} - percentage of different PI and IRR solutions; ⁴ q_{NPR} - percentage of at least two different NPV, PI, and IRR solutions.

Based on data of Table 5, it can be concluded that, on average, there are a considerable number of cases when the use of at least two of the three examined indices leads to different solutions ($q_{NPR}(v) \in [21.7; 50.4]\%$). The use of pairs of compared indices NP and NR also can lead to different solutions in a significant number of cases the respective range of values being approx. the same, but not exceeding 50 %. The narrowest range of values is that of $q_{PR}(v)$ equal to 5.56 %, and $q_{PR}(v) = 0$ at $\{v = 0.1, d \in [0.12, 0.14]\}$. Also, because of the smallest values of the percentage $q_{PR}(v) \in [0; 5.6]\%$, from the three compared indices, the PI and IRR are the closest to each other.

The group of alternatives a6 - dependence on $d+$ (on d when $D_1 = D_2$, l_1 and l_2 are generated randomly). Initial data: $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 \in [1; 10]$; $l_1 \in [100; 1000]$, $l_2 \in [100; 1000]$; $r = 0.2$; $v = 0.5$. The dependences $q_{NP}(d+)$, $q_{NR}(d+)$, $q_{PR}(d+)$ and $q_{NPR}(d+)$ are shown in Figure 7.

Similar to the group of alternatives a1 (dependence on d), for group a6 all four dependences are decreasing on d , and the ones for the pairs $q_{NP}(d+)$ and $q_{NR}(d+)$ practically coinciding. At the same time, the discrepancy between percentages $q_{NP}(d+) \approx q_{NR}(d+)$ and $q_{NPR}(d+)$ is slightly decreasing on d . Also, take place the relations $q_{PR}(d+) < q_{NP}(d+) \approx q_{NR}(d+) < q_{NPR}(d+)$. The obtained ranges of values for the four dependences at $d \in [0.05; 0.14]$ are specified in Table 6.

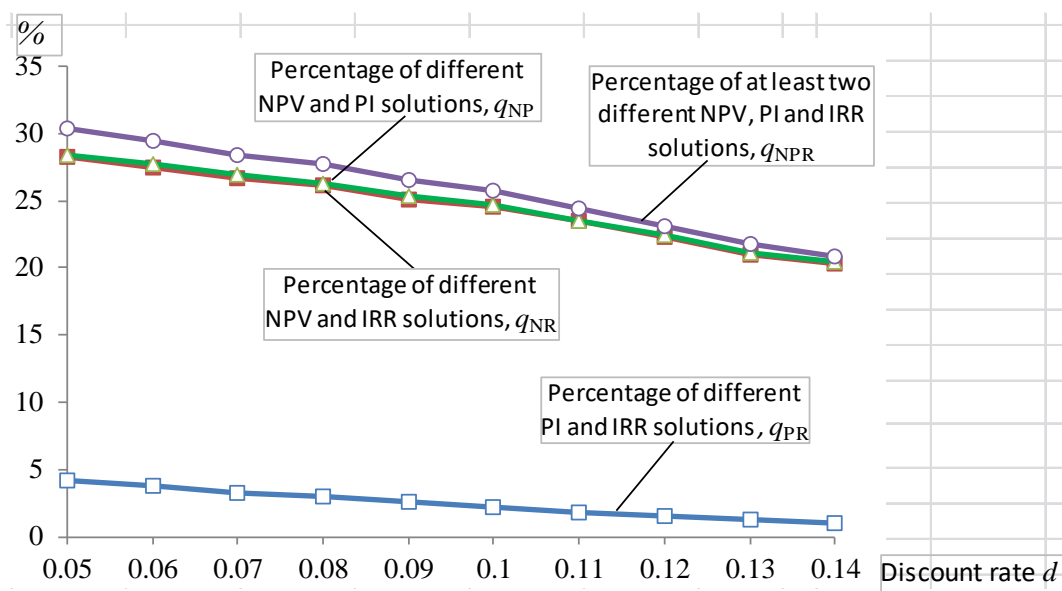
Figure 7. Percentages $q_{NP}(d+)$, $q_{NR}(d+)$, $q_{PR}(d+)$ and $q_{NPR}(d+)$.

Table 6

The ranges of values for the four dependences of case d^+ ⁵ at disc. rate $d \in [0.05; 0.14]$, %

Indicators	$q_{NP}(d^+)$	$q_{NR}(d^+)$	$q_{PR}(d^+)$	$q_{NPR}(d^+)$
Minimum of $q(d^+)$	20.3	20.4	1.1	20.9
Maximum of $q(d^+)$	28.2	28.4	4.2	30.4

¹ q_{NP} - percentage of different NPV and PI solutions; ² q_{NR} - percentage of different NPV and IRR solutions; ³ q_{PR} - percentage of different PI and IRR solutions; ⁴ q_{NPR} - percentage of at least two different NPV, PI, and IRR solutions; d^+ - case when $D_1 = D_2$, l_1 and l_2 are generated randomly.

On average, there are a significant number of cases when the use of investigated pairs of indices leads to different solutions; for example $q_{NPR}(d^+) \in [20.9; 30.4]$ %. The largest range of values is that of $q_{NPR}(d^+)$ equal to $30.4 - 20.9 = 9.5\%$, and the narrowest range is that of $q_{PR}(d^+)$ equal to $4.2 - 1.1 = 3.1\%$. From the three compared indices, the PI and IRR are the closest to each other: $q_{PR}(d^+) \in [1.1; 4.2]$ %.

The group of alternatives a7 – general group (on d when $D_1 = D_2$, l_1 , l_2 , r and v are generated randomly). Initial data: $d = \{0.05, 0.06, 0.07, \dots, 0.14\}$; $D_1 = D_2 \in [1; 10]$; $l_1 \in [100; 1000]$, $l_2 \in [100; 1000]$; $r \in [0.1; 0.9]$; $v \in [0.1; 0.9]$. Some of the obtained results of calculations for the four dependences at $d \in [0.05; 0.14]$ are systemized in Table 7.

On average, for the group of alternatives of initial data a7 the number of cases when the use of indices of researched pairs leads to different solutions is less than 35.7 %, and overall, that is when at least two of the three examined indices leads to different solutions is less than 40.7 %. The largest range of values is that of $q_{NPR}(d \cdot)$ equal to $40.7 - 37.9 = 2.8$ % ($q_{PR}(d \cdot) \in [37.9; 40.7]\%$), and the narrowest range is that of $q_{NP}(d \cdot)$ equal to $34.7 - 33.4 = 1.3$ %. As in previous six groups of alternatives, because of the smallest values of percentage $q_{PR}(d) \in [8.3; 11.0]\%$, from the three compared indices, the PI and IRR are the closest to each other.

Table 7

Percentages for the four dependences of case $d \cdot$ ⁵ at discount rate $d \in [0.05; 0.14]$, %

d	$q_{NP}(d \cdot)^1$	$q_{NR}(d \cdot)^2$	$q_{PR}(d \cdot)^3$	$q_{NPR}(d \cdot)^4$
0.05	34.68	35.74	10.95	40.69
0.06	34.68	35.56	10.55	40.40
0.07	34.51	35.38	10.09	39.99
0.08	34.51	35.28	9.85	39.82
0.09	34.17	35.09	9.47	39.36
0.1	34.02	34.68	9.33	39.01
0.11	34.03	34.85	9.31	39.10
0.12	33.54	34.15	8.89	38.29
0.13	33.40	34.28	8.65	38.19
0.14	33.41	34.03	8.32	37.88
Minimum of $q(d \cdot)$	33.40	34.03	8.32	37.88
Maximum of $q(d \cdot)$	34.68	35.74	10.95	40.69
Average of $q(d \cdot)$	34.09	34.91	9.54	39.27

¹ q_{NP} - percentage of different NPV and PI solutions; ² q_{NR} - percentage of different NPV and IRR solutions; ³ q_{PR} - percentage of different PI and IRR solutions; ⁴ q_{NPR} - percentage of at least two different NPV, PI and IRR solutions; $d \cdot$ - case when $D_1 = D_2$, l_1 , l_2 , r and v are generated randomly.

The obtained dependences $q_{NP}(d \cdot)$, $q_{NR}(d \cdot)$, $q_{PR}(d \cdot)$ and $q_{NPR}(d \cdot)$ are shown in Figure 8.

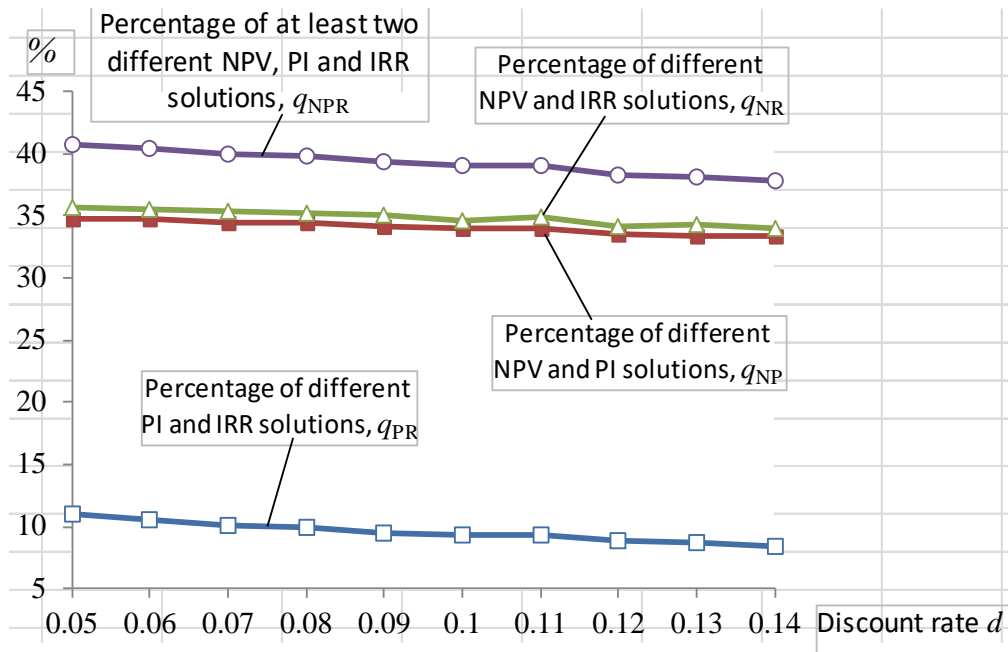


Figure 8. Percentages $q_{NP}(d)$, $q_{NR}(d)$, $q_{PR}(d)$ and $q_{NPR}(d)$.

Like the groups of alternatives a1 (dependence on d) and a6 (dependence on d^+), for the group a7 all four dependences are decreasing on d , but slightly than the $q_{PR}(v)$ for nominated two. At the same time, this is the only group of the seven examined for which clearly occurs $q_{NP}(d) < q_{NR}(d)$, and the discrepancy between $q_{NP}(d)$ and $q_{NPR}(d)$ as well as the one between $q_{NR}(d)$ and $q_{NPR}(d)$ are relatively large at $d \in [0.05; 0.14]$.

3.3. Generalization of the results of computer simulation

Figures 2-8 shows $4 \times 7 = 28$ dependences, of which 18 are decreasing, 6 are increasing, 3 initially are decreasing and after are increasing, and 1 is, practically, invariable. So, dependencies $q_{NP}(\cdot)$, $q_{NR}(\cdot)$, $q_{PR}(\cdot)$ and $q_{NPR}(\cdot)$ on d (Figure 2), on I_2 (Figure 4), on v (Figure 6), on d^+ (Figure 7) and on d^- (Figure 8) are decreasing or slightly decreasing, except that:

- $q_{PR}(I_2)$ is, practically, invariable (Figure 4);
- $q_{PR}(v)$ is slightly increasing (Figure 6).

Are increasing also dependences: $q_{PR}(D)$ (Figure 3); $q_{NP}(r)$, $q_{NR}(r)$, $q_{PR}(r)$ and $q_{NPR}(r)$ (Figure 5). At the same time, dependences $q_{NP}(D)$, $q_{NR}(D)$ and $q_{NPR}(D)$ are initially decreasing and after increasing (Figure 3).

By pairs, in groups a1-a6 of alternatives of initial data, the dependences $q_{NP}(\cdot)$ and $q_{NR}(\cdot)$ practically coincide, and in group a7 they are very close to each other. Relatively close to them is also the dependence $q_{NPR}(\cdot)$. With refer to percentages $q_{PR}(\cdot)$, usually these are considerable smaller than the $q_{NP}(\cdot)$, $q_{NR}(\cdot)$ and $q_{NPR}(\cdot)$ ones. Thus, from the NPV, PI and IRR indices, the last two are the closest to each other regarding the solutions of comparing the efficiency of projects obtained. A comparative analysis of the range of values for the four percentages can be done based on data of Table 8.

So, at used seven groups of alternatives of initial data, the average percentage of cases with different solutions for all three pairs of indices usually is considerable, namely: $q_{NP}(\cdot) \in [0; 50.01]$ %, $q_{NR}(\cdot) \in [1.26; 50.03]$ % and $q_{PR}(\cdot) \in [0; 19.11]$ %. Also, the average percentage $q_{NPR}(\cdot)$ of cases with different solutions, when using of at least two of the three examined indices (NPV, PI and IRR), is in the range of values $[1.26; 58.67]$ %. The overall size of the value range is approx.: 50 % for $q_{NP}(\cdot)$, 49 % for $q_{NR}(\cdot)$, 19 % for $q_{PR}(\cdot)$ and 57 % for $q_{NPR}(\cdot)$.

At the same time, there are categories of sets of initial data when examined indices in pairs always lead to the same solution, including the pairs:

Table 8

Characteristics of the range of values for the four dependencies, %

Indicators		$q_{NP}(\cdot)^1$	$q_{NR}(\cdot)^2$	$q_{PR}(\cdot)^3$	$q_{NPR}(\cdot)^4$
Minimum of	$q(d)^5$	21.60	21.60	1.30	22.20
	$q(D)^6$	20.32	21.05	0	21.14
	$q(l_2)^7$	0	1.26	1.24	1.26
	$q(r)^8$	13.36	13.36	0	13.36
	$q(v)^9$	20.58	20.20	0	21.71
	$q(d+)^{10}$	20.31	20.43	1.07	20.90
	$q(d\cdot)^{11}$	33.40	34.03	8.32	37.88
Overall minimum		0	1.26	0	1.26
Maximum of	$q(d)$	32.10	32.10	3.84	34.00
	$q(D)$	47.67	47.57	7.06	51.15
	$q(l_2)$	48.34	48.31	3.89	50.25
	$q(r)$	49.22	49.35	19.11	58.67
	$q(v)$	50.01	50.03	5.56	50.35
	$q(d+)$	28.22	28.40	4.16	30.39
	$q(d\cdot)$	34.68	35.74	10.95	40.69
Overall maximum		50.01	50.03	19.11	58.67
Overall range value		50.01	48.77	19.11	57.41

¹ q_{NP} - percentage of different NPV and PI solutions; ² q_{NR} - percentage of different NPV and IRR solutions; ³ q_{PR} - percentage of different PI and IRR solutions; ⁴ q_{NPR} - percentage of at least two different NPV, PI and IRR solutions; ⁵ d - discount rate; ⁶ D - projects lifetime; ⁷ I_2 - project 2 investments; r - parameter for IRR value; v - parameter for the variation of CF_t values; $d+$ - case when $D_1 = D_2$, I_1 and I_2 are generated randomly; $d\cdot$ - case when $D_1 = D_2$, I_1 , I_2 , r and v are generated randomly.

- {NPV, PI} for group a3 (dependence on I_2) at $I_1 = I_2 = 1000$, that is obvious;
- {PI, IRR} for group a2 (dependence on D) at $D = 1$, for group a4 (dependence on r) at $\{r = 0.1, d = 0.14\}$ and for group a5 (dependence on v) at $\{v = 0.1, d \in [0.12, 0.14]\}$.

But there were not identified such categories of sets of initial data when using the NPV and IRR indices or, as a result, all three examined indices (NPV, PI and IRR) together.

It is useful also to mention that, based on group a7 of alternatives of initial data (general group – dependence on d when $D_1 = D_2$, I_1 , I_2 , r and v values are generated randomly), the average percentage of cases with different solutions is approx. (in the increasing order): 9.1 % for $q_{PR}(\cdot)$, 34.1% for $q_{NP}(\cdot)$, 34.9 % for $q_{NR}(\cdot)$ and 39.3 % for $q_{NPR}(\cdot)$ (see Table 7). Thus, on average, the solutions of comparing the efficiency of projects obtained, when using the NPV, PI and IRR indices, does not coincide in more than 1/3 of cases.

4. Conclusions

To research comparatively by computer simulation the NPV, PI and IRR indices, used when selecting investment i -projects with equal lives, a model of comparative analysis of projects is defined and the SIMINV application is made up.

Each of the two compared projects is characterized by: discount rate d , duration D , volume of investment I and cash flows CF_t , $t = 1, 2, \dots, D$. From these characteristics, only the

values of d and D are common for both projects. The other characteristics in some cases have fixed value and in other cases are generated randomly, in such a way forming seven groups of alternatives of initial data.

By computer simulation, the percentages of cases when the solutions, obtained using indices of each of the pairs $\{NPV, PI\} - q_{NP}$, $\{NPV, IRR\} - q_{NR}$, $\{PI, IRR\} - q_{PR}$ or at least two of the NPV, PI and IRR indices – q_{NPR} , does not coincide is determined. These results complement, to some extent, the known theoretical ones in the domain.

So, for all seven groups of alternatives of initial data are determined the quantitative values and the character of dependencies $q_{NP}(\cdot)$, $q_{NR}(\cdot)$, $q_{PR}(\cdot)$ and $q_{NPR}(\cdot)$. There are categories of sets of initial data when examined indices in pairs always lead to the same solution. But there were not identified such categories of sets of initial data when using the NPV and IRR indices or, as a result, all three examined indices (NPV, PI and IRR) together.

The average percentage of cases, for which the obtained solutions does not coincide, is of approx. (in the increasing order): 9.1 % for $q_{PR}(\cdot)$, 34.1% for $q_{NP}(\cdot)$, 34.9 % for $q_{NR}(\cdot)$ and 39.3 % for $q_{NPR}(\cdot)$, being considerable. Thus, from the NPV, PI and IRR indices, the last two are the closest to each other regarding the solutions of comparing the efficiency of projects obtained. Also, on average, the solutions of comparing the efficiency of projects, obtained when using the NPV, PI and IRR indices, does not coincide in more than 1/3 of cases.

Conflicts of Interest. The authors declare no conflict of interest.

References

- Behrens, W.; Hawranek, P.M. *Manual for the Preparation of Industrial Feasibility Studies*. Ed. UNIDO, Vienna, 1991, 404 p.
- Marquetti, A.A.; Morrone, H.; Miebach, A.; Ourique, L.E. Measuring the Profit Rate in an Inflationary Context: The Case of Brazil, 1955–2008. In: *Review of Radical Political Economics* 2019, 51(1), pp. 52–74.
- Romanu, I.; Vasilescu, I. *Economic Efficiency of Investments and of Fixed Capital*. Ed. Didactic and Pedagogical Publishing House, Bucharest, 1993, 301 p. [in Romanian].
- Rodionova, E.A.; Shvetsova, O.A.; Epstein, M.Z. Multicriterial Approach to Investment Projects' Estimation under Risk Conditions. *Revista ESPACIOS* 2018, 39(8), pp. 17–28.
- Isaia, O.; Romashkob, O.; Semenov, A.; Sazonov, T.; Podike, I.; Hnatenko, I.; Rubezhanska, V. Methods of multi-criteria evaluation of economic efficiency of investment projects. *Journal of Project Management* 2021, 6(2), pp. 93–98.
- Bragg, S.M. *Business Ratios and Formulas: A Comprehensive Guide*. Ed. John Wiley & Sons, Inc., New Jersey, 2012, 355 p.
- Livchits, V.N. Systems Analysis of Investment Project Efficiency Evaluation. In: *Systems Analysis and Modeling of Integrated World Systems*. Ed. Eolss Publishers Co. Ltd., Oxford, United Kingdom, 2009, pp. 177–198.
- Albu, S.; Capsăzu, V.; Albu, I. *Efficiency of Investment*. Ed. CEP USM, Chisinau, 2005, 138 p. [in Romanian].
- Ellram, L.M. A Taxonomy of Total Cost of Ownership Models. *Journal of Business Logistics* 1994, 15(1), pp. 171–191.
- Sedláčiková, M. Evaluation of economic efficiency of the investment project through controlling's methods. *Annals of Warsaw University of Life Sciences* 2013, 84, pp. 153–158.
- Platon, V.; Constantinescu, A. Monte Carlo Method in risk analysis for investment projects. *Procedia Economics and Finance* 2014, 15, pp. 393 – 400.
- Harzer, J.H.; Souza, A.; Da Silva, W.V.; Cruz, J.A.W.; Da Veiga, C.P. Probabilistic Approach to the MARR/IRR Indicator to Assess Financial Risk in Investment Projects. *International Research Journal of Finance and Economics* 2016, 144, pp. 131–146.
- Nowak, M. Investment projects evaluation by simulation and multiplecriteria decision aiding procedure. *Journal of Civil Engineering and Management* 2005, 11(3), pp. 193–202.
- Bolun, I. On criteria to be used by mission of projects. *Economica* 2017, 102(4), pp. 135–148.
- Bolun, I. Aspects of selecting investment i-projects. In: *Competitiveness and innovation in the knowledge economy*. Ed. ASEM Publishing House, Chisinau, 2018, 5, pp. 7–12.
- Bolun, I., Ghetmancenco, S., Nastas, V. Efficiency indices of investment in IT projects with unequal lives. *SWorldJournal*, 2022, 12(1), pp. 16–34.

Citation: Bolun, I.; Ghetmancenco, S. Efficiency indices of investment in it projects with equal lives. *Journal of Social Sciences* 2022, 5 (3), pp. 105-120. [https://doi.org/10.52326/jss.utm.2022.5\(3\).08](https://doi.org/10.52326/jss.utm.2022.5(3).08).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).09](https://doi.org/10.52326/jss.utm.2022.5(3).09)
UDC 303.443+658.512.2(64)



THE COLLABORATIVE EVALUATION AND CO-DESIGN (CEC) APPROACH: PROSPECTS FOR EFFECTIVE SOLUTIONS-INNOVATIONS, EPISTEMOLOGICAL FOUNDATIONS AND IMPLEMENTATION PROCESS

Judicaël Alladatin*, ORCID: 0000-0001-7230-9953

Institute of Educational Sciences; Mohammed VI Polytechnic University, Hay Moulay, Benguerir, 43150, Morocco

*Corresponding author: Judicaël Alladatin, judicael.alladatin@um6p.ma

Received: 04. 28. 2022

Accepted: 06. 02. 2022

Abstract. One typical challenge of designing solutions is that they seem feasible in theory but are difficult to implement at scale and to make sustainable. To address this challenge, there is a growing call for the inclusion of every actor in the innovation process. Our study's hypothesis points to the collaborative evaluation and co-design (CEC) approach as the ideal way to the adoption of workable solutions. This methodological design paper aims to introduce the reader to the foundations and the use of this approach. Multiple tests of its effectiveness were conducted in different Moroccan school environments. Then a comparative analysis of the tests' results allowed a revision each time and led to the first finding; the development of the CEC approach based on the theoretical perspective of "meaning making" by actors. The second finding is the different steps of its use, namely the exploratory phase and the organization and conduct of workshops. The research identified key opportunities and recommendations for the successful implementation of the findings. Finally, this evolution of design research from a user-centered approach to co-design opens new areas of collective creativity as well as potentially more sustainable innovations in different fields.

Keywords: *corrective actions, meaning-making by the actors, methodological design, stakeholders, workshops.*

Rezumat. O provocare tipică a proiectării soluțiilor este că acestea par fezabile în teorie, dar sunt dificil de implementat la scară largă și de a le face durabile. Pentru a aborda această provocare, există un apel tot mai mare pentru includerea fiecărui actor în procesul de inovare. Ipoteza studiului indică abordarea de evaluare colaborativă și co-proiectare (CEC) ca modalitate ideală de adoptare a soluțiilor viabile. Această lucrare de proiectare metodologică își propune să introducă cititorul în bazele și utilizarea acestei abordări. Au fost efectuate mai multe teste ale eficacității în diferite medii școlare marocane. Apoi o analiză comparativă a rezultatelor testelor a permis o revizuirea și a condus la prima constatare: dezvoltarea abordării CEC bazată pe perspectiva teoretică a „crearea sensului” de către actori. A doua constatare implică diferite etape ale utilizării conceptului, și anume faza de explorare și desfășurarea atelierelor. Cercetarea a identificat oportunități și recomandări cheie pentru

implementarea cu succes a rezultatelor. În cele din urmă, această evoluție a cercetării designului de la o abordare centrată pe utilizator la co-design deschide noi domenii de creativitate colectivă, precum și inovații potențial mai sustenabile în diferite domenii.

Cuvinte cheie: *acțiuni corective, crearea de sens de către actori, proiectare metodologică, părți interesate, ateliere.*

1. Introduction

In the late 1990s, a shift started progressively in the process by which organizations, institutions, and companies created value [1]. With growing competition, for example, businesses were being forced to design products “with” their customers, not only “for” them, resulting in the participation of a selected number of customers (if not all) in the creation process [2]. That shift in the balance of influence between individuals and institutions was not unique to businesses. In government, open governance was beginning to be adopted. Education systems, for example, have seen the institutionalization of the participation and collaboration of parents and the wider school community in the management of education systems in most countries around the world [3]. The core idea was to bring together the expertise of system designers and researchers with that of people whose work would be affected by the service, product, or change [4].

The collaborative approach has been proven to improve the creative process, the service or result of a project, the management of projects as well as the longer-term effects, whether on a market or a community [5]. However, while this significant progress is being made, implementing a collaborative decision-making approach with the effective participation of all stakeholders remains challenging. Therefore, this paper aims to discuss a methodological approach to successfully implement collaborative evaluation and co-design of corrective actions. The methodological design described in this work is based on the author's experience and practices by means of workshops over the years. It has been developed, improved, and tested in the school environment, but could be used in other fields such as health, community, cooperatives, etc. We first present the theoretical framework before outlining the methodological approach. The methodological framework of this work involved empirical tests of the approach through its use in several contexts and on various issues namely related to education in Morocco. Along with the inclusion of all actors from numerous schools' educational communities, we were able to continuously make comparisons of the results of the tests and reveal patterns of the approach's implementation to improve its use and develop its implementation process. This process draws on the principles of open government and collaboration to conduct performance evaluations, assessments, as well as ideation and corrective action planning sessions by involving the various stakeholders in the concerned communities.

2. Theoretical Framework: an Epistemology of “Meaning Making” by the Actors

The foundation of a collaborative approach is that it occurs in groups of people with diverse backgrounds but with a common interest in resolving an issue. They interact using language, signs, and tools to express their ideas and reach or not a consensus. Each actor makes sense of what a certain aspect means to him depending on his previous knowledge and experience. And that's what we call “Meaning making” which “designates the process by which people interpret situations, events, objects, or discourses, in the light of their previous knowledge and experience” [6]. In this paper, we use five theories as shown in the figure

below, to approach and analyze the process of “Meaning making” by the actors on which the CEC approach developed in this work is based: Interactionist theory, Actor-network theory, activity theory; co-design theory and systemic theory.

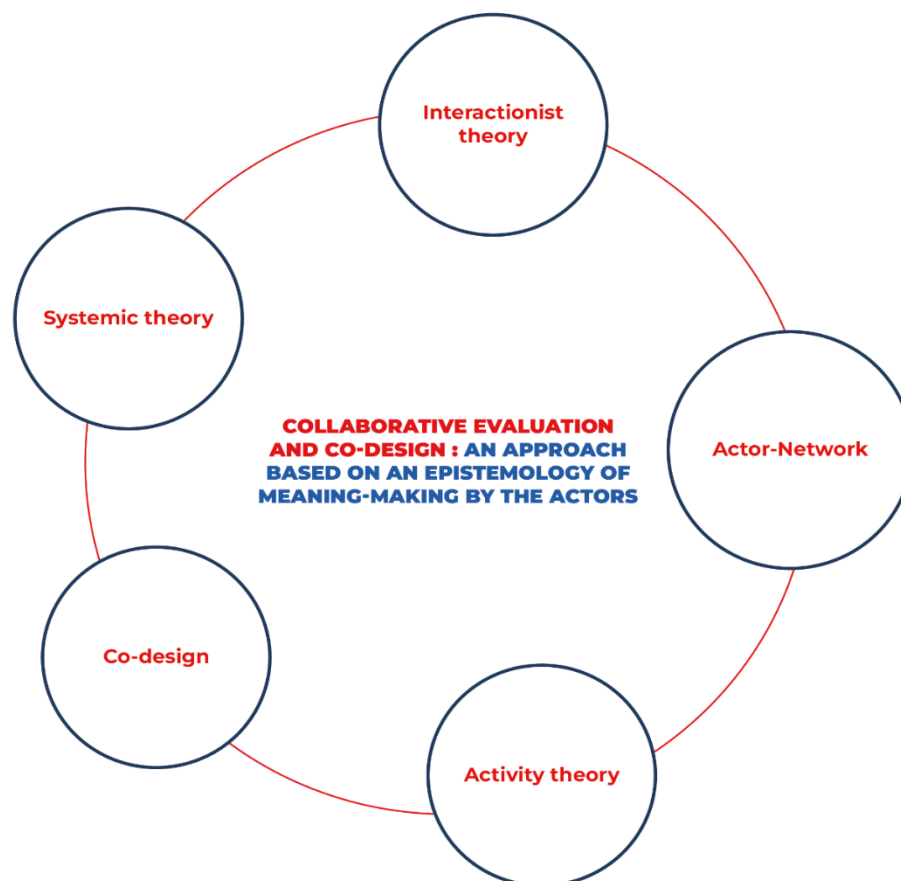


Figure 1. Overview of the theoretical framework of the epistemology of “meaning making” by the actors. the co-design process (right) [7-8].

2.1. Interactionist theory

Interactionist theory is predicated on the idea that human beings, through interaction with others, create meanings for themselves and others, and use those meanings to act in the world [9]. From this point on, symbolic interactionism focuses on describing this exchange of meaning through language and symbols.

Goffman, a leading figure in symbolic interactionism, went through several models before establishing his conception. He first used a dramaturgical model, then a game-theoretic model, an ethological model, and finally a conversational model [7]. He states that interactionism refers to the rigorous framework of micro-sociological analysis that advocates the empirical use of movement between actors and systems in the analysis of social facts [7,10]. This perspective is enhanced by the use of systems theory.

2.2. Systems theory

Systems Theory brings together the set of theoretical principles that explain the systemics[11]. The systemic theory is based on the logic of the system. Thanks to a holistic vision, it allows going beyond the limits of classical Cartesianism to approach complex subjects that were refractory to the latter. The system is defined according to each scientific field. However, it refers to an assembling of elements functioning in a unitary way and permanent interaction. Bertalanffy evokes the general theory of systems, during his research

where he explored various fields of application of the theory including psychology, and sociology with levels of organization [11,12]. To this end, he discusses general systems theory based on three levels of analysis including systems science, systems technology, and systems philosophy.

Groups of people interacting together to come up with a solution is a system. In fact, systems theory provides a way to explain the interactions between small group systems and the systems in which they are nested, such as the plenary sessions that constitute another system. This theory is especially valuable since our basic assumption for the value of collaborative work is that “the whole is greater than the sum of its parts” [13]; which is exactly the basic principle of systems theory.

2.3. Activity theory

Activity theory is a concept that stems from the work of Soviet theorists in the early 20th century [10]. These theories are coming back to the forefront with issues related to cognition, learning, and teaching [14]. The premise of this theory is that every activity is implemented by people with an intention in a community governed by rules, to achieve a goal, the purpose of the activity [15]. The added value of Activity theory is that it considers tools, signs, or other artefacts as well as rules of the community mediating the activity as actors without which the activity will not either exist at all or be significantly deviated from its objective, creating thereby another activity. The figure below is a representation of the structure of this interaction between all these actors to reach an action. Activity theory offers a conceptual framework from which one can understand “the inter-relationship between activities, actions, operations and artefacts, subjects’ motives and goals, and aspects of the social, organizational and societal contexts within which these activities are framed”.

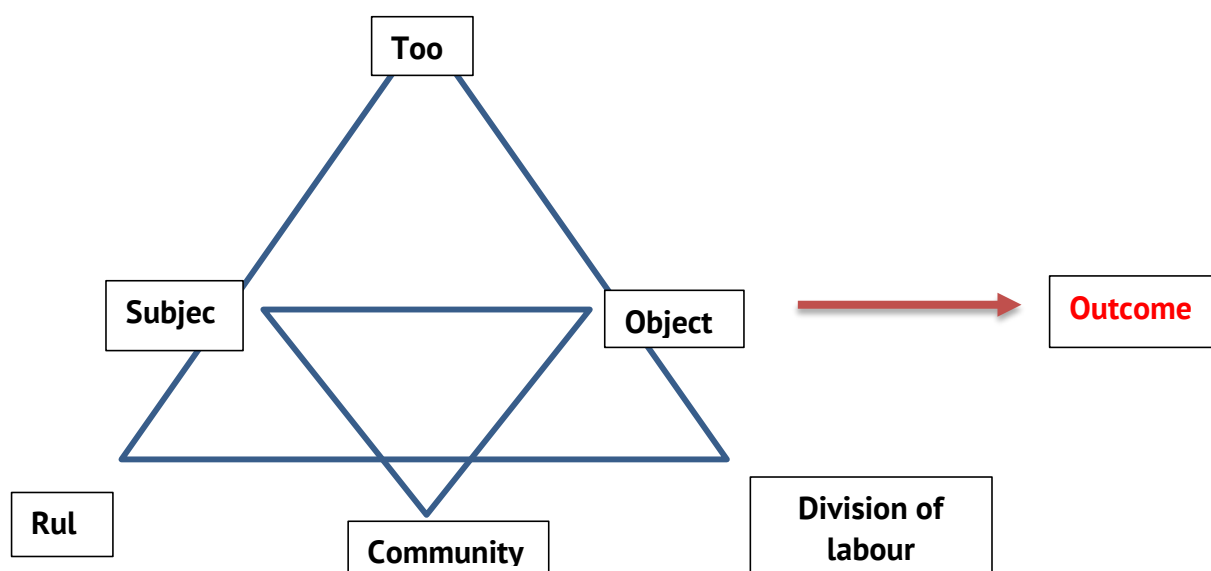


Figure 2. The structure of human activity [15].

2.4. Actor theory, actor-network theory

Actor theory was developed by Michel Crozier and Erhard Friedberg in the 1970s [16]. It is a central theory in the sociology of organizations, developed within a strategic analysis. The Actor-Network theory was developed during the 1980s by a group of sociologists [17], dealing with interactions not only between human beings but also with non-human “agents”.

Latour suggests that every agent in a network, whether human or not has the same importance, and constitutes itself a network; every element of a network has its agency [18]. The group of sociologists at the origin of this theory [17] asserts that the success or failure of a network lies in its capacity to link heterogeneous “actors”, by engaging them in structuring conflicts or controversies that are a good way to achieve social acceptability of innovation.

2.5. Co-design

Collaborative design is a new pedagogical approach. It is opposed to the old one which is critical and stressful. It is a more collaborative approach, less competitive, encouraging learners to help each other. In education, for example, it allows learners to learn to think aloud, without blocking or fear of rejection [19]. Researchers are calling for the integration of education and research actors in this innovation process for easy adoption of solutions [20,21]. Co-design has evolved into co-creation, which could lead to more sustainable solutions. Collaborative research focuses on contributing to both improved practice and theory building [22]. The figure below shows a shift from user-centered input design to co-design and how the merging of actors improves their role in the design process. This approach leads to a shared understanding of the user experience between users, researchers, and designers [2,23].

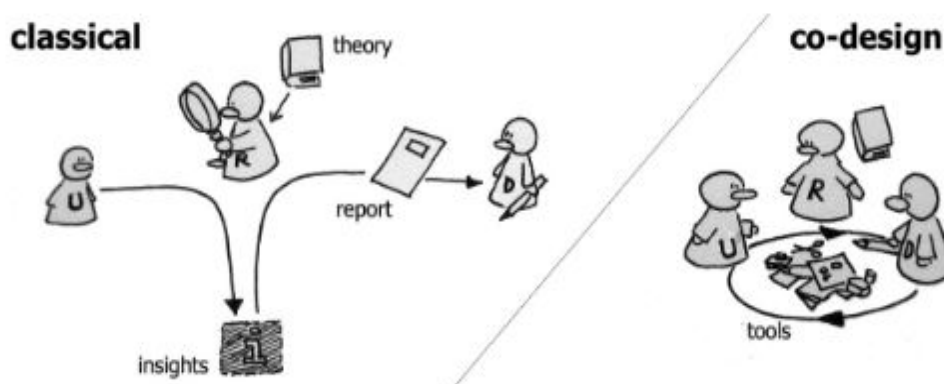


Figure 3. The classic roles of users, researchers, and designers in the design process (left) and their merging in the co-design process (right) [3].

3. The Collaborative Evaluation and Co-design Approach (CEC)

The collaborative approach is a proven approach that addresses all facets that a process involves. Applied to research, it focuses on the co-construction of knowledge with participants according to a collaboratively determined research objective [24]. A collaborative (or cooperative) learning approach involves people working together on activities or tasks in a group small enough to ensure that everyone is participating [25,26]. People in each group can work on separate tasks contributing to a common overall outcome or work together on a shared task. Eventually, working bringing all pieces of work together leads to co-design.

3.1. Exploratory phase and establishment of the resources and stakeholders' map

During the exploratory phase, it is crucial to learn about the general directives at the highest level of decision-making as well as actions underway in the specific sector targeted by the project. At the level of a country, this implies meetings with the key actors in the public to better understand and align one's actions to the national directives, the experiences in progress through the initiatives, and the actors concerned by the project.

At the local level depending on the coverage of the project, researchers can sample a number of study subjects randomly according to the proportion of each cluster. For example, when the study subjects are schools, a sample of schools may be constituted in consultation with representatives from the Ministry of National Education based on each school's monograph. After sampling, the exploratory work will consist of "casual" visits to the study's subjects in order to establish initial physical contact. These meetings are a good start to set up the map of stakeholders and resources. The process of establishing a stakeholder and resource map is described as follows.

3.2. Realization of the stakeholders and resources map

The aim is to identify the resources available within and around each unit of study, as well as local actors who influence directly or indirectly the functioning of the single unit of study.

The construction of the map of resources and actors is based on a technique known as the Collective Rapid Conflict and Strategic Group Identification Survey [27].

The process of building the stakeholder and resource map can be summarized in 3 steps:

Step 1: Identify the stakeholders

To create a stakeholder map, the first step is to identify all the stakeholders. These may include government agencies, people directly involved in the life of the school, local communities and associations, parents, employees, suppliers, students, etc.

Using whatever means available: brainstorming, focus groups, systematic or unsystematic individual surveys, literature, historical data, school records, etc., to make a comprehensive list of all the organizations, groups, and individuals who may have an influence on the life of the subject of study.

Step 2: Categorize the stakeholders

Once a comprehensive list of stakeholders is established, the focus becomes to categorize them relative to the topic or issue that will be evaluated. To do this, it is important to think about the resources and roles of each stakeholder in relation to the issue and group them into a few broad categories. Then, within each of these categories, group them into even more homogeneous subcategories. This will allow to divide the stakeholders into targeted groups and communicate more effectively and efficiently with each of them.

Step 3: Analyze the stakeholders

Still taking into account the issue, it is crucial to define the criteria according to which a stakeholder is indeed essential in this participatory process, or not. Any stakeholders that do not meet these criteria will be removed from the initial list of stakeholders.

It will then be determined, still in relation to the issue, on the axes of interest and influence as indicated in the figure below, where each stakeholder on the list selected fits in. This is not an arbitrary exercise, but a synthesis based on discussions and information collected during the exploratory phase.

For this purpose, a scoring method is recommended to rate the interest and influence of each stakeholder on three levels (low, medium and high). To successfully complete this stakeholder map, a good knowledge of the profile of each stakeholder is necessary, because the more partial or inaccurate the knowledge, the less relevant the results of the analysis will be.

A list of stakeholders and key resource needs will be developed.

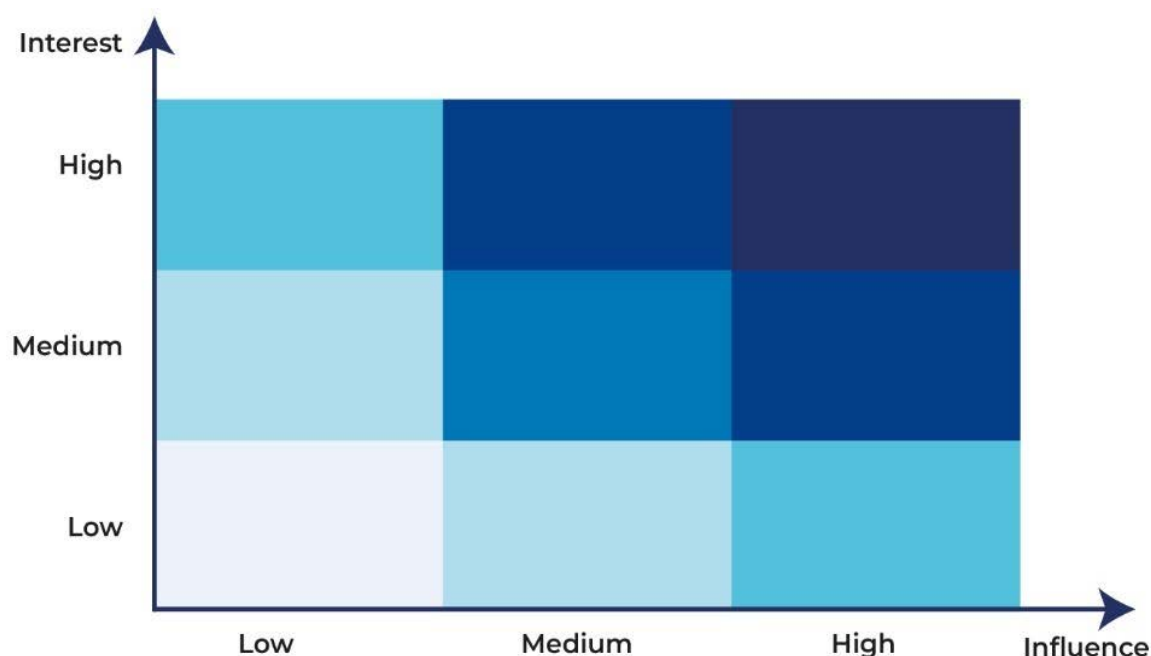


Figure 1. Stakeholder Mapping Model (Influence X Interest).

3.3. Organization and conduct of the typical workshop

Depending on the framework of the study, the codesign workshops can be one-day or two-days workshops. They usually unfold in two main stages each with several sub-stages. The first stage generally consists of identifying and evaluating the reality or the performance of the main subject of the study (a school for example) by stakeholders. The second builds upon the results of this first part to identify and plan actions to be taken to eventually generate a co-designed solution.

In the first phase, researchers can divide the participants into relatively homogeneous interest groups and designate a rapporteur and a representative to report back to the plenary.

This step precedes the launch of an open discussion based on a short open-ended interview guide addressing crucial points of the topic of interest. This guide provides a list of themes to be revisited, but not to be suggested directly to the participants.

The inventory is carried out by the members of each group with the help of a facilitator. Each working group should then identify evaluation criteria and proceed to an evaluation by scoring. After these group discussions, their work is presented in plenary accompanied by pooling and discussion of the assessment and evaluation to agree on the findings. The figure below summarizes the process of the first phase which starts with separate homogenous groups' discussions, followed by a plenary session where the groups go back together once they finish their work. With the help of a facilitator, they present their findings and discuss them with the other groups. The conclusion of the plenary should include a collective validation of the final findings before proceeding to the next phase.

As stated above, the second phase of the workshops generally allows for the collective identification and planning of corrective actions based on the results of the first phase.

This time though, the co-design work of possible solutions is to be conducted in heterogeneous groups. This makes it possible to leverage collective intelligence through fruitful conflicts to design solutions. It is also a solid starting point for the implementation of the proposed and planned solutions. The use of tools such as planning boards, 3D modeling, and scoring tools can make the activity playful, inspiring, and tangible.

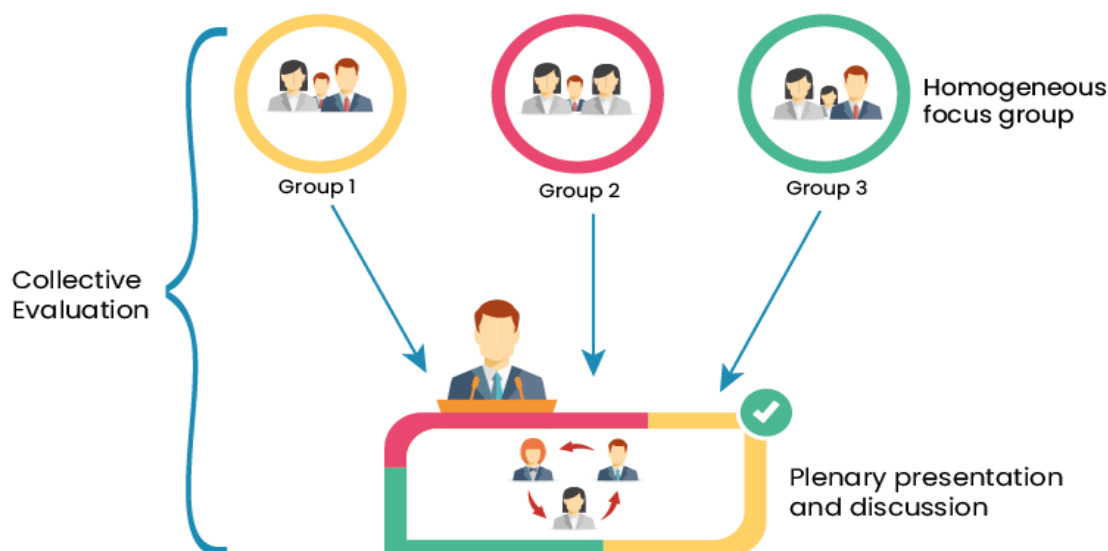


Figure 2. Collaborative evaluation and co-design of corrective actions – Phase 1.

The output of the work of each group must be as detailed as possible. At the end of this second work session, each heterogeneous group presents its work in plenary to leave room for discussions about the optimal options.

The workshops wrap up with a synthesis of the results.

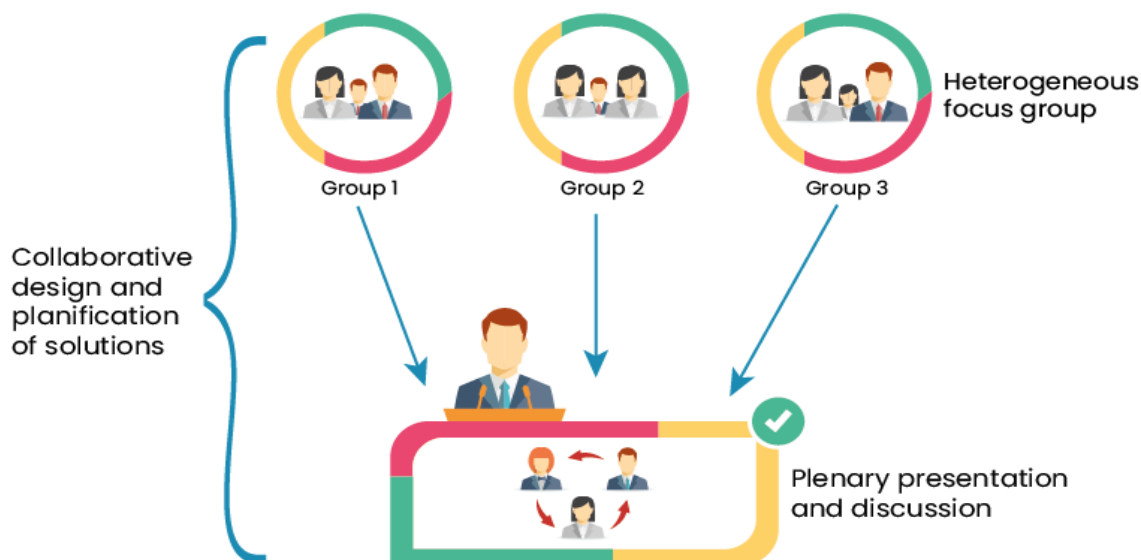


Figure 3. Collaborative evaluation and co-design of corrective actions – Phase 2.

4. Considerations for the Overall Success of this Approach

To ensure that the workshops will lead to optimal results, four basic principles need to be observed.

4.1. The proper representation of the actors involved and the free expression of all:

It is essential to ensure that the various categories of stakeholders are invited and represented. All the social categories concerned by the service, in particular the disadvantaged categories, must express their points of view without fear.

4.2. Skilled facilitators guiding group discussions

The role of facilitators is to ensure that the views of all stakeholders in each group are taken into account during the assessment and planning process. They assist the various stakeholders and groups in expressing their opinions, whatever they may be, in a constructive manner. They are also responsible for preventing conflict situations from escalating. They must be able to analyze issues and defuse explosive situations. Facilitators stand as mediators between participants, their ideas and their formulations, help participants to express their thoughts, reformulate them, question them, deepen them and present them appropriately in plenary. They should not be so involved in the community nor in the study unit or the territorial administration to the point of possibly putting the interests of one group ahead of those of others. Finally, they should be familiar with the discussion guides provided to master the facilitation of discussions. Instead of asking how classes are going in the context of the pandemic, a good facilitator will, for example, be interested in stories of how school operations were managed at the beginning and throughout the Covid 19 pandemic. Facilitators need to be able to engage participants' verbal expressions as well as their visual expressions. Their role is pivotal in the collaborative creativity stemming from the group discussions. Here are key points skilled facilitators embody.

- Mediating between the participants, does not act as a "stakeholder".
- Articulate the statement of work and keep the focus on the tasks' list.
- Encourage inclusion of all participants.
- Keep things moving toward the resolution of the statement of work.
- Stay objective and pay attention to timing.

Facilitators should agree on the facilitation roles beforehand to avoid any "mess-ups" that could negatively influence the group work. It is, therefore, preferable that one person facilitates, and another person takes notes.

4.3. Engage everyone in a constructive and genuine dialogue

It is important to ensure that participants' assessments and judgments of performance and reality do not degenerate into confrontations or invective that are destructive to the process. To do this, at the beginning of the workshop and after a round of introductions by the participants, the facilitators present the objectives, the program, and the approach to the workshop.

The working groups should be set up in such a way as not to disrupt or be disrupted by the discussions in the other groups. The discussion is initiated by an open-ended question that does not guide the answers. Only after a certain amount of time has passed can the moderator reopen the discussion to explore dimensions that may not have been covered.

Feedback is a delicate period, as participants become aware of the critical gaze that other categories of actors will have of them. Facilitators should keep in mind that the plenary session is not intended to produce an average assessment, but to compare points of view so that each category of stakeholder can adjust or not its assessment. Finally, the identification and planning of corrective actions must specify the roles, responsibilities, and needs of each category of stakeholder in addition to being fun and as precise as possible.

5. Conclusions

The initial objective of this work was to explore the foundations and the use of the collaborative evaluation and co-design (CEC) approach. The literature showed that addressing effectively problems in an increasingly complex world is the key benefit of a collaborative

approach to designing solutions-innovations. However, its implementation with the effective participation of all stakeholders remains challenging. Therefore, this work set out to fill in this significant gap. The major empirical findings are summarized based on the conclusions of the empirical chapters announced previously, epistemological foundations and application process. In the first chapter, the “Meaning making” by the actors was identified as the epistemological foundation of the CEC approach, followed by a detailed explanation using five theories to analyze the process of “meaning making” by actors and, thus, the process of the CEC approach; interactionist theory, actor-network theory, activity theory; co-design theory and systemic theory. This process was illustrated in the second chapter where the exploratory phase and establishment of the resources and stakeholders’ map, as well as the organization and conduct of the typical workshop, including their different sub-stages, were identified as the two major steps of the CEC approach use. The study concluded that this approach is effective in resulting in workable and sustainable solutions. However, its effectiveness is strictly conditioned on the good adoption of the different steps previously announced. Furthermore, the map of stakeholders and resources resulting from the exploration phase must be comprehensive and precise to generate productive and creative discussions later during the workshops. The quality of the results of the workshops depends largely on the ability of the facilitators to engage everyone in a constructive dialogue and to ensure that everyone can properly express their ideas on the various aspects of the issue.

Conflicts of Interest. The author declares no conflict of interest.

References

1. Prahalad, K.; Ramaswamy, V. *The Future of Competition: Co-creating Unique Value with Customers*. Ed. Harvard Business Press: Boston, MA, 2004, pp. 273.
2. Elizabeth, B.N.; Sanders Stappers, P.J. Co-creation and the new landscapes of design. *CoDesign* 2008, 4(1), pp. 5-18. <https://doi.org/10.1080/15710880701875068>
3. OECD. *OECD Employment Outlook 1997: July*; Organisation for Economic Co-operation and Development: Paris, France, 1997, pp. 204. https://doi.org/10.1787/empl_outlook-1997-en
4. Bodker, S. Creating Conditions for Participation: Conflicts and Resources in Systems Development. *Human-Computer Interaction* 1996, 11(3), pp. 215-236. https://doi.org/10.1207/s15327051hci1103_2
5. Steen, M.; Manschot, M.; Koning, N.D. Benefits of Co-design in Service Design Projects. *International Journal of Design* 2011, 5(2), pp. 53-60.
6. Zittoun, T.; Brinkmann, S. Learning as Meaning Making. In *Encyclopedia of the Sciences of Learning*; Seel, N. M., Ed.; Springer, Boston, MA, 2012, pp. 1809-1811. https://doi.org/10.1007/978-1-4419-1428-6_1851
7. Conein, B. Erving Goffman, les Moments et leurs hommes, 1988. *Sociologie du travail* 1990, 32(2), pp. 257-259.
8. Bertalanffy, L.V. General Systems Theory as Integrating Factor in Contemporary Science. *Akten des XIV. Internationalen Kongresses für Philosophie* 1968, 2, pp. 335-340. <https://doi.org/10.5840/wcp1419682120>
9. Carter, M. J.; Fuller, C. Symbolic Interactionism. *Sociopedia.isa* 2015, pp. 1-17. <https://doi.org/10.1177/205684601561>
10. Morrisette, J.; Guignon, S.; Demazière, D. De l'usage des perspectives interactionnistes en recherche. *Recherches qualitatives* 2011, 30(1), pp. 298. <https://doi.org/10.7202/1085477ar>
11. Turchany, G. La théorie des systèmes et systémiques. 2014, pp. 1-24. Available online: <https://inventin.lautre.net/livres/Turchany-Theorie-des-systemes.pdf> (Accessed on 12- Aug- 2022).
12. Berbaum, J. *Étude systémique des actions de formation*; Presses Universitaires de France : Paris, France, 1982 ; pp. 262. <https://doi.org/10.3917/puf.berba.1982.01>
13. Morris, D.; Adams, K. The Whole is more than the Sum of its Parts: Understanding and Managing Emergent Behavior in Complex Systems. *CrossTalk* 2013, 26(1), pp. 15-19.
14. Leblanc, S.; Ria, L.; Dieumegard, G.; Serres, G.; Durand, M. Concevoir des dispositifs de formation professionnelle des enseignants à partir de l'analyse de l'activité dans une approche enactive. *Activités* 2008, 05(1). <https://doi.org/10.4000/activites.1941>

15. Engeström, Y.; Miettinen, R.; Punamäki, R.L. *Perspectives on activity theory*; Cambridge University Press: Cambridge, United Kingdom, 1999, pp. 484.
16. Callon, M.; Ferrary, M. Les réseaux sociaux à l'aune de la théorie de l'acteur-réseau. *Sociologies pratiques* 2006, 13(2), pp. 37-44. <https://doi.org/10.3917/sopr.013.0037>
17. Akrich, M.; Callon, M.; Latour, B. A quoi tient le succès des innovations ? 1 : L'art de l'intéressement; 2 : Le choix des porte-parole. Gérer et Comprendre. Annales des Mines - Annales des mines. Gérer et comprendre - Gérer & comprendre, Eska, 1988, pp.4-17, 24-29.
18. Clegg, S.; Haugaard, M. *The SAGE Handbook of Power*. Ed. SAGE Publications Ltd: London, United Kingdom, 2022; pp. 504. <https://doi.org/10.4135/9780857021014>.
19. Boudhrâa, S.; Dorta, T. Le codesign comme nouvelle approche pédagogique dans les ateliers de conception : étude exploratoire à travers le vécu des étudiants. *Enjeux et société* 2020, 7(2), pp. 74-107. <https://doi.org/10.7202/1073361ar>.
20. Abrassart, C.; Gauthier, P.; Proulx, S.; Martel, M.D. Le design social : une sociologie des associations par le design ? Le cas de deux démarches de codesign dans des projets de rénovation des bibliothèques de la Ville de Montréal. *Lien social et Politiques* 2015, (73), 117–138. <https://doi.org/10.7202/1030954ar>.
21. Durall, G.E.; Bauters, M.; Hietala, I.; Leinonen, T.; Kapros, E. Co-creation and co-design in technology-enhanced learning: Innovating science learning outside the classroom. *Interaction Design and Architecture(s) Journal* 2019, 42, pp. 202-226. https://doi.org/10/doc/42_10.pdf.
22. Ruppar, A.; Roberts, C.; Olson, A. Developing Expertise in Teaching Students with Extensive Support Needs: A Roadmap. *Intellectual and Developmental Disabilities* 2018, 56, pp. 412-426. <https://doi.org/10.1352/1934-9556-56.6.412>.
23. Wenger, E.; McDermott, R.A.; Snyder, W. *Cultivating Communities of Practice: A Guide to Managing Knowledge-Seven Principles for Cultivating Communities of Practice*; Harvard Business Review Press: Boston, MA, 2002; pp. 304.
24. Gauvin, L.J. L'approche collaborative de recherche : Faire de la recherche « avec » plutôt que « sur » des personnes. Une approche à privilégier en sciences infirmières pour faire progresser les connaissances. *Perspective infirmière : revue officielle de l'Ordre des infirmières et infirmiers du Québec* 2016, 13, pp. 42-44.
25. Voogt, J.; Laferrière, T.; Breuleux, A.; Itow, R.C.; Hickey, D.T.; McKenney, S. Collaborative design as a form of professional development. *Instr Sci* 2015, 43(2), pp. 259-282. <https://doi.org/10.1007/s11251-014-9340-7>.
26. Desgagné, S.; Bednarz, N.; Lebuis, P.; Poirier, L.; Couture, C. L'approche collaborative de recherche en éducation: un rapport nouveau à établir entre recherche et formation. *Rse* 2002, 27(1), pp. 33-64. <https://doi.org/10.7202/000305ar>.
27. Bierschenk, T.; Olivier de Sardan, J.P. ECRIS : Enquête Collective Rapide d'Identification des conflits et des groupes Stratégiques. *Bulletin de l'APAD* 1994, 7. <https://doi.org/10.4000/apad.2173>.

Citation: Alladatin, J. The collaborative evaluation and co-design (CEC) approach: prospects for effective solutions-innovations, epistemological foundations and implementation process. *Journal of Social Sciences* 2022, 5 (3), pp. 121-131. [https://doi.org/10.52326/jss.utm.2022.5\(3\).09](https://doi.org/10.52326/jss.utm.2022.5(3).09).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).10](https://doi.org/10.52326/jss.utm.2022.5(3).10)
UDC 658.14/.17:005.915:330.4



CURRENT STATE OF KNOWLEDGE IN THE FIELD OF FINANCIAL PERFORMANCE ANALYSIS

Teodora-Valentina Lica*, ORCID: 0000-0002-8951-0693

Transilvania University of Braşov, Bulevardul Eroilor 29, Braşov 500036, Romania

*Corresponding author: Teodora-Valentina Lica, email: teodora.lica@hotmail.com

Received: 05. 08. 2022

Accepted: 06. 28. 2022

Abstract. This paper presents different methods of measuring performance, including the traditional method, investor indicators, the "balanced scorecard" method, the non-financial indicators method, the performance method, the stock market performance and the forecast performance. In order to compare the results of different companies in a particular sector of activity, there are benchmarks of the sector over a certain period of time, but they should contain much more data. The development of an unanimously accepted software program for calculating and comparing the financial performance of companies in a certain sector of activity, but also for examining and establishing the similarities and differences of performance of the companies in different countries would be very helpful for both financial planning of commercial companies as well as for the economic-strategic planning of the nations.

Keywords: *financial performance analysis, indicators, decision, investment, ratio, bankruptcy.*

Rezumat. Lucrarea de faţă prezintă diferite metode de măsurare a performanţei, printre care se numără metoda tradiţională, indicatorii investitorilor, metoda balanţei score-card, metoda indicatorilor non-financiari, cea a performanţei, a performanţei la bursă şi performanţa pentru prognoză. În scopul comparării rezultatelor diferitelor companii într-un anumit sector de activitate există indicatori de referinţă ai sectorului pe o anumită perioadă de timp, însă aceştia ar trebui să conţină mult mai multe date. Dezvoltarea unui program de soft unanim acceptat pentru calcularea şi compararea performanţei financiare a firmelor într-un anumit sector de activitate, dar şi pentru examinarea şi stabilirea asemănărilor şi deosebirilor performanţelor companiilor din diferite ţări ar fi de mare ajutor atât pentru planificarea financiară a societăţilor comerciale, cât şi pentru planificarea economico-strategică a naţiunilor.

Cuvinte cheie: *analiza performanţei financiare, indicatori, decizie, investiţie, raport, faliment.*

1. Introducere

Acest articol îşi propune cercetarea progreselor teoretice ale analizei performanţei financiare. Este o tratare selectivă în sens temporal şi tematică a celor mai importanţi paşi către măsurarea şi compararea datelor financiare ale firmelor din diverse domenii de activitate.

Investigarea stadiului actual al cunoașterii în domeniul analizei performanței financiare a entităților comerciale a necesitat studierea a zeci de cărți și articole științifice publicate în diferite limbi, perioade și zone ale globului.

Toate firmele se văd nevoite să ia decizii în domeniul financiar, însă orice decizie financiară are două părți. O parte se referă la costul deciziei financiare, fapt cert care poate fi cunoscut prin calcul, iar cealaltă parte se referă la beneficiile produse de către aceasta în timp, beneficii care nu sunt știute cu certitudine de către cei care iau decizia financiară.

În scopul cunoașterii firmei la un moment dat este necesară efectuarea unei analize economico-financiare, care ne va permite să studiem capacitatea întreprinderii în îndeplinirea angajamentelor de plată, fie la furnizori, bănci sau entități publice.

Un alt punct de interes îl reprezintă dacă firma, cu structura economică, financiară și de cost actuală, poate fi viabilă în viitor. În structura economică includem activele societății pentru desfășurarea activității de producție, mai precis stocuri, utilaje, bani pentru realizarea produselor sau executarea serviciilor. În structura financiară includem diferitele surse de finanțare folosite de către firmă, adică aportul asociaților la înființarea companiei, datorii sau credite pe diferite perioade. Doar o combinație optimă între resursele financiare proprii și cele externe va permite atingerea obiectivelor companiei. Referitor la structura costurilor, acestea pot fi fixe, gen chirii, impozite, asigurări, personal, reclame, sau costuri variabile cum ar fi costurile de achiziție, reparații sau întreținere. Existența unui echilibru între structura economică și cea financiară duce la solvabilitate.

Analiza performanței financiare este utilă atât pentru societate cât și pentru furnizori și potențialii investitori. Setul complet de decizii de investiții și finanțare trebuie să se reflecte într-un plan financiar care să ne permită analizarea consecințelor financiare viitoare în urma luării deciziilor actuale.

2. Metode de Analiză

A. O abordare diferită a evoluției analizei performanței financiare

În domeniul economic, analiza este o metodă de cercetare bazată pe descompunerea unui obiect sau fenomen în elemente mai simple și/sau în părțile sale componente și este un instrument indispensabil activității manageriale.

În scopul cunoașterii stadiului la care se află o societate comercială, analiza economico-financiară este crucială. Aceasta ne oferă informații cu privire la mersul și direcția în care se îndreaptă compania, dar ne poate ajuta în găsirea unor modalități de ameliorare a activității [1].

Toate întreprinderile doresc performanță căci aceasta este sine-qua-non lor și numai cu ajutorul acesteia au posibilitatea de a avansa și a se dezvolta. Măsurarea performanței este indispensabilă căci fără aceasta nu putem face comparații cu alte firme din sector sau cu datele din anii trecuți. În același timp, evaluarea performanței are un aport substanțial la bunăstarea companiilor prin scoaterea în evidență a punctelor forte și a celor debile ale afacerii [2].

Revizuirea literaturii de specialitate în domeniul analizei performanței financiare arată că aceasta a reprezentat un subiect de mare interes, cu rădăcini în lucrarea "Study of Credit Barometrics" publicată în anul 1919 a cărui autor este Alexander Wall. Există multe texte academice, cărți și articole, în care interpretarea situațiilor financiare s-a realizat prin diverse metode de analiză. Vom prezenta câteva dintre acestea.

A.1. Metoda tradițională a analizei performanței financiare se concentrează pe analiza și interpretarea indicatorilor financiari. Aceștia stabilesc relația numerică între două cantități,

în cazul nostru între diferite valori din bilanț sau din contul de profit și pierdere. Aceștia arată punctele forte și punctele slabe ale unei afaceri și pot indica unele probabilități și tendințe.

Măiestria în conducerea unei întreprinderi depinde extraordinar de mult de identificarea celor mai importanți indicatori, controlarea și optimizarea acestora [3].

Cărțile de finanțe și contabilitate abundă de informații referitoare la indicatorii financiari, utilizarea acestora și interpretarea rezultatelor obținute. Datorită faptului că numărul de rapoarte între cifrele din situațiile financiare și cele din contabilitate sunt nelimitate și depind în mare măsură de imaginația analistului, și-a făcut loc ideea că analiza financiară este impregnată de subiectivism. Totuși există o serie de indicatori comun acceptați [4].

Pe baza bilanțului se pot analiza solvabilitatea și lichiditatea ca și măsură a rezistenței firmelor pe piață. Solvabilitatea depinde de valoarea activelor și de dimensiunea datoriilor angajate, în timp ce lichiditatea poate fi considerată ca fiind o măsură a vitezei de rotație a activului în comparație cu viteza de rotație a pasivului. În acest scop, se pleacă de la indicatorii financiari care controlează numerarul. Datele referitoare la stocuri, debitori și capital circulant sunt de o maximă importanță în măsurarea performanței firmelor.

În decada anilor '80 se folosea adesea expresia „managementul ca factor decisiv”. Strategiile majorității companiilor din statele capitaliste s-au axat pe maximizarea profitului și managementul numerarului. Profitul pe Acțiune este un indicator deseori folosit de acționari pentru a judeca performanța managementului companiei. Însă maximizarea profitului nu este totul, după cum vom vedea în continuare.

Atunci când stabilitatea financiară sau profitabilitatea este amenințată de condițiile economice, industriale sau de operare ale entității, sau există o presiune excesivă asupra conducerii să îndeplinească cerințele de îndatorare, sau profitul net personal este amenințat în mod semnificativ, conducerea se va confrunta cu stimulente sau presiuni pentru a recurge la practici frauduloase [5].

Este mai convenabil să rezumăm informațiile despre rentabilitatea financiară în termeni procentuali decât în valori, deoarece procente sunt aplicate la orice sumă care este investită. Întrebarea la care vrem să răspundem este aceasta: cât de mare este randamentul obținut de fiecare unitate monetară investită [6]?

A.2. *Indicatorii investitorilor*

Indicatorii investitorilor sunt poate printre cei mai relevanți indicatori, prin prisma importanței investitorilor în companie. Ei sunt cei care pun la dispoziție fondurile necesare firmei și pot contribui cu aportul de cunoștințe, abilități și experiență la extinderea acesteia. De interes crucial pentru investitori sunt profitul pe acțiune, raportul prez/câștig, randamentul dividendelor, datorii/capital, rata de acoperire a dobânzilor, rata de acoperire a dividendelor [3].

Proiectele private de investiție se fac cu ajutorul studiilor de fezabilitate economică pe baza de indicatori care permit luarea deciziei de a investi sau nu într-un proiect [7].

Aceste studii furnizează informații viabile care vor fi analizate de specialiști și care vor permite, depinzând și de conjunctura economică, implementarea ideii de afaceri [8], urmând apoi efectuarea unui studiu de piață cu privire la bunul ce urmează a fi fabricat și /sau serviciul care urmează a fi prestat. Se obțin indicatori utili pentru investitori care să ducă la decizia de a plasa sau nu capital în proiectul respectiv [9].

Diferiți autori vorbesc nu doar despre evaluarea performanței anterioare a unei companii ci și despre cauzele din spatele performanței și modul în care performanța reflectă

strategia companiei. Judecățile evaluative evaluează dacă performanța este mai bună sau mai proastă, în comparație cu un punct de referință relevant, cum ar fi performanța istorică a companiei, performanța unui concurent sau așteptările pieței [10].

A.3. *Metoda Balanced Scorecard a analizei performanței financiare*

La începutul anilor 1990 apare conceptul de "Balanced Scorecard", un sistem dezvoltat în scopul alinierii activităților afacerii la viziunea și strategia acesteia, a îmbunătățirii comunicațiilor interne și externe și a monitorizării performanței afacerii [11]. Balanced Scorecard a fost considerată o unealtă a managementului care folosește atât date financiare cât și non-financiare [12], dar care este mai eficientă decât analiza ratelor financiare deoarece aceasta din urmă nu este suficient de cuprinzătoare pentru a evalua performanța generală [13].

Metoda este considerată a fi una integratoare, ea folosind atât indicatori financiari cât și indicatori de natură nefinanciară, evaluând toate aspectele firmei, inclusiv obiectivele generale ale firmei. În afară de profitabilitate, metoda extrage date și despre responsabilitatea socială corporativă, ajungând a fi numită „triplu” datorită informațiilor cu privire la oameni (angajați), mediu (planetă) și profit. Se introduce astfel încet conceptul de performanță în responsabilitatea socială corporativă [14].

A.4. *Metoda indicatorilor non – financiari*

La debutul anilor 80 se aduce în discuție faptul că sistemele de măsurare a performanței bazate pe indicatori non-financiari constituie răspunsul managementului calității la cererea întreprinderilor pentru sisteme de măsurare, diferite de cele tradiționale, care permit gestionarea unor variabile care astăzi sunt considerate cheie pentru luarea deciziilor strategice în cadrul companiei [15].

Managementul calității se bazează pe utilizarea indicatorilor non-financiari pentru a observa performanța în afaceri; acest lucru se întâmplă deoarece indicatorii financiari tradiționali nu reflectă, în întregime, toate beneficiile strategiilor de management care se decid să fie adoptate de către companie [16].

Și capacitatea este judecată uneori ca fiind un indicator non-financiar, totuși unul extrem de important pentru performanța firmei [3].

A.5. *Metoda performanței*

Sistemele de măsurare a performanței joacă un rol fundamental în dezvoltarea planurilor strategice, întrucât sunt legate de obiectivele strategice și de scopurile care contribuie la crearea de valoare în afaceri [17].

Starea de competitivitate a firmelor într-un anumit domeniu duce la un nivel crescut de eficacitate și productivitate, care la rândul lor duc la performanța firmei și durabilitatea acesteia pe piață [18].

Dat fiind faptul că analiza financiară nu apreciază într-un mod complet eficiența firmelor, performanța ar trebui analizată prin mai multe metode, dintre care enumerăm: analiza pe baza bilanțului, analiza pe baza contului de profit și pierdere și analiza pe baza ratelor. Strategia dezvoltată a companiei va trebui să ia în calcul analiza evoluției acesteia pe minim cinci ani [19].

Analiza performanței financiare trebuie să ducă la înțelegerea performanțelor obținute și a riscurilor inerente activității întreprinderii. Istoricul situațiilor financiare previzionează abilitățile firmelor în obținerea fluxurilor de venit și perspectivele acestora. Companiile au nevoie de comparare cu întreprinderile asemănătoare în scopul stabilirii parametrilor comuni de risc și rentabilitate [20].

A.6. Performanța la bursă

Studiind corelația dintre performanța economică și financiară și performanța bursieră în companiile românești din industria petrolului și a comerțului cu amănuntul, Buse L. și Stefan I.O. au analizat în anul 2014 date din perioada 2010 – 2013 pentru câte 3 companii din aceste sectoare și au ajuns la concluzia că există corelații puternice, fie ele directe sau inverse între indicatorii de performanță economico-financiară și indicatorii performanței bursiere [21]. Pe aceeași temă au scris și alți autori din țara noastră, aceștia analizând "Impactul performanțelor economico-financiare asupra performanțelor bursiere ale companiilor din industria prelucrătoare listate la BVB", și demonstrând o legătură strânsă și directă între valoarea capitalizată și indicatorii de performanță [22].

Prin calcularea unui număr mic de rate, adesea este posibil să se construiască o imagine revelatoare a poziției și performanței financiare a unei afaceri. Așadar, nu este surprinzător că ratele sunt utilizate pe scară largă de către cei care sunt interesați de afaceri și de performanța afacerii. Ratele nu sunt greu de calculat; cu toate acestea, pot fi dificil de interpretat [23]. La aceeași concluzie ajung și alți autori susținând apoi că, având în vedere cantitatea mare de variabile incluse în situațiile financiare, putem crea o listă lungă de rate semnificative. Nu există o listă standard de rapoarte sau un calcul standard al acestora [24].

Alt autor pledează pentru înțelegerea afacerii înainte de a analiza cifrele. Doar dacă înțelegem afacerea vom putea analiza situațiile financiare care, în final, sunt o reflectare a politicilor și a comportamentului companiei [25].

Există entități care folosesc indicatori cheie de performanță (KPI) pentru a măsura gradul de succes atins în îndeplinirea obiectivelor lor. KPI-urile oferă managerilor informații utile în luarea deciziilor strategice și operaționale. Aceștia includ atât date financiare cât și date non-financiare pentru măsurarea performanței [23].

Măsurarea performanței unui portofoliu presupune calcularea randamentelor obținute de fond într-o anumită perioadă de timp, cunoscută și sub denumirea de perioadă de evaluare. Perioada de evaluare utilizată pentru monitorizarea performanței poate fi săptămânală, lunară, trimestrială sau anuală. Pentru a calcula randamentele pot fi utilizate diferite metode, fiecare dând un rezultat diferit [26].

Informațiile din situațiile financiare ar putea descrie stătea de performanță a companiei atât pentru cei din interiorul acesteia cât și pentru cei din exteriorul ei [27].

Există mai multe motive pentru examinarea datelor financiare sub forma ratelor, din diferite categorii (de exemplu lichiditatea, structura capitalului și profitabilitatea) care sunt adesea foarte corelate între ele și au un grad sporit de mișcare în timp [28].

Unii autori au încercat clarificarea termenului de performanță financiară prin rata totală de rentabilitate, aceasta fiind "câștigul sau pierderea totală suferită de o investiție într-o anumită perioadă. Din punct de vedere matematic, rentabilitatea totală a unei investiții este suma tuturor distribuțiilor în numerar (de exemplu, plăți de dividende sau dobânzi) plus modificarea valorii investiției, împărțită la valoarea investiției la începutul perioadei"[29]. Întrebându-se ce date ar fi relevante pentru îmbunătățirea performanței într-o întreprindere, alți autori afirmă că nu toate datele referitoare la performanța din trecut sunt relevante pentru viitor [30].

A.7. Performanța pentru prognoză

Predicția falimentului firmei este o problemă de o importanță esențială și atât investitorii și băncile cât și acționarii sunt interesați de previziuni ale situației financiare viitoare a firmei.

Falimentul firmelor și imposibilitatea recuperării creditelor acordate de către bănci aduc în prim plan evaluarea performanței predictive și se trece la crearea de modele predictive prin analizarea variabilelor de performanță [31].

Z-Score este un model creat pentru măsurarea solvenței firmelor care aplică analiza multiplă în predicții [32-36].

Prin prognoza financiară se combină și se analizează indicatorii financiari, statisticile, politicile și deciziile companiei [37].

Folosind tehnici de extragere a datelor, alți autori propun modele de predicție a câștigurilor bazându-se pe 'data mining technique' [38].

B. Indicatori de analiză a performanței financiare a firmelor

Indicatorii performanței financiare sunt coeficienți sau rate care se obțin prin relația de împărțire între două date financiare sau contabile și permit analiza stării actuale sau trecute ale unei organizații, pe baza nivelurilor optime definite pentru acestea.

Obiectivul indicatorilor este acela de a obține informații diferite și complementare cu cele ale cifrelor absolute, utile pentru analiză, fie ele de natură patrimonială, financiară sau economică.

În ceea ce privește indicatorii de analiză a performanței financiare a firmelor, numeroși autori folosesc cele patru categorii propuse de Lev (1974), acestea fiind rentabilitate, eficiență, solvabilitate și lichiditate [39]. În continuare se prezintă ratele întâlnite cel mai frecvent.

B.1. Ratele de rentabilitate

Rentabilitatea este o noțiune care se aplică oricărei acțiuni economice în care sunt mobilizate mijloace materiale, umane și financiare pentru a obține rezultate. În literatura economică, deși termenul de rentabilitate este folosit într-un mod foarte variat și există multe aproximări doctrinare care afectează una sau altă fațetă a acestuia, în sens general rentabilitatea se numește măsura performanței care, într-o anumită perioadă de timp produce capitalul folosit în ea. Aceasta presupune compararea dintre veniturile generate și mijloacele folosite pentru obținerea acestuia, pentru a permite alegerea între alternative sau pentru a judeca eficiența acțiunilor desfășurate, în funcție de faptul că analiza efectuată este a priori sau a posteriori.

Ratele de rentabilitate încearcă să măsoare modul în care firma este capabilă să genereze un surplus pentru a putea fi distribuit acționarilor, surplus care poate fi comparat cu totalul resurselor investite în activitate, ca măsură a eficienței atinse. Rentabilitatea măsoară performanța activelor companiei performanța activelor firmei, cum ar fi resursele cu care au contribuit acționarii și oferă unele indicii ale gradului de succes în realizarea creării de beneficii pentru proprietarii săi [40]. În sens general, ratele de rentabilitate exprimă beneficiul obținut în comparație cu alte cifre cheie din situațiile financiare [23].

B.2. Ratele de lichiditate

Ratele de lichiditate măsoară capacitatea de plată pe care o are compania pentru a-și face față datoriilor pe termen scurt. Se referă la numerarul disponibil pentru achitarea datoriilor. Aceste rate exprimă nu numai manipularea finanțelor totale ale companiei, ci și capacitatea managerială de a converti anumite active și pasive curente în numerar. Acestea ușurează examinarea situației financiare a companiei în comparație cu altele, în acest caz rapoartele fiind limitate la analiza activelor și pasivelor curente.

Pentru a putea analiza ratele lichiditate trebuie observat în primul rând echilibrul financiar al firmelor și a putea determina capitalul cu care se lucrează (activul curent – pasiv

curent). Aceste rate arată capacitatea firmelor de a-și plăti pasivele pe termen scurt. În acest scop se studiază viteza la care elementele de activ pot fi transformate în lichidități pentru îndeplinirea la termen a obligațiilor de plată și gradul de exigibilitate a elementelor de pasiv, acestea două fiind puse în relație una cu cealaltă [24, 41, 42].

Mărimea întreprinderii, vechimea acesteia pe piață, domeniul în care activează, structura și viteza de rotație a activelor circulante reprezintă unii dintre factorii care influențează nivelul ratelor de lichiditate. Întrucât lichiditatea este un termen care se referă la solvabilitatea poziției financiare generale măsurabilă prin capacitatea unei companii de a-și achita obligațiile pe termen scurt, aceste rate evaluează capacitatea companiei de a plăti pentru a-și onora datoriile, pe termen scurt. Cu alte cuvinte, lichiditatea măsoară capacitatea de plată pe care o are compania pentru a-și onora datoriile pe termen scurt și, prin urmare, determină numerarul disponibil pentru achitarea datoriilor. Ele exprimă nu doar gestionarea finanțelor totale ale companiei, ci capacitatea managerială de a converti anumite active și pasive curente în numerar. Ele ușurează examinarea situației financiare a companiei în comparație cu altele, în acest caz rapoartele fiind limitate la analiza activelor și pasivelor curente.

Analiza lichidității unei companii este deosebit de importantă pentru creditor; dacă o companie are o poziție slabă de lichiditate, poate crea un risc de credit și poate duce la incapacitatea de a efectua plăți importante și periodice de dobânzi.

B.3. Ratele de solvabilitate și îndatorare

Ratele de solvabilitate și îndatorare au scopul de a măsura gradul de îndatorare al societății respective și modul în care creditorii participă la finanțarea companiei. Totodată, acestea stabilesc nivelul riscului pe care și-l asumă creditorii și acționarii ori proprietarii firmei. Acest tip de raport reflectă sprijinul pe care îl are firma pentru achitarea datoriilor, determinând în același timp cantitatea de resurse obținute de la terți. Aceste rate arată componența pasivelor și ponderea lor relativă în capital sau patrimoniu.

Diferiți autori afirmă că prin ratele de solvabilitate și îndatorare se verifică dacă firma își va putea satisface datoriile pe termen lung [24, 40, 42]. Cu ajutorul acestor rate se face un studiu al surselor de finanțare care ar fi mai utile și s-ar plia mai mult pe activitatea firmei și a capacității de a face față cheltuielilor financiare (dobânzi, comisioane etc.), în scopul căutării costului cel mai mic pentru o astfel de finanțare [43].

B.4. Metode de măsurare a riscului de faliment

Insolvența este termenul folosit pentru a descrie performanța negativă a unei afaceri [34]. După criterii financiare, eșecul poate fi definit ca insuficiență a fluxului de numerar pentru satisfacerea obligațiilor curente. Aceste obligații pot include datorii mari către furnizori și angajați, cu pierdere constantă în procesele legale, precum și rambursarea capitalului și a dobânzilor [44]. Ca și indicator al eșecului poate fi folosit fluxul insuficient de numerar. Fluxul de numerar împreună cu valoarea companiei au fost și ele folosite în identificarea momentului în care o societate se află în dificultate financiară [45].

Falimentul este un alt concept financiar asociat cu dificultățile financiare. Un tip de faliment se referă la activele totale ale unei afaceri. O companie este în faliment atunci când, la cererea unei instanțe, se solicită lichidarea bunurilor sale active sau se încearcă restructurarea plăților [34]. Primele studii de predicție a falimentului au fost realizate de Ramster și Foster (1931), Fitzpatrick (1932), Winakor și Smith (1935), Merwin (1942) și Uğurlu și Aksoy (2006) [46-49]. Printre primele contribuții la crearea de modele explicative și

predictive ale falimentului au fost modelele create de Beaver (1966), Altman (1968) și Ohlson (1980).

Formal, eșecul financiar a fost studiat pentru prima dată de către Beaver (1966), iar lucrarea sa examinează dacă rapoartele financiare pot furniza informații pertinente pentru a evalua și a prezice accidente, insolvențe provizorii, dividende neplătite și descoperiri de bani [50]. Beaver (1966) a oferit o viziune mai amplă a falimentului financiar, dar avea totuși anumite limitări metodologice. Altman (1968) sugerează dezvoltarea unor modele de analiză discriminantă care să poată fi folosite ca norme standard. Contribuie deci la consolidarea obiectivității în analizarea solvabilității și a riscului de faliment. Însă aplicarea modelului său este condiționată de cerințe teoretice (homoscedasticitatea și distribuția comună normală a factorilor), însă modelele create de acesta nu oferă informații detaliate pentru a specifica cauzele și structura internă a eșecului, chiar și atunci când sunt luate în considerare diferite orizonturi de timp [51].

Ohlson (1980) sugerează folosirea regresiei logistice pentru evaluarea probabilității de eșec. Acesta oferă o bază teoretică ce permite estimarea probabilității de eșec a companiilor care nu activează în domeniul financiar, luând în considerare patru elemente: mărimea firmei, structura sa financiară, rentabilitatea și lichiditatea. În fapt, managerii se pot interesa dacă într-o măsurătoare probabilistică firma poate să intre în faliment sau să întâmpine dificultăți într-o anumită perioadă de timp. Acesta coroborează faptul că îmbinarea indicatorilor pieței cu informațiile financiare duce la îmbunătățirea într-o manieră substanțială a capacității de a prevedea eșecurile financiare.

Diverse date externe firmei și semnale pot fi utilizate pentru creșterea acurateței modelului, cum ar fi de exemplu prețurile pieței sau volatilitatea fluxurilor de informații, modificări ale auditului etc [52].

3. Rezultate

Analiza financiară studiază situațiile financiare trecute și prezente ale entităților comerciale, putând face și previziuni pentru viitor. În alte cuvinte, pe baza datelor oferite de situațiile financiare, prin studierea metodică și sistematică a acestora obținem rezultate despre structura financiară, performanța și riscul entităților.

Indicatorii financiari sunt o modalitate valoroasă și ușoară de a interpreta cifrele găsite în situațiile financiare. Aceștia pot ajuta să răspundă la întrebări critice, cum ar fi dacă afacerea are stocuri sau datorii în exces, dacă clienții plătesc conform termenilor, dacă cheltuielile de exploatare sunt prea mari și dacă activele companiei sunt utilizate corespunzător pentru a genera venituri.

Pentru o viziune cât mai amplă a performanței financiare a unei firme, este recomandat a se studia deciziile luate în cadrul firmei, mediul în care activează, costul și prețul. Se analizează indicatorii rezultați din Bilanț, cei din Contul de profit și pierdere, și ratele obținute.

Indicatorii performanței financiare ghidează managerii spre o bună direcție a companiei, le oferă date despre obiectivele și standardele lor. Ei îi ajută pe manageri să-i ghideze spre strategii mai benefice pe termen lung, dar și în luarea deciziilor pe termen scurt. În orice companie ratele sunt importante pentru conducere deoarece oferă informații cu privire la operațiunile zilnice și atenționează despre probleme care necesită o imediată atenție. Indicatorii oferă informații și despre conexiunile care există între diferitele părți ale

afacerii și cunoașterea și interpretarea lor permite diferitelor zone funcționale ale firmei să lucreze împreună spre îndeplinirea obiectivelor companiei.

Dar indicatorii de analiză ai performanței financiare au anumite limite. Spre exemplu, unul dintre procedeele folosite este compararea rezultatelor firmei, a mărimilor sau a valorilor, atât absolute cât și relative, cu valori de referință. Aceste valori de referință sunt cele obținute din valorile medii ale cifrelor din diferite sectoare, respectiv sectorul economic de care aparține compania. Doar că publicarea valorilor medii pentru un sector nu este în mod normal însoțită de informații cu privire la gradul de dispersie a datelor eșantionului în raport cu măsurarea. Acest lucru împiedică compararea datelor obținute de o firmă cu valorile medii de pe piață.

Analiza rentabilității este importantă deoarece, chiar pornind de la multitudinea obiectivelor cu care se confruntă o companie, unele bazate pe profitabilitate, altele pe creștere, stabilitate și chiar pe servicii oferite comunității, în analiza performanțelor financiare a firmelor, centrul discuției tinde să fie situat în polaritatea dintre rentabilitate și securitate sau solvabilitate ca variabile fundamentale ale întregii activități economice.

Exprimat în alte cuvinte, limitele economice ale oricărei activități comerciale sunt rentabilitatea și securitatea, obiective în mod normal contradictorii, întrucât rentabilitatea, într-un anumit fel, este recompensa pentru riscul asumat și, în consecință, cea mai sigură investiție nu coincide de obicei cu cea mai profitabilă. Cu toate acestea, este necesar să se țină seama de faptul că, pe de altă parte, scopul solvabilității sau stabilității întreprinderii este strâns legat de cel al rentabilității, în sensul că rentabilitatea este un determinant decisiv al solvabilității, întrucât obținerea rentabilității este o cerință necesară pentru menținerea firmei pe piață. Exprimat în sens analitic, rentabilitatea unei firme poate fi determinată ca un coeficient între un concept de rezultat și un concept de capital investit pentru a obține acel rezultat.

O imagine și o poziție bună față de intermediarii financiari necesită: menținerea unui nivel suficient de capital de lucru pentru a efectua operațiunile care sunt necesare pentru a genera un excedent care să permită companiei să își continue activitatea în mod normal și să producă suficienți bani pentru lichidarea datoriilor pe termen scurt. Ele indică capacitatea companiei de a-și îndeplini obligațiile pe termen scurt.

Indicatorii de lichiditate se caracterizează prin caracter static la sfârșitul anului. Deși sunt foarte utili pentru investitori și creditori, deoarece permit evaluarea respectării obligațiilor de către companie, aceasta nu înseamnă că este important și pentru conducere să examineze fluxurile de numerar viitoare.

4. Concluzii

Dintr-o abordare contingentă, literatura de specialitate aduce în prim plan importanța analizei performanței financiare și măsurarea rezultatelor prin diferite metode. Chiar dacă există numeroase abordări, nu există un instrument de control unanim acceptat pentru compararea performanțelor obținute de firme din diferite industrii, țări etc. Cu toate acestea atât indicatorii financiari cât și cei nefinanciari, metoda balanței score-card și metoda performanței cartografiază informațiile relevante pentru luarea deciziilor în ceea ce privește viitorul companiilor.

Dezvoltarea și validarea modelelor descrise anterior oferă informații prețioase referitoare la natura proceselor financiare și a celor de organizație.

Proiectarea situațiilor financiare este imperativă pentru conducerea întreprinderii, deoarece este foarte important să facem niște analize prospective pe termen lung pentru a dezvolta strategii și pentru a face față provocărilor ce pot apărea.

Mulțumiri: Aș dori să-mi exprim sincera recunoștință față de doamna Prof. univ. dr. Bărbuță-Mișu Nicoleta, conducătorul științific al tezei de doctorat pentru sprijinul acordat la fiecare etapă a proiectului de cercetare.

Conflicte de Interes. Autorul nu declară niciun conflict de interese.

Bibliografie

1. Anghel, M.G. Aspecte teoretice privind conținutul și rolul analizei economico-financiare. *Revista Română de Statistică* 2019; 8, 3.
2. Botnari, N.; Nedelcu, A. Evaluarea performanței financiare a întreprinderilor industriale prin prisma dimensiunilor de profitabilitate, rentabilitate și creștere. *ASEM Economica* 2015, 3 (93), pp. 49-59.
3. Gaskin, T. Indicatori financiari perfecți. *Editura Națională*: București, România. 1998, 13-72.
4. Feroz, E.; Kim, S.; Raab, R. Financial Statement Analysis: A Data Envelopment Analysis Approach. *Journal of the Operational Research Society* 2003; 54, pp. 48-58.
5. Ravisankar, P.; Ravi, V.; Raghava Rao, G.; Bose, I. Detection of financial statement fraud and feature selection using data mining techniques. *Decision Support Systems* 2011; pp. 491-500.
6. Ross, S. A.; Westerfield, R. W.; Jaffe, J. F. Finanzas corporativas (9 ed.). *McGraw-Hill*: Ciudad de México, México. 2012, p. 302.
7. Baca Urbine, G. Evaluación de proyectos. *McGraw-Hill*: Ciudad de México, México. 2016.
8. Sapag Chain, N.; Sapag Chain, R.; Sapag Puelma, J. Preparación y Evaluación de Proyectos. *McGraw-Hill*: Ciudad de México, México. 2014, 168-175.
9. Hernández, H. A.; Hernández, V. A.; Hernández, S. A. Formulación y evaluación de proyectos. *Thompson*: Ciudad de México, México. 2005, pp. 4-25.
10. Robinson, T. R.; Van Greuning, H.; Henry, E.; Broihahn, M. A. International Financial Statement Analysis. *CFA Institute*: New Jersey, United States of America. 2009, p. 351.
11. Kaplan, R.; Norton, D. The Balanced Scorecard: Translating Strategy into Action. 1st Edn. *Harvard Business School Press*: Boston, United States of America. 1996, pp. 1-20.
12. Frigo, M. Strategy and the balanced scorecard (Strategic Management). *Strategic Finance*. 2002; 84, pp. 6-9.
13. Khalad, M. A.; Md-Yusuf, M. Comparison between Financial Ratios Analysis and Balanced Scorecard. *American Journal of Economics and Business Administration*. 2011; 3 (4), pp. 618-622.
14. Weygandt, J.J.; Kimmel, P.D.; Kieso, D.E. Managerial Accounting. Tools for Business Decision Making (6th ed.). *John Wiley & Sons*: New Jersey, United States of America. 2014, p. 21.
15. Kaplan, R. The Evolution of Management Accounting. *Accounting Review*. 1984; Vol. LIX, No. 3, pp. 390-418.
16. De Fuentes, P. Los indicadores no financieros en la gestión de calidad total del área de operaciones. *Revista Española de Financiación y Contabilidad* 1966; 25(89), pp. 937-960.
17. Ittner, C.; Larcker, D. Innovations in performance measurement. *Journal of Management Accounting Research*. 1998, 10, pp. 205-238.
18. Andronic, B. Performanța firmei. Abordare transdisciplinară în analiza microeconomică. *Editura Polirom*: Iași, România. 2000, pp. 35-72.
19. Bărbuță-Mișu, N. Finanțarea și performanța întreprinderii. *Editura didactică și pedagogică*: București, România. 2009, p. 197.
20. Ișfănescu, A.; Robu, V.; Anghel, I. Evaluarea întreprinderii, *Tribuna Economică*: București, România. 2001, pp. 13-135.
21. Buse, L.; Styefan, I. Study on the Correlation between Economic and Financial Performance and Stock Exchange Performance in Romanian Companies from Oil and Retail Trade Industries. *Procedia Economics and Finance*. 2014, 16, pp. 149-159.
22. Siminică, M.; Cîrciumaru, D.; Cârșina, S.; Sichigea, M. Impactul performanțelor economico-financiare asupra performanțelor bursiere ale companiilor din industria prelucrătoare listate la BVB. *Economica*. 2017, 2 (100), pp. 108-115.
23. Atrill, P. Financial Management for decision makers. (9 ed.). *Pearson Education*: electronic. 2020, p. 90.
24. Gibson, C. H. Financial Reporting & Analysis. Using Financial Accounting Information. *South-Western, Cengage Learning*: Norwalk, United States of America. 2013, pp. 199-212.

25. Martínez, E. Finanzas para directivos (2 ed.). *McGraw- Hill*: Madrid, España. 2013, pp. 217-243.
26. Brentani, C. Portfolio Management in Practice. A volume in Essential Capital Markets. *Elsevier Butterworth-Heinemann*: London, United Kingdom. 2004, pp. 33-51.
27. Sunardi, S.; Amin, M. Fraud detection of financial statement by using fraud diamond perspective. *International Journal of Development and Sustainability*. 2018, 7, pp. 878-891.
28. Foster, G. Financial Statement Analysis. *Dorling Kindersley*: Delhi, India. 1986, pp. 57-175.
29. Gitman, L. J.; Zutter, C. J. Principios de administración financiera (12 ed.). *Pearson Educación*: Naucalpan de Juárez, México. 2012, p. 288.
30. Hindmarch, A.; Atchison, M. M. Accounting: an introduction. *The Macmillan Press LTD.*: London, United Kingdom. 1977, p. 228.
31. Ohlson, J. A. Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research*. 1980, 18(1), pp. 109-131.
32. Altman, E. Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*. 1968, 589-609.
33. Altman, E. Predicting Railroad Bankruptcies in America. *The Bell Journal of Economics and Management Science*. 1973, pp. 184-211.
34. Altman, E.; Hotchkiss, E. Corporate Financial Distress and Bankruptcy: Predict and Avoid Bankruptcy, Analyze and Invest in Distressed Debt. *John Wiley & Sons*: New Jersey, United States of America. 2005, pp. 231-264.
35. Altman, E.; Loris, B. A Financial Early Warning System for Over-the-Counter Broker Dealers. *The Journal of Finance*. 1976; pp. 184-211.
36. Altman, E.; Haldeman, R.; Narayanan, P. ZETA Analysis: A New Model to Identify Bankruptcy Risk of Corporations. *Journal of Banking & Finance*. 1977; pp. 29-54.
37. Ortiz, H. Análisis financiero aplicado y Normas Internacionales de Información Financiera–NIIF (15° ed.). *Universidad Externado de Colombia*: Bogotá, Colombia: 2015, pp. 337-399.
38. Ishibashi, K.; Iwasaki, T.; Otomasa, S. Y. Model selection for financial statement analysis: Variable selection with data mining technique. *Procedia Computer Science*. 2016, 96, pp. 1681-1690.
39. Lev, B. Financial Statement Analysis: A New Approach. *Prentice-Hall*: New Jersey, United States of America. 1974, pp. 38-74.
40. Bonsón, E.; Cortijo, V.; Flores, F. Análisis de estados financieros. Fundamentos teóricos y casos prácticos. *Pearson Educación*: Madrid, España. 2009, pp. 209-226.
41. Lusztig, P.; Schwab, B. Managerial Finance in a Canadian Setting. *Butterworth-Heinemann*: Toronto, Canada. 1988, pp. 57-93.
42. Wild, J. J.; Subramanyam, K. R.; Halsey, R. F. Análisis de estados financieros. *McGraw-Hill*: Ciudad de México, México. 2007, pp. 498-550.
43. Carrasco, C.; Pallerola, J. Gestión financiera. *Ra-Ma*: Madrid, España 2014, pp. 354-465.
44. Wruck, K. H. Financial Distress, Reorganization and Organizational Efficiency. *Journal of Financial Economics*. 1990, 27, pp. 419-444.
45. Whitaker, R. B. The Early Stages of Financial Distress. *Journal of Economics and Finance*. 1999; 123-133.
46. Fitzpatrick, P. J. A Comparison of Ratios of Successful Industrial Enterprises with those of Failed Firms. *Certified Public Accountant*. 1932, 6, pp. 598-731.
47. Winakor, A.; Smith, R. Changes in Financial Structure of Unsuccessful Industrial Companies. University of Illinois: *Bureau of Business Research, Bulletin No. 51*. 1935, pp. 3-44.
48. Merwin, C.L. Financing Small Corporations in Five Manufacturing Industries, 1926-36. A Dissertation in Economics. *National Bureau of Economics Research*: New York. United States of America. 1942, pp. 31-120.
49. Uğurlu, M.; Aksoy, H. Prediction of Corporate Financial Distress in an Emerging Market: The Case of Turkey. *Cross Cultural Management. An International Journal* 2006, 13(4), pp. 277-295.
50. Beaver, W. H. Financial Ratios as Predictors of Failure, Empirical Research in Accounting: Selected Studies. *Journal of Accounting Research* 1966, 5, pp. 71-111.
51. De Llano, P.; Rodríguez, M.; Piñeiro, C. Bankruptcy Prediction Models in Galician companies. Application of Parametric Methodologies and Artificial Intelligence. *International Conference on Applied Business & Economics (ICABE)*: A Coruña, España. 2010, pp. 117-136.
52. Piñeiro, C.; de Llano, P.; Rodríguez, M. Fracaso empresarial y auditoría de cuentas. *XXV Congreso de AEDEM*: Valencia: España. 2011, pp. 1-6.

Citation: Lica, T. -V. Stadiul actual al cunoașterii în domeniul analizei performanței financiare. *Journal of Social Sciences* 2022, 5 (3), pp. 132-143. [https://doi.org/10.52326/jss.utm.2022.5\(3\).10](https://doi.org/10.52326/jss.utm.2022.5(3).10).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).11](https://doi.org/10.52326/jss.utm.2022.5(3).11)
UDC 343.72:004.738.5(669)



CONNECTION TO THE USE OF FREE ANDROID APPS IN KEBBI STATE, NIGERIA

Zauwali Sabitu Paki^{1*}, ORCID: 0000-0002-3150-6982,
Shamsu Sani², ORCID: 0000-0001-6099-405X,
Gambo Isah Diri², ORCID: 0000-0003-0333-5909

¹Yusuf Maitama Sule University, 800001, Kano, Nigeria

²Kebbi State Polytechnic Dakingari, 860001, Kebbi, Nigeria

*Corresponding author: Zauwali Sabitu Paki, zspaki@yumsuk.edu.ng

Received: 06. 27. 2022

Accepted: 08. 14. 2022

Abstract. In this paper, we studied scamming emanating from the use of free Android apps by conducting an online survey with respondents recruited from four tertiary institutions in Kebbi State, Nigeria. We found that the apps used for communication, such as Facebook and WhatsApp, have the highest number of users. Also, 55.26 % of users reported receiving scam messages that could be linked to their use of free apps, whereas 32.45 % of them were indeed defrauded by scammers. The study concludes that the free social media apps coupled with the characteristic of the users' login credentials could be responsible for the high rate of scam messages that the respondents receive regularly.

Keywords: *Scamming, respondents, privacy-sensitive data, authentication, users, android operating system, security updates.*

Rezumat. În această lucrare a fost studiată înșelăciunea care provine din utilizarea aplicațiilor Android gratuite, realizând un sondaj online cu respondenți recrutați din patru instituții terțiare din statul Kebbi, Nigeria. Am descoperit că aplicațiile folosite pentru comunicare, precum Facebook și WhatsApp, au cel mai mare număr de utilizatori. De asemenea, 55,26 % dintre utilizatori au raportat că au primit mesaje înșelătorești care ar putea fi legate de utilizarea aplicațiilor gratuite, în timp ce 32,45 % dintre aceștia au fost într-adevăr fraudăți de escroci. Studiul concluzionează că aplicațiile gratuite de social media, cuplate cu caracteristicile acreditărilor de conectare ale utilizatorilor ar putea fi responsabile pentru rata mare de mesaje înșelătorești pe care respondenții le primesc în mod regulat.

Cuvinte cheie: *Înșelătorie, respondenți, date sensibile la confidențialitate, autentificare, utilizatori, sistem de operare Android, actualizări de securitate.*

1. Introduction

The rapid growth in mobile technology adoption gives rise to new mobile marketing and advertisement opportunities [1]. The opportunities range from real-time customer involvement and increased revenues for marketers and advertisers. The level of massive worldwide surveillance is increasing day in and day out. We normally leave traces that can

be objectively and systematically recorded each time we use the internet on our smart devices on the visible or invisible web. These recordings can be for economic or security gains. On the invisible web, things like pixels, cookies, "I like" buttons, and so on websites could potentially be used to track and profile all users. The web browsers that we use are unique and can be tracked. For example, as [2] succinctly put:

- Foursquare knows where you are.
- Flickr knows what you are watching.
- Facebook knows what you are doing.
- LinkedIn knows where and with whom you are working.
- Twitter knows what you are saying.
- Amazon knows what you are buying.
- Google knows what you are thinking.

And many more...

This situation can lead to abuse. The key issue is that our citizens can be tracked throughout the world, compromising the security of our tools, especially with some android permissions [2]. One serious source of concern is the possibility of establishing a linkage between pieces of information like metro cards, debit cards, cellphone data, and their subjects.

Metadata aggregated over a person's life tells a story about you. The story is made of facts, but that's not necessarily true.

In our daily life, smart devices are our companions; they are very useful, always connected, and easy to customize. But these devices concentrate personal information (PI) when we use them: phone calls, short message system (SMS), web, applications, etc. Facilities such as global positioning systems (GPS), near field communication (NFC), WiFi, camera, fingerprint sensor, and heart rate sensors generate personal information. So, smartphone knows a lot of our cyber-activities on the internet and our centers of interest through the list of installed applications.

Some actors are interested in people's wealth of personal information for economic/financial or security gains. This is an ecosystem that centers around Advertising & Analytics (A&A) companies. They serve as an interface between developers, users, and advertisers. Through applications, A&A companies collect PI (e.g., geolocation and technical identifiers), create, and incrementally improve the accuracy of user profiles. From these user profiles, they launch Real-Time Bidding (RTB) informing those that might be interested in those profiles and consequently send and display targeted advertisements with those applications. A&A companies get a lot of revenue from targeted advertising. For example, Alphabet Inc (owner of Google) said that it earned \$ 22.7 billion from advertising [3,4].

This situation is even more worrisome with the improvement in technology in recent times. Things like smartphone payment, wearable connected objects, home connected appliances, connected cars, IoT, etc.

The situation can lead to encroaching on the security and privacy of users. For example, in June 2016, the Federal Trade Commission of the USA fined InMobi (a Singapore-based mobile advertising company) \$950,000 for tracking several millions of customers including children without their consent [5]. Our people are likely unaware of this situation. There is a need to create awareness about how best to use these devices.

Android operating system is the most popular and highly used operating system (OS) [2,6,7] with active over 2.5 billion users in over 190 countries [8]. Android operating system

comes with permissions systems that give controls to the users [7] to decide whether or not to grant permission needed by an app. Installing Android apps means the user accepts the apps' permissions for their running [2].

On the privacy-sensitive permission, [2] researched the use of ACCESS_WIFI_STATE permission by the popular applications on the Google Play Store. The authors conducted static and dynamic analyzes and discovered that this permission is being used to collect and transmit Personally Identifiable Information (PII) to third-party companies to track and send targeted advertisements. By conducting a survey, the authors also discovered that the majority of users largely underestimated the power of this permission. In the same vein, Ryan, *et al.* [9] conducted research on the use of permissions in ad libraries and discovered that they checked for permissions beyond those listed as required and those listed in their documentation. These included even highly privacy-sensitive and dangerous ones like CAMERA, WRITE CALENDAR and WRITE CONTACTS. The authors found that users can be tracked via the use of those ad libraries. Analysis conducted by [7] about the usage of the Android permissions system revealed indicated an increment of 73.33% which may mean an increase in users' tracking and disclosure of their sensitive data.

Users' awareness of the sensitivity and implication of some Android permissions will help minimize the potential dangers that they might be exposed to. [6] conducted a massive online survey to determine the level of users' awareness of the Android permissions system. The results of the survey indicated a weak level of awareness concerning the privacy of users' data. [10] conducted a controlled online experiment on Android phone users about their perception and awareness of ad libraries and permissions. The authors discovered that improving their level of awareness changed their perceptions and how they make better decisions on their privacy when installing Android apps. [11] built a knowledge base mapping between API calls and fine-grained privacy-related behaviors. They developed an application that enabled Android users to make informed decisions about their privacy when installing an Android application. The authors used the feedback generated from the users of this app and discovered that increasing the users' level of awareness greatly helped them in making wise decisions when installing Android applications.

Therefore, we aim to investigate the following: (1) the rate of scamming (2) the kind of free apps that are mostly used by our people, and (3) peoples' level of awareness about the android permission system. We have the following specific objectives: (1) to determine the type of free applications the targeted users use frequently and (2) to assess the level of people's knowledge about apps authorizations/permissions to access key elements on their phones and the associated implications (3) to ascertain the number of people defrauded due to scamming

2. Materials and Methods

We conducted a 3-month online survey to get data from the targeted respondents by creating a google form available at <https://forms.gle/fGcU4UNzfPVdhhAGA>. The period of the questionnaire was between March 1 and May 20, 2022. A total of 114 respondents volunteered and filled the online questionnaire out of which 91 (79.80%) were males and 23 (20.20%) were females. The respondents were staff and students of 4 high institutions in Kebbi State, Nigeria. The institutions are Federal University Birnin Kebbi (FUB), Kebbi State University of Science and Technology, Aleiro (KSUST), Waziri Umaru Polytechnic Birnin Kebbi (WUPB), and Kebbi State Polytechnic Dakin-Gari (KSPOL). We shared the link to the form via WhatsApp forums of these institutions and members used the link to submit their responses.

3. Results

An online survey questionnaire was administered to the staff and students of six high institutions in Kebbi state, Nigeria. The following subsections present the results of the survey. Figure 1 shows the number of respondents from the selected institutions.

3.1 Distribution of respondents based on their institution

Figure 1 gives the distribution of respondents according to their institutions.

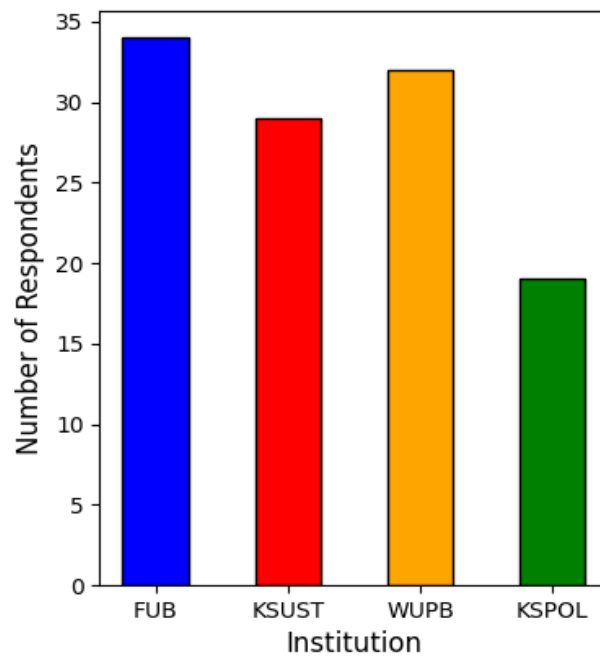


Figure 1. Number of respondents from the selected high institutions.

The recruitment process of the respondents was done by sharing a link to the online questionnaire on the WhatsApp platforms of the selected institutions. We solicited for volunteers to fill out the questionnaire and, as can be seen from Figure 1, we got volunteers from all 4 selected institutions. Federal University Birnin-Kebbi (FUB) had 34 (29.80%) respondents, being the highest, followed by Waziru Umaru Polytechnic Birnin-Kebbi (WUPB) with 32 (28.10%) respondents, then Kebbi State University of Science and Technology (KSUST) with 29 (25.40%), and lastly the Kebbi State Polytechnic with 19 (16.70%) respondents. It is not surprising to have more volunteers from FUB and WUPB than from KSUST and KSPOL as FUB and WUPB have large populations than KSUST and KSPOL.

More so, we chose these institutions because of their heterogeneous nature. FUB and WUPB are federal institutions and hence have staff and students from all parts of Nigeria. KSUST and KSPOL are Kebbi State-owned institutions with staff and students from every nook and cranny of the State

3.2 Major categories of apps most frequently used

We categorize the apps most frequently used by the respondents into 4 categories. The four categories are shown in Figure 1 with the percentage of respondents using them.

The majority of android apps on the Google Play Store fall under one of the categories presented in Figure 2.

The survey reveals that respondents use communication apps more than apps in other categories (approximately 72.2% of the respondents).

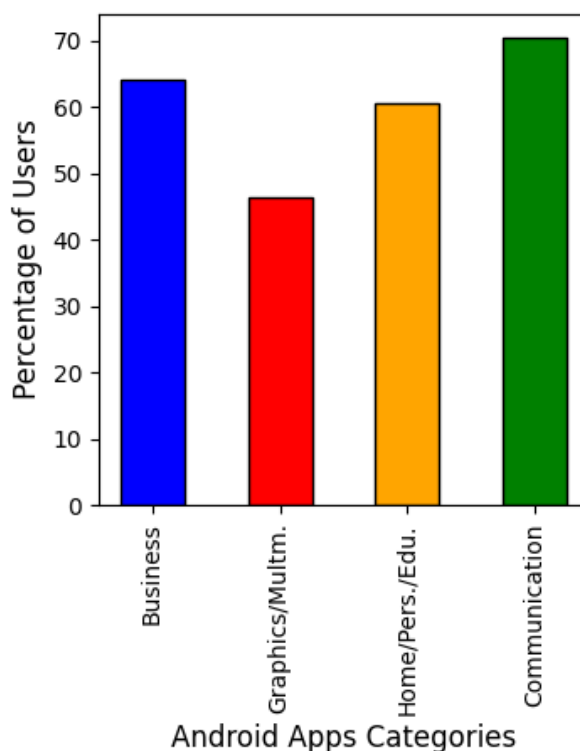


Figure 2. Broad categories of apps and the percentage of respondents using them.

These are apps such as Facebook, WhatsApp, and Instagram. They are used to communicate and create social links and collaborations between friends, colleagues, associates, and members of a community. Sadly, social media apps are leveraged by malicious persons to lure and steal the personal identity of innocent people [12]. The rate of scamming attempts experienced by the respondents may not be unconnected to their use of social media apps like Facebook [13] and dating apps, WhatsApp, and so on. Research conducted by [14] revealed that victims of scamming via social media and online dating apps lose huge amounts of money in addition to the psychological trauma inflicted on them. We can rightly say, as shown by other works, that some social media apps are used as a tool for scamming people by malicious people.

The business apps category is next with approximately 64.04% of respondents using them. Apps in this category include banking and online shopping apps (e.g., Amazon, Jumia).

However, the Home/Personal/Education apps category comprises apps for games, tutorials, etc. We found that about 60.53% of the respondents use them.

3.3 Android versions used by respondents

Here, all respondents using Android version 5 and older are put in one category because they are considered outdated by Google [15]. This is shown in Table 1 below.

Table 1

Android versions and the number of respondents using them		
Version	Number of users	Percentage
Android 13	04	03.51
Android 12	08	07.02
Android 11	12	10.53
Android 10	25	21.93

Continuation Table 1

Pie (version 9)	10	08.77
Oreo (versions 8.0 & 8.1)	10	08.77
Nougat (version 7)	03	02.63
Marshmallow (version 6)	07	06.14
Version 5.0 and older	35	30.70

3.4 Nature of access controls used by respondents

We studied the characteristics of access credentials that respondents used to secure access to their phones and installed apps. Note that the security of electronic gadgets such as smartphones lies in the strength of access control credentials used. We have, therefore, studied some aspects that could either strengthen or weaken the amount of security that access credential provides.

On this note, we found that 50.4% of the respondents use part of their phone number (like the first or last 4 digits. See figure 3) as their PIN to unlock their phones and only 44.6% of them regularly change their PINs (e.g., every 3 months as suggested by security experts).

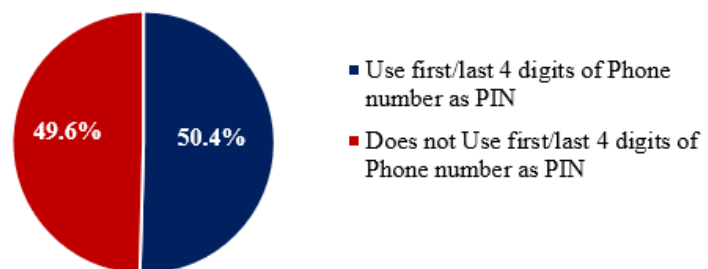


Figure 3. Use of part of a phone number as PIN by respondents.

3.5 Characteristics of access credentials of respondents for frequently used Apps

On the use of a single login credential for all the commonly used apps by the respondents (e.g., banking apps, Facebook, email, etc.), we found that 48.7% use the same login details across all apps they use. Also, 38.1% of them use the names of their family members (such as child, wife, or husband name) as their login details to those apps. More so, on increasing the robustness of a password by making it contain letters, digits, and special characters; only 51.3% do that while the remaining 48.7% either do not comply with this requirement or comply only when it is mandatory.

On the size of their PIN/passwords and how they keep them safe, figures 4 and 5 summarize the result.

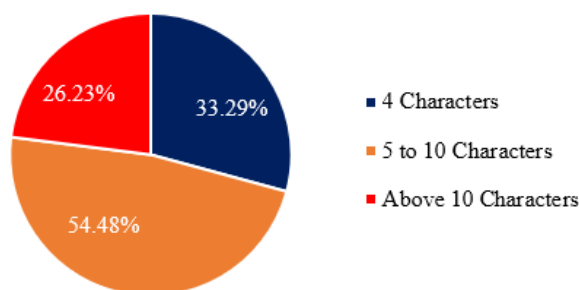


Figure 4. Sizes of PIN/password of respondents.

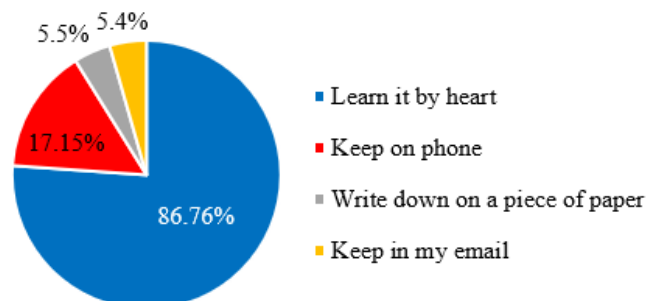


Figure 5. How do users keep safe their login details.

From figure 5, we can see that 28.4% of respondents resort to weaker means of keeping their login credentials by writing them on a piece of paper, saving on the phone, or keeping them on their email.

3.6 Android pattern lock system

The level of security that a pattern lock system provides depends on the complexity of the user's pattern. This directly affects the ease/difficulty with which it can be deduced or learned by a scammer. Complex patterns drawn with lines crossing each other are likely to be more secure and robust to shoulder attacks than simple ones; probably just creating a simple linear line. We found that 53.51% of respondents that use pattern locks on their phones use simple patterns forming lines that do not cross each other.

However, the Android pattern lock system requires a user to use at least 3 points/dots when creating a pattern. Table 2 summarizes the distribution of the number of dots used by respondents.

Table 2

Distribution of dots used by respondents in creating Android pattern lock		
Number of Dots Used	Number of Users	Percentage
3	31	27.19
4	24	21.05
5	10	08.77
6	19	16.67
7	6	05.26
8	6	05.26
9	18	15.79

3.7 Attempts to defraud users via SMS and apps ads

A large percentage (55.26%) of respondents confirmed that they receive unsolicited SMSs and targeted ads via the free apps they have installed on their Android phones. It is worthy of note that we discovered that scammers attempted to defraud approximately 85% of the respondents. More worrisome is the fact that 32.45% were indeed tricked and defrauded.

3.8 Respondents' knowledge about Android permission system

We discovered that 69.30% of the respondents have a vague idea about the Android permission system. They do not know the technical detail and the rationale behind it; they only believe it is a requirement that must be fulfilled when installing/using some apps. The remaining 30.7% do not at all know anything about it. More so, 42.1% of them do not even care to read through permission request message that pops up when installing/using apps. They just grant the requested permission without reading it.

3.9 Respondents' perception of free Android apps

About 65% of the respondents believe that free Android apps are created to help people only or to help people and make money. This is shown in table 3 below.

Table 3

Respondents' perception of free Android apps		
Reason for free Android apps	Number of respondents	Percentage
To help people only	21	18.42
To help people but also to make money	52	45.61
To trick and defraud people	07	06.14

Continuation Table 3

For fun/hobby	13	11.40
Not sure	16	14.04
Undecided	05	04.39

3.10 Respondents' perception of Android permission system

About 88% of the respondents believe that the Android permissions system is just a requirement by some apps before they can be installed.

3.11 Regular updating of Android system

Updating the Android system regularly is highly recommended to make a phone up to date and secure. Google releases patches and security updates regularly. Many phones receive notifications about the release while others (especially those running older versions of Android OS) do not. In this case, users must manually check, download, and install them. This survey found that 31.8% of respondents do not update their phones regularly. This puts them at risk of many threats.

4. Discussion

We can see from Figure 2 that all Android apps can fall into one for categories. The Communication category (all social media apps fall under this category) has the highest number of users. This could be one of the reasons for the high rate of scamming attempts experienced by the majority of the respondents. Social media apps have gained wider acceptance in recent years as they serve as the quickest and fastest medium for cheaper means of communication and dissemination of information. On the other hand, they are being used by cybercriminals to carry out their illicit activities. This means a user of these apps needs to be wary of cyber criminals and take necessary measures to protect themselves. One of these measures is the use of strong and unbreakable login credentials [16,17]. In this regard, we can see that 50.4% (Figure 3) of the respondents that took part in the survey used part of their phone number as their PIN as shown in figure 3. This is a weak security/privacy policy. If their phone numbers are known, access to their phones and the installed apps might be successful by a criminal. This indicates that their level of awareness is low. This can result in the theft of sensitive data, like contacts [18].

Android system provides some layer of protection to the user by detecting and exposing suspicious apps to the user. This largely depends on the version of the Android system running on the user's phone. Phones that run the recent version of the Android system receive updates and bug fix notifications regularly. Phones that run older versions of the Android system may not receive updates and, therefore, their security is not guaranteed. We have seen a non-negligible percentage of users using the outdated Android operating systems (30.7% from Table 1). The security of these phones cannot be assured as they cannot receive updates from Google. Google indicated that it cannot guarantee the security of outdated Android OSes [15].

The android permission system is meant to accord some level of security control to the phone user. It mandates that any app that intends to access some part of the user's phone (like contacts, gallery, etc.) declare that in the app's manifest file [19]. This requirement is enforced by the Android OS during app installation. It permits the user to review the requirements of an app before installing it. In this respect, the majority of the respondents have a very vague idea about the Android permissions system and believe that it is a mere requirement that needs to be fulfilled when installing some apps (see subsection 3.8). This

means that they cannot adequately comprehend and make an informed decision about handling app permission requests.

On the attitude of the respondents towards keeping their phones up to date, it is a bit impressive that 68.2 % of the respondents regularly update their phones as against the 31.8% that do not. But it is still not enough as it is expected that all Android users keep their phones up to date to minimize the risk of malicious apps. So, regular checking for updates and security patches, and installing them on the users' phones is a recommended practice [20].

However, their attitude to how they protect their login detail, we can see from Figure 5 that about 86.76% of them try to memorize their login details. This is impressive. But this is not enough considering the fact a reasonable percentage of them resort to using weak authentication credentials, as highlighted by subsections 3.4 and 3.5. Two-factor scheme gives additional layer of security [21] and helps in cubing scamming attempts by ensuring only an authorized person is able to make any changes to the login detail of a given app.

Android pattern locking system is another mechanism used by the Android OS to provide secure access to smartphones. From Table 2, we can see that 51.76% of the respondents used a pattern that was formed using 5 or more dots out of the 9 dots available. The use of 5 or more dots can help in creating complicated patterns that can avert smudge [22] and shoulder attacks.

More so, we found that more than half of the respondents were lured by scammers whereas a great number of them were indeed defrauded.

5. Conclusions

We would like to conclude by providing the following recommendations: 1) Users need to be careful about the free apps they install on their phones. They should only download and install verified and trusted apps from the Google Play Store. 2) Users should carefully read and analyze the permission request messages that pop up from those apps when installing them. Blindly granting permissions to an app by the users may amount to accessing users' data and could lead to users' privacy leaks. 3) Users should not tap or click on any links that pop up in those free apps that look suspicious or from an unknown source. 4) Users should activate the two-factor authentication option on all apps that have it so that they will be promptly notified of any attempts to modify login parameters on those apps. Especially in apps used to perform financial transactions, two-factor authentication will enable the users to receive a one-time password that is valid for a short time and this adds a layer of security. 5) Users should always use strong passwords comprising both upper- and lower-case letters, special characters, and at least 8-character long. Users should avoid any of their previously used passwords, and update them frequently not use part of their login name as a password. 6) Users should regularly be downloading updates and bug fixes so that they run the latest and secure version of the android system. 7) Users should be switching off their mobile data whenever they are not using it. 8) Users should avoid keeping their phone geolocation always on to obfuscate attempts to record their location for tracking. 9) Users should not respond to any unsolicited messages received on their phones via those free apps. 10) There is a need for greater and wider user awareness campaigns on how best to select and set login details in our society by the Nigerian government.

Acknowledgments. This work was supported by the Tertiary Education Trust Fund (TETFund) via the Institution Based Research (IBR) 2021 for Kebbi State Polytechnic Dakingari.

Conflicts of Interest. The authors declare no conflict of interest.

References

1. Deng, L.; Gao, J.; Vuppapapati, C. Building a Big Data Analytics Service Framework for Mobile Advertising and Marketing. In *Proceedings of the 2015 IEEE First International Conference on Big Data Computing Service and Applications*, Redwood City, USA, 2015; pp. 256 - 266.
2. Achara, J.P.; Cunche, M.; Roca, V.; Francillon, A. WifiLeaks: Underestimated Privacy Implications of the ACCESS_WIFI_STATE Android Permission. In *Proceedings of the 2014 ACM conference on Security and Privacy in wireless & mobile networks*, Oxford United Kindom, 2014.
3. Alphabet. Alphabet Announces Second Quarter 2017 Results. 2017.
4. ZDNet. Quarterly: Alphabet's Turnover up 21% Despite EU fine. Available online: <https://www.zdnet.fr/actualites/trimestriels-le-ca-d-alphabet-en-hausse-de-21-malgre-l-amende-de-l-ue-39855362.htm> (accessed on 17th August 2021).
5. FTC-USA. Mobile Advertising Network InMobi Settles FTC Charges It Tracked Hundreds of Millions of Consumers' Locations Without Permission. Available online: <https://www.ftc.gov/news-events/press-releases/2016/06/mobile-advertising-network-inmobi-settles-ftc-charges-it-tracked> (accessed on August 10 2021).
6. Alani, M.M. Android Users Privacy Awareness Survey. *International Journal of Interactive Mobile Technologies* 2017, 11.
7. Almomani, I.M.; Khayer, A.A. A Comprehensive Analysis of the Android Permissions System. *IEEE Access* 2020, 8, pp. 216671 - 216688, doi:10.1109/ACCESS.2020.3041432.
8. Curry, D. Android Statistics 2022. Available online: <https://www.businessofapps.com/data/android-statistics> (accessed on 20/05/2022).
9. Ryan, S.; Clint, G.; Jon, C.; Jeremy, E.; Hao, C. Investigating User Privacy in Android Ad Libraries. In *Proceedings of the Workshop on Mobile Security Technologies (MoST)*, 2012; pp. 195-197.
10. Na, W.; Bo, Z.; Bin, L.; Hongxia, J. Investigating effects of control and ads awareness on android users' privacy behaviors and perceptions. In *Proceedings of the 17th international conference on human-computer interaction with mobile devices and services*, Copenhagen, Denmark, August 24–27, 2015, 2015; pp. 373-382.
11. Sanae, R.; Zhiyun, Q.; Morely, M.Z. Appprofiler: A Flexible Method of Exposing Privacy-Related Behavior in Android Applications to End-Users. In *Proceedings of the ACM conference on Data and application security and privacy*, 2013; pp. 221-232.
12. Majeed, A.; Zia, H.; Imran, R.; Saleem, S. Forensic analysis of three social media apps in windows 10. In *Proceedings of the 2015 12th International Conference on High-capacity Optical Networks and Enabling/Emerging Technologies (HONET)*, 2015; pp. 1-5.
13. Patel, P.; Kannoopatti, K.; Shanmugam, B.; Azam, S.; Yeo, K.C. A theoretical review of social media usage by cyber-criminals. In *Proceedings of the 2017 International Conference on Computer Communication and Informatics (ICCCI)*, 2017; pp. 1-6.
14. Coluccia, A.; Pozza, A.; Ferretti, F.; Carabellese, F.; Masti, A.; Gualtieri, G. Online romance scams: relational dynamics and psychological characteristics of the victims and scammers. A scoping review. *Clinical Practice and Epidemiology in Mental Health: CP & EMH* 2020, 16, p. 24.
15. Razaghpahanah, A.; Niaki, A.A.; Vallina-Rodriguez, N.; Sundaresan, S.; Amann, J.; Gill, P. Studying TLS Usage in Android Apps. In *Proceedings of the 13th International Conference on emerging Networking EXperiments and Technologies*, Incheon, Republic of Korea, December 12 - 15, 2017, 2017; pp. 350-362.
16. Ye, B.; Guo, Y.; Zhang, L.; Guo, X. An empirical study of mnemonic password creation tips. *Computers & Security* 2019, 85, pp. 41-50.
17. Shen, C.; Yu, T.; Xu, H.; Yang, G.; Guan, X. User practice in password security: An empirical study of real-life passwords in the wild. *Computers & Security* 2016, 61, pp. 130-141.
18. Yang, Z.; Yang, M.; Zhang, Y.; Gu, G.; Ning, P.; Wang, X.S. Appintent: Analyzing sensitive data transmission in android for privacy leakage detection. In *Proceedings of the Proceedings of the 2013 ACM SIGSAC conference on Computer & communications security*, 2013; pp. 1043-1054.
19. App Manifest Overview. Available online: <https://developer.android.com/guide/topics/manifest/manifest-intro> (accessed on 20/06/2022).
20. Samteladze, N.; Christensen, K. DELTA++: Reducing the Size of Android Application Updates. *IEEE internet computing* 2013, 18, pp. 50-57.
21. Aloul, F.; Zahidi, S.; El-Hajj, W. Two factor authentication using mobile phones. In *Proceedings of the 2009 IEEE/ACS international conference on computer systems and applications*, 2009; pp. 641-644.
22. Aviv, A.J.; Gibson, K.; Mossop, E.; Blaze, M.; Smith, J.M. Smudge attacks on smartphone touch screens. In *Proceedings of the 4th USENIX Workshop on Offensive Technologies (WOOT 10)*, 2010.

Citation: Paki, Z.S.; Sani, S.; Diri, G.I. Connection to the use of free android apps in Kebbi state, Nigeria. *Journal of Social Sciences* 2022, 5 (3), pp. 144-154. [https://doi.org/10.52326/jss.utm.2022.5\(3\).11](https://doi.org/10.52326/jss.utm.2022.5(3).11).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).12](https://doi.org/10.52326/jss.utm.2022.5(3).12)
UDC 78.001.5



THE DILEMMA OF MUSIC INDUSTRY DEVELOPMENT: EXTERNAL FACTORS AND INTERNAL TRENDS

Iurie Badicu*, ORCID: 0000-0002-3290-3832

Academy of Music, Theater and Fine Arts of Moldova, 111 Mateevici street, Chisinau, Republic of Moldova

**Corresponding author: Iurie Badicu, ibadicu.official@gmail.com*

Received: 06.18.2022

Accepted: 08.04.2022

Abstract. This research is motivated by the development of the music industry, in order to obtain new results, through extensive and revolutionary actions to move from the current quality to a new one. The specific hypothesis of the study of the music industry is based on the consideration of the dilemma: although the leaps and interruptions of evolution favor the growth and considerably expand the musical activity, they do not result in a totally new state of quality accompanied by highlighting musical values. Thus, the interpretable cultural result obtained, of the current music industry, is due to a series of external challenges, both solitary distinguished and numerous associated. The study sums up all the challenges, coming from outside the structure of the music industry, to shape the external influence; whose action is reflected in the generation of new internal trends. In this sense, the external influence is the expression, and the internal tendencies are the reflection of this expression. The research used various methods, principles, techniques and scientific procedures combined, and based on the principle of integrity, the author developed his own culturological procedures. At the same time, in the presentation of the material, preference was given to the descriptive method with the application of the elements of comparison, analysis and deduction, as well as the search engine Scopus. The research finds, through the prism of different civilizational paradigms, that the music industry is in the dilemma of its development. In the circumstances of 2022 and for the next period, the author concludes with two directions of development of the music industry that require special research.

Keywords: *the dilemma of the music industry, external factors of the music industry, internal trends of the music industry.*

Rezumat. Această cercetare este motivată de dezvoltarea domeniului industriei muzicale, în vederea obținerii unor rezultate noi, prin acțiuni ample și revoluționare de trecere de la actuala stare calitativă la una nouă. Ipoteza specifică a studiului despre industria muzicală se bazează pe considerentul dilemei: deși salturile și întreruperile evoluției favorizează creșterea structurală a industriei muzicale și extind considerabil funcționalitatea acesteia, ele nu soldează cu o stare totalmente nouă a calității însoțită de evidențierea valorilor muzicale. Astfel, rezultatul cultural interpretabil obținut, al actualei industriei muzicale, se datorează unui șir de provocări externe, atât solitare distinse, cât și numeroase asociate. Studiul

sumează totalitatea provocărilor, venite din afara structurii industriei muzicale și remarcă influența externă, acțiunea căreia este reflectată prin generarea tendințelor interne noi. În contextul cercetării, factorii externi constituie expresia, iar tendințele interne reprezintă reflecția acestei expresii. În cadrul cercetării s-a utilizat diverse metode, principii, tehnici și procedee științifice combinate, iar în baza principiului integrității, s-a dezvoltat viziuni și procedee culturologice proprii. Totodată, la expunerea materialului, s-a acordat preferință metodei descriptive cu aplicarea elementelor de comparație, analiză și deducție, precum și motorului de căutare Scopus. Cercetarea afirmă, prin prisma diferitor paradigme civilizaționale, aflarea industriei muzicale în dilema dezvoltării sale. În circumstanțele anului 2022 și pentru perioada imediat următoare, autorul concluzionează prin două direcții ale dezvoltării industriei muzicale care necesită cercetare ulterioară.

Cuvinte cheie: *dilema industriei muzicale, factori externi ai industriei muzicale, tendințe interne ale industriei muzicale.*

1. Introducere

Fenomenul relației de asociere a devenit evident începând cu anul 2022, când s-a constatat că, industria muzicală a intrat în *dilema identificării sale* și a alegerii unei direcții de dezvoltare. Dificultatea conturării unei soluții pentru „industria muzicală globalizată” [1, pp. 72-75] s-a accentuat în rezultatul următoarelor provocărilor complexe: revoluția digitală (2015), restricțiile pandemice (2019) și ulterior, noua conjunctură militară, politică și economică a războiului din Ucraina (2022). Astfel, pe parcursul a unui deceniu (2012-2022) au intervenit numeroși factori externi, care au influențat industria muzicală și au provocat consecințe asupra *spațiului său tradițional de dezvoltare*. Prin spațiu tradițional, în care funcționează și se dezvoltă industria muzicală, se înțelege spațiul industriei muzicale occidentale, reprezentat de structurile locale ale celor mai performante state în domeniu, cum sunt: SUA, Marea Britanie, Statele membre ale UE, Australia, Japonia, Coreea de Sud și altele [2]. Analiza acestor factori și localizarea lor în cadrul dilemei dezvoltării industriei muzicale, constituie prioritatea acțiunii de cercetare. Așadar, circumstanțele de ordin politic, economic, juridic, social și sanitar au acutizat problema umanitară, precum și critica acesteia.

Actualmente, în literatura de specialitate autohtonă, nu sunt investigate suficient și sub aspect complex provocările relațiilor de asociere asupra industriei muzicale. În acest context, cercetarea de față își propune o investigare, în plan teoretic și pragmatic, a factorilor externi, care au influențat industria muzicală și au provocat consecințe asupra spațiului său tradițional de dezvoltare.

Problemele dezvoltării industriei muzicale, sub aspect general, sunt regăsite în lucrările de cercetare ale unor savanți, precum: Kanellopoulou (2021) [3], Galuszka (2021) [4], Fukuyama (1994, 2009) [5-6], Huntington (2012) [7], Efremov (2006) [8], Wilson (2019) [9], Evola (1999) [10], Guenon (2022) [11], Dașevschii (2017) [12], Toynbee (1997) [13-14] etc.

Importanța și actualitatea cercetării, în acest domeniu, sunt condiționate de revoluția digitală, restricțiile pandemice și ulterior, noua conjunctură militară, politică și economică a războiului din Ucraina, care au sporit abordarea umanistă, culturologică, sociologică, filozofică și civilizațională a industriei muzicale.

Scopul și obiectivele lucrării constă în investigarea multilaterală a aspectelor dezvoltării industriei muzicale și fundamentarea noilor tendințe interne de dezvoltare ale industriei muzicale, odată cu modernizarea unor subcomponente structurale internaționale,

care se amplifică în dependență de relaționarea sa cu instituțiile și organizațiile sociale, economice, politice și culturale asociate industriei muzicale.

Pentru a realiza și a pune în valoare scopul cercetării, au fost stabilite următoarele obiective:

- revizuirea literaturii în vederea identificării nivelului de cercetare științifică și aprecierii performanței științifice în domeniul industriei muzicale;
- sistematizarea și analiza teoriilor și paradigmatelor civilizaționale privind evoluția industriei muzicale globale și argumentarea celor mai fundamentale ce au afectat industria muzicală locală în contextul diverselor provocări;
- specificarea tipurilor de corelație între industria muzicală locală și industria muzicală globală;
- examinarea și specificarea factorilor de influență asupra industriei muzicale;
- formularea concluziilor aferente dilemei identificării industriei muzicale și constatarea direcției de dezvoltare.

Metalingvistic, acest articol este structurat ca urmare a analizei tezelor introductive, conform cărora s-a identificat și interpretat factorii externi de influență asupra industriei muzicale. Totodată, tezele introductive au servit drept criteriu pentru denumirea și gruparea acestor factori. S-a evidențiat tendințele interne noi, atestate în rezultatul influenței externe și s-au trasat concluzii astfel încât, materialul culturologic să fie relevant industriei muzicale, precum și să exercite impact asupra spectrului teoretic al filosofiei și sociologiei culturii, istoriei și teoriei culturii, economiei, managementului artistic public și privat etc.

2. Materiale și Metode

În cadrul metodologiei de cercetare utilizate pentru elucidarea problemelor abordate, au fost studiate și analizate lucrări ale specialiștilor atât din țară, cât și de peste hotare, precum și norme, reglementări din domeniul industriei muzicale. Prezenta lucrare aprofundează abordările dilemei industriei muzicale, cercetată prin prisma diferitor paradigme civilizaționale. În lucrare s-a utilizat metoda de cercetare calitativă, urmărindu-se interpretarea factorilor de influență asupra industriei muzicale. Lucrarea se încadrează în cercetarea fundamentală, care are drept obiectiv elucidarea tendințelor interne noi, atestate în rezultatul influenței externe, iar, pe de altă parte, în cercetare aplicativă, venind în ajutor mediului academic prin exemplificări pragmatice. La expunerea materialului, s-a acordat preferință metodei descriptive cu aplicarea elementelor de comparație, analiză și deducție, precum și motorului de căutare în baza de date bibliografică și bibliometrică în format online Scopus. De asemenea, s-a analizat materiale statistice și datele oficiale ale Global Music Report - Annual State of The Industry /IPFI (2020) [2], dar și Rapoartele Comisiei UE către Parlamentul European, Consiliul și Comitetul Economic și Social [15-16] etc.

3. Revizuirea Literaturii

În vederea identificării cercetărilor științifice la nivel internațional și aprecierii performanței științifice în domeniul industriei muzicale a fost analizată baza de date bibliografică și bibliometrică în format online Scopus. Studiul publicațiilor pe platforma Scopus s-a realizat prin setarea unor criterii ale căutării, astfel, încât să se obțină rezultate relevante pentru cercetare. Primul criteriu, pentru obținerea și examinarea datelor, a fost stabilirea cuvântului-cheie „music industry”, iar cel de-al doilea criteriu a fost determinarea „perioadei: 2012-2021” prin generarea datelor înregistrate în ultimii 10 ani.

În consecință, au fost selectate 105 lucrări științifice, care corespund criteriilor indicate. Aceste date sunt prezentate sun forma unei diagrame, incluse în figura 1.

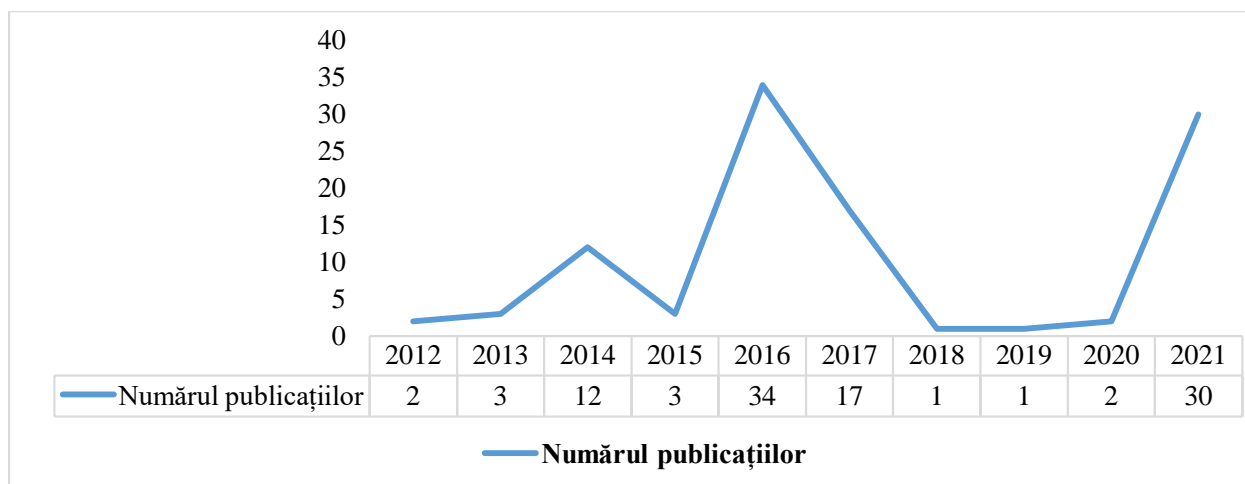


Figura 1. Dinamica publicațiilor privind industria muzicală în anii 2012-2021.

Sursa: elaborat de autor în baza rezultatelor căutării pe Scopus.

Din datele prezentate în figură deducem că, evoluția de la an la an este neuniformă, iar numărul lucrărilor denotă interesul cercetătorilor la nivel internațional. Din punct de vedere cantitativ, cele mai multe publicații au fost elaborate în anul 2016 – 34 de publicații, urmat de anul 2021 cu 30 de publicații.

În funcție de categoria lucrărilor acceptate de Scopus – 77 de lucrări reprezintă capitole în manuale (70,00% Book Chapter), 22 de lucrări constituie manuale (cărți) (21,00% Book), celelalte categorii fiind nesemnificative, figura 2.

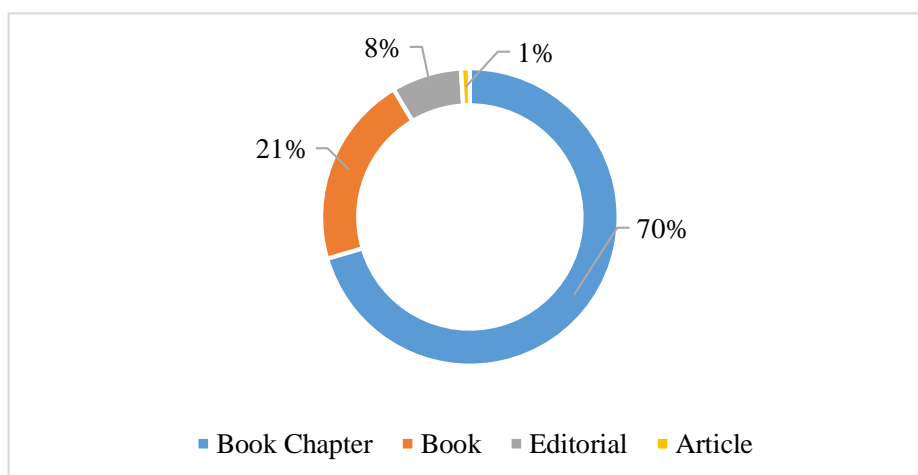


Figura 2. Clasificarea cercetărilor în funcție de categoria lucrărilor.

Sursa: elaborat de autor în baza rezultatelor căutării pe Scopus.

După tipul categoriilor acceptate de Scopus – 40 de lucrări (34,8%) au fost recenzate la categoria „Arts and Humanities”, 39 de lucrări (33,9%) la categoria „Social Sciences”, 19 lucrări (16,5%) – „Business, Management and Accounting” și 17 lucrări (14,8%) la categoria „Economics, Econometrics and Finance”, figura 3.

Problemele abordării industriei muzicale sunt examinate și susținute în lucrările unor savanți. Astfel, *Kanellopoulou E.*, tratează natura industriilor muzicale înainte și după revoluția digitală, din punctul de vedere al consumatorului, analizând modul în care „politica concurenței poate stimula inovația și poate proteja interesele consumatorilor pe piețele muzicale ale viitorului” [3, pp. 42-52].

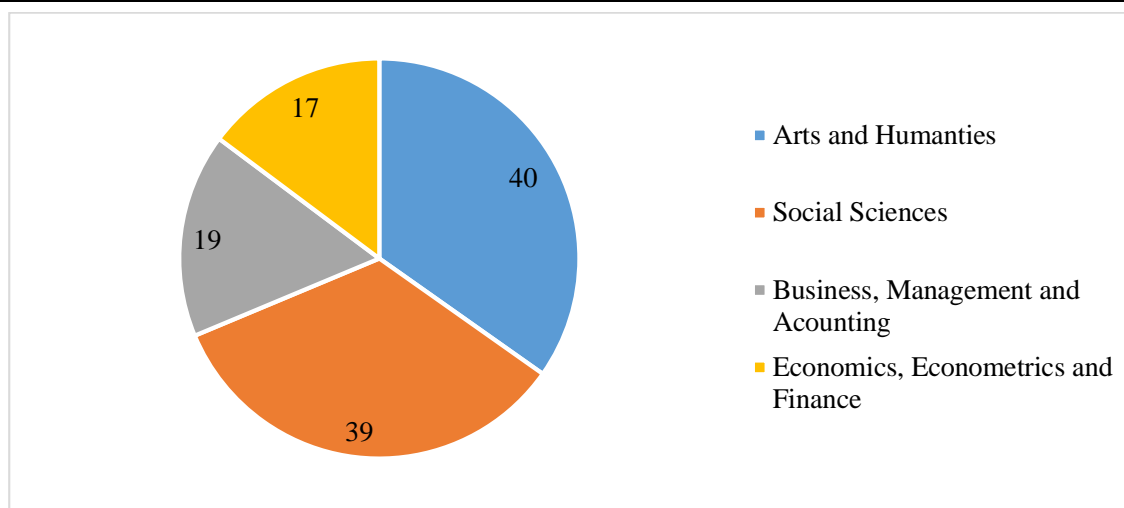


Figura 3. Clasificarea cercetărilor în funcție de tipul și categoria acceptate de Scopus.

Sursa: elaborat de autor în baza rezultatelor căutării pe Scopus.

În ultimii treizeci de ani, Europa de Est a fost un loc de transformări politice, economice și sociale radicale, iar aceste schimbări au afectat industriile muzicale din țările sale. Volumul intitulat „*Eastern European Music Industries and Policies after the Fall of Communism: From State Control to Free Market*”, al unor cercetători internaționali de top, precum: *Pluszynska A., Korzeniewska K., Kube S., Rayzhekiva G., Paoazova J., Barrer P., Barna E., Trifan E., Biasioli M.* și alții, explică și evaluează strategiile folosite de artiști și industrie pentru a intra pe piețele muzicale internaționale, caracteristice perioadei căderii comunismului și examinează „modul în care procesele au afectat scena muzicală, industriile și piețele” [4, pp. 196-206]. Aceste transformări au coincis cu apariția digitalizării și a internetului de rețea, care „a intensificat schimbările și a condus la diverse provocări atât pentru casele de discuri, cât și pentru artiști, materializate prin scăderea vânzărilor de discuri (fizice) și trecerea la tehnologii noi de comunicare” [4, pp. 135-150].

„Varianta globalizată a industriei muzicale” [1, pp. 72-75], cu cele mai multe caractere culturale și economice desăvârșite, este *industria muzicală occidentală*, care atins apogeul său structural-funcțional deoarece: în lanțul său valoric se atestă breșe și disfuncționalități iremediabile. Dilema dezvoltării industriei muzicale s-a tratat prin comparație și similitudine cu teoriile lui *Fukuyama F.*, cuprinse în lucrările „*Sfârșitul lumii și ultimul om*” [5] și „*Încredere: Virtuțile sociale și crearea prosperității*” [6]. Abordările lui *Fukuyama* facilitează disecarea și fragmentarea materialului cercetat încât, s-a constatat că, acele breșe apărute în lanțul valoric al industriei muzicale occidentale constituie și ele expresia „confruntării dintre *logica științei moderne și lupta pentru recunoaștere* care se desfășoară istoric în *patria culturii*” [5, p. 103]. Breșele industriei muzicale sunt provocate de „distanțarea inadmisibilă a *segmentului creativ*, al producerii, față de *segmentul consumatorului final*, din cadrul consumului” [6, pp. 21-29]. La rândul său, disfuncționalitățile structurale, îndeosebi cele de nivel local, pot fi interpretată ca și consecință a influenței externe directe, dar și ca urmare a consecvenței „*acumulării fără de sfârșit*” [5, p. 85]. Totodată, conform teoriilor lui *Fukuyama*, „pentru înțelegerea structurii industriale este crucial să evidențiem gradul de înzestrare cu capital social al unei societăți, implicațiile căruia depășesc sfera economiei” [6, p. 173].

Utilizând paradigma civilizațională a lui *Huntington S.*, evidențiem doi poli importanți: ansamblul de particularități etnice specifice unei culturi muzicale – *etnicitățile* [7], care stau la baza fenomenelor locale ale industriei muzicale și nu depășesc esențial granița statului

luat în parte și – *civilizațiile* [7]. Din șirul civilizațiilor: chineză, japoneză, latino-americană, hindusă, islamică și ortodoxă (rusă), *Huntington* o accentuează pe cea *occidentală*, considerând că aceasta „are interese importante în toate celelalte civilizații sau regiuni, realizează cele mai avansate cercetări tehnice și exercită autoritate morală considerabilă în celelalte societăți” [7, pp. 109-110]. Exercițarea acestei autorități, însoțită de posedare, administrare, control și dominare, generează confruntări civilizaționale sub formă de „conflicte *de falie* și conflicte dintre *state nucleu*” [5, pp. 295-296]. Estimarea culturală a acestor confruntări, precum și a consecințelor, a permis considerarea lor în calitate de *provocare externă majoră* cu impact asupra industriilor muzicale locale. Totodată, constatăm că, abordarea *huntingtoniană* oferă o panoramă clară, atât a lumii per general, cât și a industriei muzicale globalizate, în special. În opinia noastră, aceasta, facilitează distingerea a ceea ce este important de ceea ce nu este important în identificarea direcțiilor și modalităților de dezvoltare a industriei muzicale.

Ca urmare a celor menționate remarcăm „reticența culturii muzicale autohtone în raport cu industria muzicală globalizată” [1, pp. 72-75], drept fiind reflecția expresiei influenței externe, dar și tendință în procesul de reconfigurare a culturii muzicale din lume. Tendința reticenței culturale, de natură socio-dinamică dar autoconservatoare, se manifestată în plină criză a industriei muzicale prin ieșirea din anonimat a *civilizațiilor locale* și devine tot mai importantă, avansând în actualitate. Constatăm că, civilizațiile locale au fost formulate conceptual de mai mulți autori, printre primii însă *Efremov* îi consideră pe *Danilevskii* și *Spingler*, în monografia „*Борьба за историю*” [8]. Reticența culturii locale ia amploare, în special la proximitatea structurală a civilizațiilor – o *altă teză*, esențială și importantă pentru interpretarea specificului industriei muzicale din RM.

Așadar, prin poziționarea sa geografică și nu doar „industria muzicală din Republica Moldova constituie o extremitate a civilizației occidentale, aflată în contact direct cu civilizația rusă (ortodoxă) și în contact îndepărtat cu celelalte civilizații” [1, pp. 72-75]. Deși, după revoluția digitală (2015), industria muzicală globală s-a virtualizat și a eliminat granițele civilizaționale, totuși din șirul contactelor îndepărtate, tangibile și intangibile, contactul cu civilizația islamică rămâne valid. În Republica Moldova acesta se realizează prin relația directă cu mediul cultural din Turcia, dar și prin prezența elementelor culturale islamice ale găgăuzilor ortodocși din UTA Găgăuzia a Republicii Moldova. În contextul abordării dilemei industriei muzicale globale, structura locală a industriei muzicale din Republica Moldova constituie un model excelent pentru cercetare. Rezultatul acestor explorări poate fi considerat reprezentativ și relevant, deoarece exemplifică specificul relației de asociere, prin combinarea a mai multor elemente civilizaționale: *occidental, est-european și autohton* [8]. Astfel, asocierea diferitor elemente civilizaționale are loc în cadrul producerii, iar combinarea se realizează în cadrul distribuirii, precum și a consumului produselor și serviciilor muzicale. Aceste procese se desfășoară pe terenul autohton și potent al Republicii Moldova, care „posedă propria identitate muzicală ce pretinde la competitivitate locală de peste 51%” [17, pp.33-40]. Aspectul sinergiei, asocierii și combinării în mai multe structuri locale, se datorează occidentalizării parțiale a industriilor muzicale ale țărilor, indiferent de poziționarea lor continentală, precum: Federația Rusă, Ucraina, Kazahstan, Azerbaidjan, Turcia, India, statele Americii Latine etc. Fundalul cultural, valoric și religios însă, a statelor menționate, rămâne păstrat împreună cu șansa lor ontologică.

În urma celor menționate, devine cert faptul că, actualul spațiu geografic, transcontinental și transnațional, în care funcționează structura extinsă a industriei muzicale

globale, este unul de natură civilizațională. O civilizație care este deja creată de omenire și definită de *Wilson E.*, drept „civilizația războiului stelelor – cu emoții caracteristice Epocii de Piatră, cu instituții publice specifice Evului Mediu și cu tehnologii avansate destinate Zeilor” [9, pp. 10-11]. Paradigmă civilizațională evidențiază la modul concret elementele și caracterul dilemei noastre: *emoțiile, instituțiile și tehnologiile*. Cu ajutorul acestor trei elemente, ale paradigmei *wilsoniene*, s-a grupat factorii în calitate de componente ale influenței externe. În sensul oportunității, pe lângă teoriile deja menționate, s-a completat șirul tezelor introductive cu abordările complexe ale altor autori, precum: *Evola I., Toymbee A., Spengler O., Eliade M., Danilevskii N., Guenon R., Milton J.*, ș.a. Deși, cercetătorii menționați nu fac referință directă la etapa actuală a industriei muzicale, considerăm conținutul acestor opere fiind actual și relevant, deoarece și „transformarea activității muzicale în industrie a constituit un proces de durată (1850-1950)” [18, p. 60].

Așadar, pentru identificarea soluțiilor în dilema industriei muzicale, operăm cu teoriile lui *Evola*, conform căreia „civilizațiile comunică prin analogie și nu prin continuitate, iar trecerea de la o civilizație la alta, reprezintă în sine o soluție” [10, p. 31]. În acest sens, una din cauzele principale ale crizei industriei muzicale occidentale este „luarea în considerație a componentei materiale și celei tehnologice prin neglijarea componentei spirituale” [18, p. 32]. Drept rezultat certificăm că și produsele și serviciile industriei muzicale gândite și fabricate în serie nu arată ca „o expresie vizibilă a invizibilului, ci apar în față consumatorului ca un caleidoscop” [10, p. 33].

Totodată, asemănător tratării lui *Guenon*, în lucrarea „*Criza lumii moderne*” și în cazul industriei muzicale occidentale, trebuie „să punem lucrurile la punct de la bun început, pentru a evita interpretările echivoce” [11, p. 139]. În aceeași ordine de idei, soluția rezidă în esența problemei; care este, conform teoriilor lui *Guenon*, goana pentru a „reduce calitatea la cantitate” [11, p. 143].

Cercetând industria muzicală în calitate de „constructul industrial, muzical și transnațional care dezvoltă o piață oligopolistică, standardizată și reglementată” [19, pp. 21-29], trasăm cele mai importante aspecte ale reconfigurării normative și financiare, fiind concentrate în portofoliul a trei entități majore: *Universal Music Group* – 33%, *Sony Music Entertainment* – 22% și *Warner Music Group* – 20% [19, pp. 21-29]. Totodată, indicele *Herfindahl Hirschman (IHH)*, care măsoară concentrarea pieței unei industrii, indică valoarea de 2.103, ceea ce denotă „imperfecțiunea pieței industriei muzicale și incorectitudinea în raport cu consumatorul de produse și servicii muzicale” [19, pp. 21-29]. Relația asociată tehnosocio-culturală este, în primul rând, expresia influenței externe tehnologice, care va fi abordată ulterior, inclusiv intervenția fațetei ingerinței artificiale în segmentul creativ al producerii. Inițial însă, operăm cu tezele lui *Toymbee*, pentru a localiza, dar și a amplifica rolul transformator al *intelligenței* [13] care după noastră constituie „o clasă de agenți de legătură ce cunoaște meșteșugul civilizației și urmează să fie adaptată atât cât este nevoie pentru ca să-i îngăduie propriei lor civilizații, prin intermediul lor, să se încadreze într-un mediu social nou. În acest mediu nou, viața încetează să mai fie trăită conform vechilor tradiții locale și ajunge să fie din ce în ce mai mult trăită conform civilizației în expansiune” [13, p. 526].

4. Rezultate și Discuții

Abordarea influenței externe asupra industriei muzicale, în condițiile anului 2022, cât și pentru perioada imediat următoare, reprezintă o procedură dificilă a cercetării, reieșind din mai multe considerente.

În primul rând, granițele teritoriale ale industriei muzicale globale sunt greu de stabilit, deoarece reprezintă „un business transnațional, gestionat în diferite state cu cadru normativ diferit, cu grad de industrializare diferit” [1, pp. 72-75] și aparținând diferitor civilizații. Astfel, industriile muzicale ale unor state pot fi centre de influență care elaborează politici, le implementează și reglementează fluxurile financiare, iar alte industrii, ale statelor proximale (satelit) sunt consumatoare de produse standardizate. Ele furnizează materie primă și semifabricate muzicale, mai rar, creează și produc materie muzicală finită. În plus, unele *etnicități* ale unor state mai sunt încă potente pentru industria muzicală și dezvoltă centre de creativitate, altele însă și-au epuizat iremediabil etnicitatea, oprindu-se. În sensul acestui considerent, Wilson susține că „creativitatea este căutarea firească, umană, a originalității care nu trebuie să se oprească niciodată” [9, p.11]. Etimologic, termenul creativitate provine din latinescul „creare” – a naște, a zămisli, a crea, a făuri. Termenul a fost folosit în literatura de specialitate de psihologul american G. Allport, în 1937, – *creativity*, cu sensul de „capacitate de a genera noul, dispoziție generală a personalității” [12, pp. 240-248].

În al doilea rând, industria muzicală este un construct în metamorfoză continuă, care mai produce și distribuie muzică fixată pe suporturi fizice, dar, totodată cunoaște o ascensiune a distribuției digitale și a consumului muzical virtual. În această ordine de idei, este considerat că virtualizarea distribuției muzicale a exaltat și a exacerbat prin lansarea pe piață a *NFT-urilor*¹, fiind noua dimensiune a expresiei artistice a interpreților și a operelor muzicale create de inteligența artificială. Această tendință se atestă și în alte domenii comerciale, de aceea remarcăm că, industria muzicală este influențată de factori comuni și pentru alte industrii performante.

Din șirul considerentelor, cel mai important însă, este – *tipul corelației*, în sensul raportului la care s-a ajuns în cadrul procesului de influență externă, fapt prezentat în figura 4.

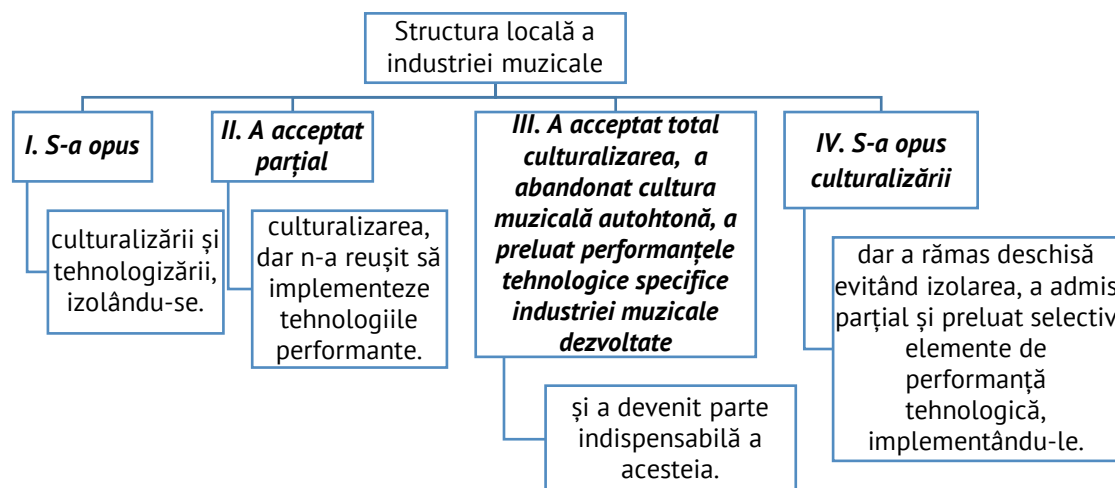


Figura 4. Tipuri de corelație între industria muzicală locală și industria muzicală globală.

Sursa: elaborat de autor în baza rezultatelor cercetării.

Din figura prezentată, derivă că dificultatea cercetării dilemei industriei muzicale globale este elucidată în cadrul a *patru tipuri ale corelației între industria muzicală locală și*

¹ Tehnologie ce funcționează pe baza criptomonedelor (jeton nefungibil), fiind un gen de autograf virtual ce îi permite operei în urma replicării să-și păstreze dovada deținerii originalității. În industria muzicală, pionerii NFT-ului sunt trupa Kings of Leon, care și-a vândut albumul *When You See Face*, iar producătorul de muzică electronică 3LAU a vândut piese în sumă de peste 11 milioane dolari. În România, prin intermediul NFT-urilor, interpreta Delia a vândut primele 100 exemplare a piesei *Racheta*.

industria muzicală globală (I-IV). Cele patru tipuri de corelații le stabilesc și le dezvoltă țările (state solitare sau grupuri de state, uniuni), sub influența *culturalizării* și *tehnologizării*. Spre deosebire de abordările *Toymbee* [13-14] și *Huntington* [7], în această cercetare și pentru perioada de referință a ei, prin culturalizare se presupune acțiunea de răspândire a culturii muzicale occidentale, iar prin tehnologizare se înțelege oferirea caracterului tehnologic și industrial oricărei arte, inclusiv celei muzicale.

Așadar, analiza provocărilor externe și a elementelor care exercită influență directă și indirectă asupra industriei muzicale, precum și abordarea prin prisma considerentelor, dar și a tezelor introductive, a permis identificarea și gruparea constituentelor influenței externe în cadrul a trei factorii importanți: *factorul cultural*, *factorul tehnologic* și *factorul macroeconomic*, fapt prezentat în figura 5.

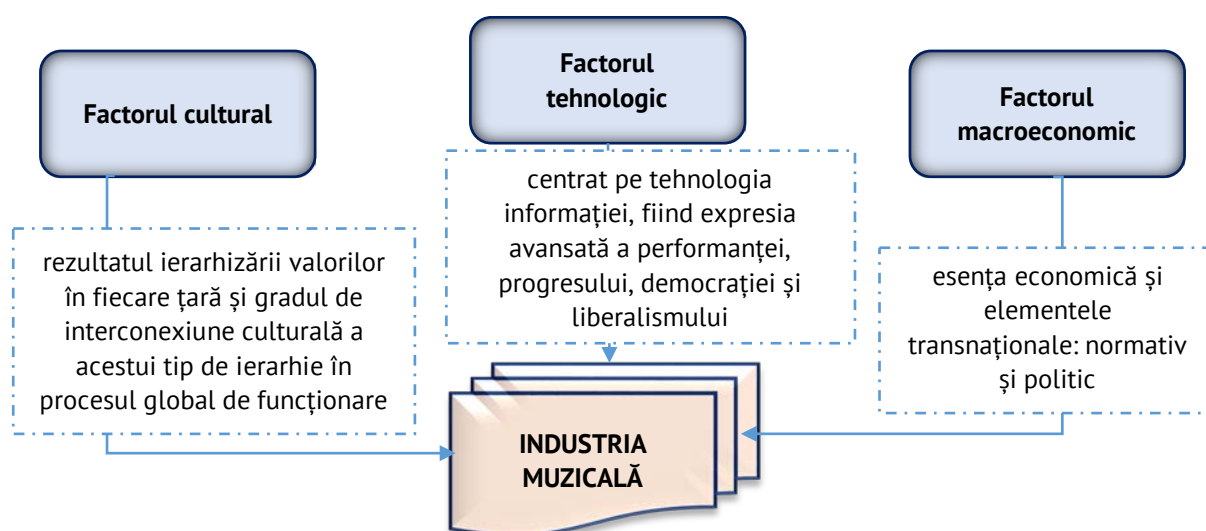


Figura 5. Factori externi de influență asupra industriei muzicale.

Sursa: elaborat de autor.

Factorul cultural presupune atât influența asupra industriei muzicale a rezultatului ierarhizării valorilor în fiecare țară luată în parte, cât și gradul de interconexiune culturală a acestui tip de ierarhie în procesul global de funcționare. În acest sens, „nivelul de libertate și de democratizare în diferite țări, gradul de urbanizare și industrializare a acestora, nivelul de educație și numărul de instituții muzicale, precum și accesul la informația echidistantă sunt nuanțe importante care oferă factorului cultural, caracter civilizațional autohton” [1, pp. 72-75]. Un rol important în maniera de influență a factorului cultural îl are și diferendul interpretării tradiționale sau progresiste a lumii, îndeosebi tratarea activității de creație muzicală prin prisma metafizică. Statele care pot influența piața industriei muzicale globale, structura sau subcomponentele funcționale, sunt cele care:

- posedă tehnologii performante, pe de o parte, și perpetuează propria tradiție muzicală pe de alta parte;
- dezvoltă sisteme educaționale muzicale de performanță;
- favorizează activitatea criticilor și muzicologilor notorii;
- promovează personalități din domeniul muzicii și generează somități culturale;
- dezvoltă atitudine publică, cercetează domeniul și implementează politici culturale muzicale adecvate.

În acest context, influența factorului cultural poate favoriza o poziție dominantă în circuitul global al industriei muzicale sau cel puțin, poate asigura protecția industriei

muzicale autohtone supusă dominării, garantându-i o oarecare autonomie, conservare și perpetuare a valorilor muzicale naționale.

La rândul său, *factorul tehnologic* este centrat pe tehnologia informației, fiind expresia avansată a performanței, progresului, democrației și liberalismului. Actualmente, factorul tehnologic este o metamorfoză tehnologică care s-a poziționat în cadrul industriei muzicale în calitate de instrument social principal de masă. Considerăm că, *naturalizarea socială* a factorului tehnologic, eterogen la prima vedere, a permis utilizarea masivă a instrumentelor sociale de cercetare caracteristice sociumului, precum segmentarea demografică, abordarea conduitei psiho-sociale etc., în scopul creșterii profitabilității entităților beneficiare. Astfel, într-o societate urbană, ascultarea muzicii are loc în mijloacele de transport, în birouri la calculator sau la domiciliu prin căști conectate la telefonul mobil. Factorul tehnologic intervine eficient și în dependență de perioada zilei în care sociumul simte nevoia de a asculta muzică: dimineața la o cafea, la prânz la serviciu, seara în dormitor sau după miezul nopții în club. Contează la fel și statutul social ori starea amoroasă a ascultătorului. În acest sens, menționăm că diferiți consumatori au așteptări diferite de la serviciile și produsele muzicale: unii simt nevoia distracției, alții necesitatea comunicării, iar ceilalți își doresc muzică pentru ambianță. În rezultatul acestei influențe externe, ca și impact, produsele muzicale pot motiva sau pot lăsa indiferent ascultătorul. Ponderea ascultătorului de muzică din totalitatea consumatorilor de produse și servicii artistice este diferită în diferite circumstanțe sociale și tehnologice, precum și în diferite zone civilizațional-geografice sau state.

În contextul „consumatorului interesat de muzică” [19, pp. 21-29], conform *Nilsen (2017)*, în S.U.A. s-a atestat o pondere a ascultătorului de muzică de cca 95%, iar în Canada de cca 93% [2]. Conform datelor *Levada-Centr (2018)*, în Federația Rusă ascultătorii de muzică reprezintă cca 75%, dintre care o parte considerabilă preferă muzica clasică, tot ei citesc și cărți. Prin contribuția consumatorului final, conform *Global Music Report, Annual State of The Industry /IPFI, (2020)*, veniturile, în urma ascultării și descărcării fișierelor muzicale, au crescut (față de anul 2019): în America Latină, cu cca 15,9%; în Africa, cu cca 8,4%; în Asia, cu cca 9,5%, iar în Australia, cu cca 3,3% [2].

Factorul macroeconomic, pe lângă esența economică, comportă în sine alte două elemente transnaționale: normativ și politic, elemente care și-au pierdut calitatea de factor extern independent. Asemănător factorului macroeconomic care a înglobat politicul și juridicul, limitându-le independența și factorul tehnologic a avansat spre ingerarea factorului cultural. Actualmente însă, este oportun de interpretat acești doi factori independent unul de altul. Elementul normativ al factorului macroeconomic presupune standardizarea și valorificarea legală a proprietății intelectuale, dar și aspecte importante ale armonizării interstatale, exemplificat prin aplicarea în Uniunea Europeană a *Regulamentului UE nr. 386 [16]*, care impune statelor membre să informeze structurile abilitate ale UE cu privire la politicile acestora privind asigurarea respectării drepturilor de proprietate intelectuală, precum și să furnizeze date statistice privind încălcarea drepturilor de proprietate intelectuală și informații privind jurisprudența [16].

Influența politică raportată la actuala industrie muzicală globală a căpătat aspect geopolitic, factorul macroeconomic fiind de facto confluența firească a trei factori externi: economic, juridic și politic. Apropierea și concreșterea acestora s-a materializat și reprezintă deja un rezultat: al implementării politicilor culturale progresiste, al globalizării și multiculturalismului, al actualizării agendei mișcării ecologiste etc. Totodată, acesta este expresia specificității transnaționale a managementului în afacerile moderne.

Factorul macroeconomic influențează negativ atât producerea și consumul muzical local, cât și producerea și consumul nemuzical local. În acest sens, exemplul României este evident: „în anul 2017, Comisia Europeană a decis împotriva României procedura de infringement, anulând norma națională și interzicând marilor comercianți și lanțuri de supermarketuri să mai achiziționeze cel puțin de 51% de producție românească autohtonă, în special: fructe, legume, miere, lactate, făinoase, ouă, carne etc. (Legea României, nr.321/2009 și nr. 150/2016) [15], punând astfel în pericol fezabilitatea, competitivitatea și durabilitatea economiei românești.

Majoritatea industriilor naționale nu posedă mecanisme interne suficiente și eficiente de protecție și promovare a produselor și serviciilor muzicale autohtone. În acest context, sunt considerate excepție țările G-20 care dețin cca 80% din comerțul mondial și 90% din PIB-ul mondial [20]. Astfel, numeroase industrii muzicale locale, devenind părți componente ale industriei muzicale globale, cedează piața internă în favoarea produselor și serviciilor muzicale de import. În acest sens s-a analizat „balanța comercială negativă a industriei muzicale din Republica Moldova” [17]. Astfel, valorificarea la radio și TV a „producției muzicale autohtone (2015-2020) a fost de cca 38%, ceea ce denotă că, cca 62% din aceste remunerațiile bănești (de autor și conexe), acumulate pe teritoriul Republicii Moldova, ar urma să fie virate altor destinatari din alte țări” [17, pp.33-40]. Acest fapt asigură persistența în industria muzicală moldovenească a unei balanțe comerciale negative. Totodată, piața muzicală a Republicii Moldova a fost cedată în consecința intrării în vigoare a noului Cod al serviciilor media audiovizuale al Republicii Moldova nr. 174/2018, deoarece, simultan au fost abrogate Deciziile Consiliului Coordonator al Audiovizualului (CA) nr.51/12.04.2007 și nr. 118/11.07.2013, care stabileau obligativitatea difuzării radio și TV a 30% de producție muzicală autohtonă” [21]. Cedarea spațiului audio-vizual s-a produs în condițiile în care dimensiunea online a industriei muzicale din Republica Moldova este totalmente nereglementată; nu există nicio companie locală care ar monetiza sau ar oferi servicii digitale în favoarea autorilor, interpreților și producătorilor locali, iar licențierea online a utilizatorilor, de către Organizațiile locale de Gestiune Colectivă, este defectuoasă. Perpetuarea unui astfel de model de industrie muzicală locală, duce inevitabil la epuizarea centrelor de creativitate muzicală.

Investigarea cvasi economică și cvasi culturală a factorilor externi demonstrează că, *digitalizarea și virtualizarea* industriei muzicale, ca și părți componente ale procesului de digitizare a economiei mondiale, reprezintă aspecte expresive importante ale tendințelor interne. Iar, *reticența culturii muzicale locale* constituie expresia potenței etnicității. Astfel, tendințele interne se interpretează în contextul atingerii obiectivului comercial al activității muzicale. În acest sens, industriei muzicale globale i se obiectează următoarele: ajungerea la cât mai mulți consumatori; epuizarea stocului și asigurarea supraprofitului; desfășurarea proceselor repede, repetat, cu amploare și în ascensiune; realizarea furnizării masive și eficiente. Prin prisma obiectivului comercial, tendința de digitalizare a producerii a favorizat virtualizarea consumului, ambele aspecte fiind elemente remarcabile ale industriei muzicale pentru perioada post pandemică (2022). Aceste tendințe ale dezvoltării industriei muzicale globale continuă, îndeosebi prin intermediul tehnologiei performante și, sunt omniprezente, pervazive și suspecte. În industria muzicală virtualizarea depășește limita mediatizării și promovării acceptabile, transformându-se în propagare intenționată.

În sens culturologic, dinamica sporită a industriei muzicale globale, inclusiv aspectul fulminant *de virus* nu ține de esența mesajului muzical, de componenta valorică a produselor

și serviciilor sau de axiologia proceselor, ci este consecința explorării progresiste a spațiului digital, actualmente reglementat insuficient. Distribuirea digitală fulminantă reprezintă un fenomen produs în circumstanțe de interferență mediatică digitală sporită a lanțurilor social media. În rezultatul virusării spațiului de distribuție crește cererea, care la rândul său provoacă micșorarea duratei de luare a deciziei. Acest procedeu marketologic „grăbește transformarea consumatorului țintă în consumator final” [19, pp. 21-29]. Tendințele interne noi ale industriei muzicale globale, de rând cu reformatarea unor subcomponente structurale, se amplifică în dependență de relaționarea sa cu instituțiile și organizațiile sociale, economice, politice și culturale asociate industriei muzicale. Deși aceste entități nu sunt considerate parte a structurii interne, acestea constituie la rândul lor un alt factor de influență externă.

5. Concluzii

Cercetările efectuate în domeniul industriei muzicale au permis formularea următoarelor concluzii:

1. Analizând literatura de specialitate, s-a constatat existența diverselor abordări privind dezvoltarea industriei muzicale. Fiecare abordare caracterizează industria muzicală dintr-un anumit aspect. Astfel, deducem că, actualul spațiu geografic, transcontinental și transnațional, în care funcționează structura extinsă a industriei muzicale globale, este unul de natură civilizațională. Paradigmă civilizațională evidențiază la modul concret elementele și caracterul dilemei noastre: *emoțiile, instituțiile și tehnologiile*.

2. Dificultatea cercetării dilemei industriei muzicale globale este elucidată în cadrul a patru tipuri ale corelației între industria muzicală locală și industria muzicală globală, care sunt stabilite și le dezvoltă țările sub influența culturalizării și tehnologizării.

3. Totalitatea provocărilor acostate din afara structurii industriei muzicale generează tendințe interne noi în dezvoltarea industriei muzicale locale, caracterizându-se prin trei factori externi: cultural, tehnologic și macroeconomic. Astfel, factorii externi constituie expresia, iar tendințele interne reprezintă reflecția acestei expresii.

4. Expresia influenței factorilor externi se reflectă prin evidente tendințe interne ale industriei muzicale, precum: digitalizarea, virtualizarea, epuizarea centrelor de creativitate muzicală și reticența culturii muzicale autohtone în raport cu industria muzicală globalizată.

5. La baza dezvoltării industriei muzicale globale stă asocierea și combinarea factorilor cu tendințele, care dezvoltă relații specifice - *de dilemă* și, necesită cercetare suplimentară. Totodată, dimensiunea transcontinentală și transnațională a industriei muzicale poartă caracter civilizațional, astfel încât dilema dezvoltării industriei muzicale, în condițiile anului 2022 și în perioada imediat următoare, constă în identificarea unei noi direcții de dezvoltare sau perpetuarea precedentei.

Conflicte de Interes. Autorul nu declară niciun conflict de interese.

Referințe

1. Badicu, I. Reticența culturii muzicale autohtone în circumstanțele industriei muzicale globalizate. În: „Тенденції та перспективи розвитку науки і освіти в умовах глобалізації”, Матеріали Міжнародної науково-практичної інтернет-конференції. Україна, Переяслав, Вип. 81. 29 квітня 2022 року; 72-75 с. Disponibil online la: <https://d6scj24zvfbbo.cloudfront.net/12ac69b5c0bec343f11779551473023e/200000458-35e8f35e91/%2081-9.pdf?ph=0a30397da1>
2. IPFI – representing recording industry worldwide. Disponibil online la: <https://www.ifpi.org/ifpi-issues-annual-global-music-report-2021/> (accesat la 12.05.2022).

3. Kanellopoulou, E. Competition Policy and the Music Industries. A Business Model Perspective; Publisher: London, Routledge, 2021; 200 p. <https://doi.org/10.4324/9780429281419>
4. Galuszka, P. Eastern European Music Industries and Policies after the Fall of Communism: From State Control to Free Market; Publisher: Poland, Taylor and Francis, 2021; 213 p.
5. Fukuyama, F. Sfârșitul lumii și ultimul om. Editura: București, Paideia, 1994; 351 p.
6. Fukuyama, F. Încredere: Virtuțile sociale și crearea prosperității; Editura: Prahova, Antet Press, 2009; 194 p.
7. Huntington, S. Ciocnirea civilizațiilor și refacerea ordinii mondiale; Editura: București, Litera, 2012; 670 p.
8. Efremov, A. Bor'ba za istoriju. Konceptija Danilevskogo v ocenke sovremennikov; Izdatel'stva: Moskva, Pashkov Dom, 2006; 168 c. (In Russian).
9. Wilson, E. Originile creativității umane; Editura: București, Humanitas, 2019; 196 p.
10. Evola, I. Tradiția hermetică: Simbolurile ei, doctrina și „Arta Regală”; Editura: București, Humanitas, 1999; 284 p.
11. Guenon, R. Criza lumii moderne; Editura: București, Herald, 2022; 192 p.
12. Dașevschi, V. Improvizatia de jazz. Scurtă trecere în revistă a ghidurilor teoretico-metodologice de bază. În *Studiul artelor și culturologie: istorie, teorie, practică*, Ed. Notograf Prim, Chișinău, 2017, 2 (32), pp. 244-248.
13. Toynbee, A. Studiu asupra istoriei, sinteza volumelor I-VI, de Somervell. Ed. Humanitas, București, 1997, 761.
14. Toynbee, A. Studiu asupra istoriei, sinteza volumelor VII-X, de Somervell. Ed. Humanitas, București, 1997, 542 p.
15. Forbes, Romania. Comisia europeană a declanșat o procedură de infringement împotriva României și Ungariei pentru legislația din comerțul cu alimente din supermarketuri. Disponibil online la: <https://www.forbes.ro/comisia-europeana-declansat-o-procedura-de-infringement-impotriva-romaniei-si-unagarie-pentru-legislatia-din-comertul-cu-alimente-supermarketuri-77243> (accesat la 03.07.2022).
16. Regulamentul (UE) nr. 386/2012 al Parlamentului European și al Consiliului din 19 aprilie 2012 privind atribuirea către Oficiul pentru Armonizare în cadrul Pieței Interne (Mărci, desene și modele industriale) a unor sarcini legate de asigurarea respectării drepturilor de proprietate intelectuală, inclusiv reunirea reprezentanților sectorului public și privat în cadrul Observatorului European al Încălcărilor Drepturilor de Proprietate Intelectuală. Disponibil online la: <https://eur-lex.europa.eu/legal-content/ro/TXT/?uri=CELEX:32012R0386> (accesat la 22.06.2022).
17. Badicu, I. 51% de muzică autohtonă: imperativ cultural și normă juridică pentru dezvoltarea industriei muzicale din Republica Moldova. *Intellectus* 2022, 1, pp. 33-40. DOI: <https://doi.org/10.56329/1810-7087.22.1.03>.
18. Badicu, I. Transformarea activității muzicale în industrie: rolul cultural și miza economică a invențiilor. *Intellectus* 2021, 1-2, pp. 57-60.
19. Badicu, I. The Influence of the Digital Economy Development on the Global Music Industry. *European Journal of Accounting, Finance & Business* 2022, 10 (1), pp. 21-29. DOI: 10.4316/EJAFB.2022.1013.
20. World Economic Forum, The Future of Jobs Report 2020. Published: 20 October 2020. Disponibil online la: <https://www.weforum.org/reports/the-future-of-jobs-report-2020/> (accesat la 21.05.2022).
21. Badicu, I. Dimensiunea autohtonă a proprietății intelectuale: aspecte ale industriei muzicale. În: *Simpozionul științifico-practic „Lecturi AGEPI”*. Chișinău, 19 aprilie 2022. Disponibil online la: <https://www.youtube.com/watch?v=TwmbmjHJmm8>.

Citation: Badicu I. The dilemma of music industry development: external factors and internal trends. *Journal of Social Sciences* 2022, 5 (3), pp. 155-167. [https://doi.org/10.52326/jss.utm.2022.5\(3\).12](https://doi.org/10.52326/jss.utm.2022.5(3).12).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).13](https://doi.org/10.52326/jss.utm.2022.5(3).13)
UDC 391.004.67



DIGITAL REVITALIZATION OF POPULAR PORT PRODUCTS

Svetlana Cangas*, ORCID: 0000-0001-8495-583X,
Elena Florea-Burduja, ORCID: 0000-0001-8318-1756

Technical University of Moldova, 168 Stefan cel Mare Blvd, Chisinau, 2004, Republic of Moldova

*Corresponding author: Svetlana Cangas, svetlana.cangas@dttp.utm.md

Received: 07. 22. 2022

Accepted: 08. 26. 2022

Abstract. Restoring and revitalizing popular port products is a long-term process. The time workmanship for making a shirt by an experienced craftswoman lasts about from six to nine months. Various studies of the folk costume often require the restoration of the product. The need for restoration is imposed by: the analysis and study of the cooperation of embroidery elements with the form of product offered by shirts of different types; analysis and adaptation of the shape of the shirt to the conformation of the wearer; analysis of the form and assembly methods offered by the cut schemes; restoration of cut landmarks and schemes with immediate simulation on the mannequin of museum products (Republic of Moldova); analysis and adaptation of these products to carrier conformation parameters; identification of conformation parameters, etc. The advanced level of contemporary digital technologies allows us in reduced time to simulate the product form without waste accumulations and the destruction of raw material resources. In this work will be presented the results offered by the digital simulation of the products of folk costumes, vestiges of the cultural heritage from the Museum of History and Ethnography, Hancesti city. You also have the connection possibilities of digital technologies and technologies used in the manufacture of popular port products.

Keywords: *CLO 3d, decorative elements, embroidery elements, tailoring.*

Rezumat. Restabilirea și revitalizarea produselor de port popular este un proces de lungă durată. Manopera de timp pentru confecționarea unei cămăși de către o meșterită experimentată este în mediu de șase-noua luni. Diverse studii ale portului popular impun frecvent restabilirea produsului. Necesitatea restabilirii este impusa de: analiza și studiul conlucrării elementelor de broderie cu forma de produs oferită de cămășile de diferite tipuri; analiza și adaptarea formei cămășii către conformația purtătorului; analiza formei și metodelor de asamblare oferite de schemele de croială; restabilirea reperelor și schemelor de croiala cu simularea imediată pe manechin a produselor de muzeu (R. Moldova); analiza și adaptarea acestor produse către parametrii de conformație a purtătorului; identificarea parametrilor de conformație, etc. Nivelul avansat al tehnologiilor digitale contemporane ne permit în timp redus să simulăm forma de produs fără acumulări de deșeuri și distrugerea resurselor de materie primă. În aceasta lucrare se vor prezenta rezultate oferite de simularea

digitală a produselor de port popular, vestigii ale patrimoniului cultural din Muzeul de Istorie și Etnografie, or. Hâncești și posibilitățile de conexiune ale tehnologiilor digitale și tehnologiilor utilizate la confecționarea produselor de port popular.

Cuvinte cheie: *CLO 3d, elemente de broderie, elemente decorative, croiala.*

1. Introducere

Costumul popular este unul din produsele care a acumulat și a cultivat de milenii tradițiile culturale ale unui anumit popor [1, 2]. Odată cu industrializarea și confecționarea produselor de îmbrăcăminte de orice destinație în tiraj considerabil costumul portului popular a rămas să se identifice în calitate de obiect unicat care înscrie în sine legendele, doinele și tradițiile poporului.

Până la sf. sec. al XVII-lea costumul orășenesc și costumul purtătorului de la sat nu se deosebeau ca aspect exterior și componente, practic cu nimic, decât prin materialele utilizate din care se confecționau [3, 4]. La populația înstărită orășenească îmbrăcămintea se confecționa din materiale de import și cei de la sat, cu statut financiar modest purtau costumul confecționat în condiții de casa, din materiale cum ar fi: inul, cânepă, bumbac, lână sau totul ce putea fi cultivat în zona ogorului sătesc și prelucrat de sine stătător, cu forțele proprii [5]. Populația sătească a rămas să fie pătura conservatoare în care forma vestimentară și tradițiile culturale sunt cele mai longevive. Și astăzi în epoca globalizării deja, costumul popular conservându-se rămâne să fie acea verigă, care menține identitatea unei etnii punând în valoare rădăcinile culturale.

Studiile realizate în domeniul etnografiei sunt actuale prin redescoperirea tehnologiilor de confecționare [6, 7], de prelucrare a materiei prime, elaborarea a noi modele estetice de îmbrăcăminte oferite de aspectul exterior al produsului de port popular, care astăzi în urma abordării produsului sustenabil sunt foarte utile. Sustenabilitatea, este o tendință actuală a activităților de producere, tendință de utilizare a materiei prime cu minimizarea deșeurilor și de cercetare a oportunităților de abordare a industriei verzi. Activitățile de producere încă se caracterizează prin acumulări de deșeuri și suprasaturarea pieței cu produse. Utilizarea și dezvoltarea resurselor naturale fără a conduce la epuizarea acestora, fără a distruge mediul înconjurător este o tendință care tot mai mult se infiltrează în viața cotidiană.

Industria confecțiilor se caracterizează printr-un ritm accelerat de modificare ale preferințelor estetice ale consumatorului. Caracteristica de longevitate a produsului de port popular remarcată prin: croiala abordată, decorul de broderie, compoziția ornamentală, simbolul semnelor cusute, atitudinea simbolică față de tipul de produs ar putea contribui către modificarea duratei de viață a produselor de îmbrăcăminte, încălțăminte și reținerea concurențială a acestora pe piață la un preț adecvat, respectiv și reducerea deșeurilor.

Tehnologiile digitale astăzi ne oferă posibilități de revitalizare și simulare a produsului de îmbrăcăminte fără a produce deșeuri caracteristice domeniului confecției. De aceea problemele cheie cum ar fi: analiza și studiul conlucrării elementelor de broderie cu forma de produs oferită de cămășile de diferite tipuri; analiza și adaptarea reperelor cămășii și altor produse de port popular din schemele de croire oferite de studiile în etnografie către conformația purtătorului; analiza formei și metodelor de asamblare oferite de schemele de croială; restabilirea reperelor și schemelor de croiala din produsul gata- mostra de muzeu (R. Moldova), cu simularea imediată pe manechin; analiza și adaptarea produselor de port

popular- mostra de muzeu, către parametrii de conformație a purtătorului cu identificarea acestor parametri de conformație se pot realiza utilizând softuri contemporane 3d.

2. Materiale și Metode

Pentru studierea problemei au fost analizate mostrele patrimoniului Muzeelor de Istorie și Etnografie din or. Hâncești, or. Nisporeni, or. Leova și constatările studiilor etnografice ale formei, croielii, decorului și simbolului, metodelor de asamblare ale pieselor costumului portului popular al R. Moldova, România. Studiul a presupus simularea digitală utilizând aplicații ale tehnologiilor informaționale precum și sinteza, și analiza logică, comparativă și sistemică a modelelor de structură compozițională a elementelor costumului popular, a proporțiilor și modului de stratificare a pieselor vestimentare. Prin identificarea grafică comparativă a broderiilor și elementelor de decor în costum sau identificat simbolul și legenda ornamentului și decorului utilizat.

3. Rezultate

3.1. Restabilirea digitală a portului popular pentru femei și bărbați din zona de centru a R. Moldova, or. Hâncești

Pentru vizualizarea aspectului estetic în scop de analiză a volumului formei oferită de croiala de produs, proporții influențate de corelația zonelor ornamentate ale produsului cât și influența simbolică a poziției elementelor de broderie, etc. s-a considerat necesară realizarea prototipurilor produselor de port popular utilizând aplicațiile digitale contemporane cum ar fi CLO 3d [8]. CLO 3d prezintă o aplicație care oferă posibilitatea de redactare a produsului vestimentar în format digital direct pe manechin. Este un program care concomitent cu redactarea în 3d a formei de produs și simularea acesteia în defileu, permite și editarea 2d a reperelor produsului fapt care lărgeste considerabil posibilitățile de aplicare în diverse domenii precum și cel al studiului formei produsului de port popular prin restabilirea și revitalizarea digitală a acestuia (Figura 1-3).



Figura 1. Cămașa pentru mame care alăptează, produs din portul popular, or. Hâncești, zona de centru R. Moldova, mărimea: 164-88-96.

Sursa: simulare CLO 3d-elaborat de autori.

Pentru studiul de față în calitate de mostra a servit costumul pentru femei pentru fiecare zi și costumul pentru bărbați de aceeași destinație din Muzeul de Istorie și Etnografie din or. Hâncești care beneficiază de o expoziție a costumului popular, femei și bărbați, purtat

în această regiune. Cu ajutorul redactorului 3d s-a obținut vizualizarea în detaliu atât în statica cât și în dinamica a costumului de port popular și a pieselor componente (Figura 1-3).

Restabilirea digitală a fost posibilă având ca bază dimensiunile preluate de pe mostrele de muzeu și identificarea formei reperelor în baza studiilor și analizei croielii produselor de port popular. Formatul digital al produsului de port popular a permis adaptarea și stabilirea tipului de purtător de anumiți parametri de conformație fapt care facilitează analiza proporțiilor formei de produs, dar și analiza aspectelor de confort.



Figura 2. Portul popular pentru femei, or. Hâncești, zona de centru al R. Moldova. Caracteristici de mărime ale purtătoarei 164-88-96.

Sursa: simulare CLO 3d-elaborat de autori.

În figura 1 este prezentată remodelarea digitală a cămășii pentru mame care alăptează copii. Aranjarea pe corpul manechinului digital feminin de mărimea 164-88-96 ne permite să identificăm că lungimea produsului mostră este până la genunchi. Lungimea mânecii tradițional se purta de $\frac{3}{4}$ pentru a nu încurca lucrărilor și muncilor casnice sau câmp păstrând în așa mod terminația destul de largă a mânecii și în același timp lăsând încheietura mâinii liberă.



Figura 3. Cămașă dreaptă de croială de tip tunică universală și izmene. Caracteristici de mărime ale purtătorului 164-92-92.

Sursa: simulare CLO 3d-elaborat de autori.

Răscroiala gâtului la analiza vizuală în cămașa portului popular, frecvent întâlnită în mostrele de muzeu și aparent destul de mică, în cazul modelării digitale pe manechinul selectat s-a aranjat corect, păstrând echilibrul, forma plătcii și a răscroielii gâtului pătrată.

universal pentru cămășile care prezintă caractere specifice acceptat de toată literatura de specialitate [9, 10].

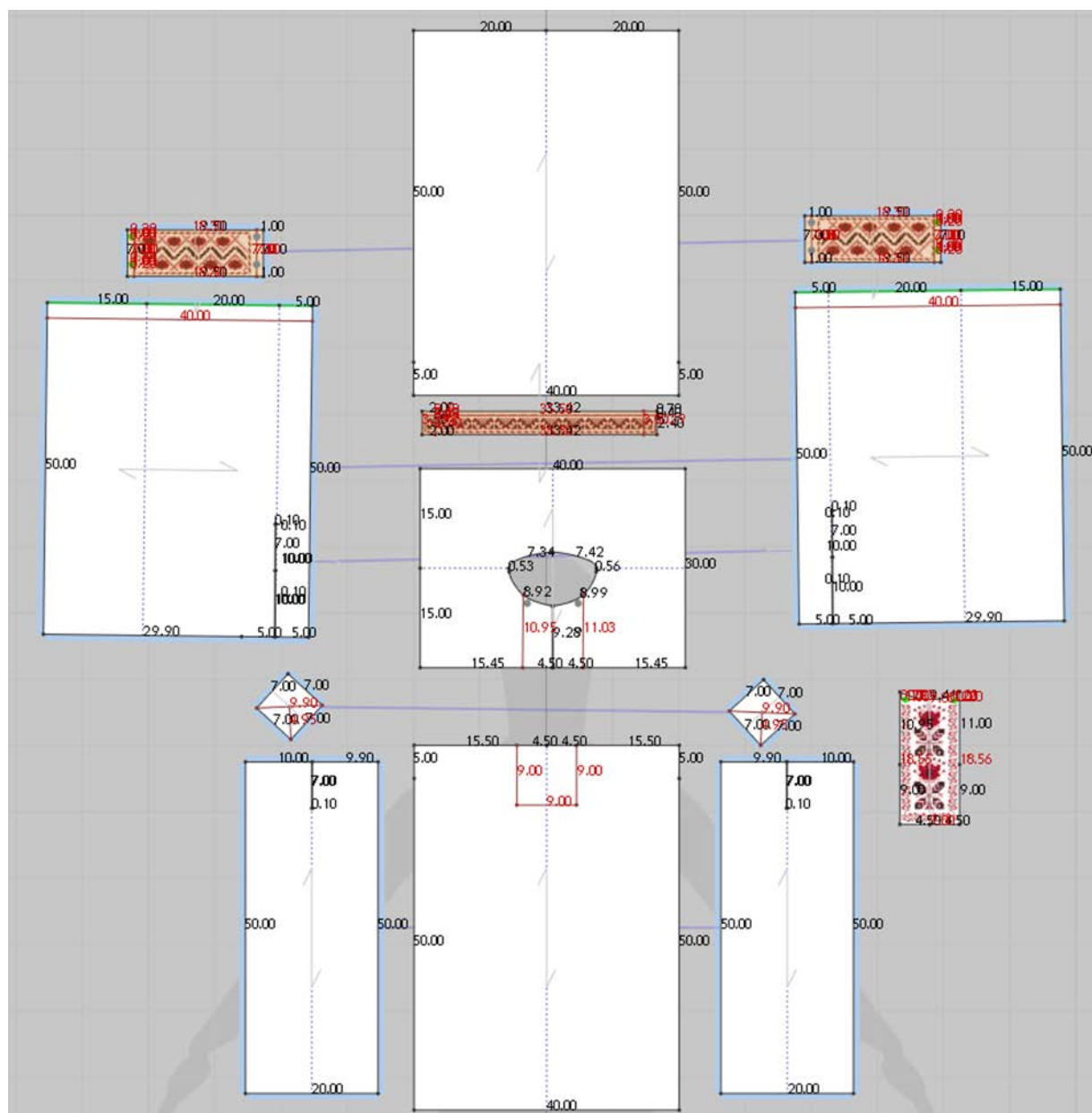


Figura 5. Repere ale produsului cămașa pentru bărbați, R. Moldova, or. Hâncești.

Sursa: simulare CLO 3d-elaborat de autori.

Cămașa pentru femei din figura 1, 2, 4 este de destinație specială având intrare către zona de bust a femeii cu scop de alăptare a copilului rezolvată prin divizarea suplimentară a reperului de platcă pe linie orizontală pe fața produsului și formarea unui sistem de închidere suplimentar pe această linie de divizare orizontală în afară de cel tradițional în linia verticală a fentei de produs.

Costumul pentru femei, dar și bărbați este unul stratificat sau piesele vestimentare se îmbrăcau una peste cealaltă completând succesiv aspectul exterior al purtătorului (Figura 2, 3). „Femeia după somn, dimineța, pentru a se îngriji de treburile casnice, pe timp de vară, îmbrăca peste cămașa lungă fusta și era pregătită pentru a ieși în curte și în afara ei”, relatează doamna ghid din Muzeul de Istorie și Etnografie din or. Hâncești. Cămașa lungă și fusta prezentau prin sine costumul de vară cu destinația de fiecare zi. Fusta sau „poalele” erau de

culori închise - gri sau maroniu foarte apropiat de negru (Figura 2, 6). Fustele sau „poalele” nu se brodau, de aceea, de obicei se confecționau din textile de legătura satin care conferea netezime și un ușor luciu. La terminația „poalelor” pe față produsului se aplicau feșii de atlas și se coseau câteva rânduri orizontale de fronseuri pliate de lățimea 0,6-0,7 cm. Respectând tradiția portului orășenesc, terminația fustei pe dos se prelucra suplimentar cu o fâșie de material în carouri de lățimea 15-17 cm, fapt care permitea să sporească sau să întărească rezistența produsului la terminație, dar prezenta și rol subtil decorativ.

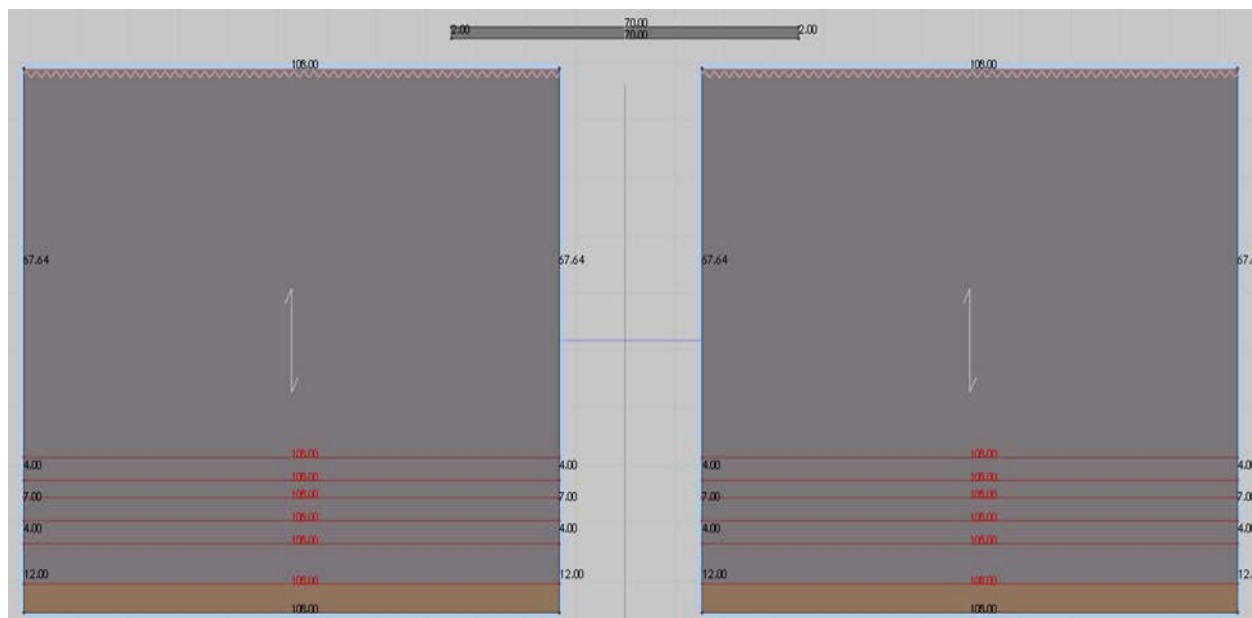


Figura 6. Repere ale produsului fusta, îmbrăcăminte pentru femei, or. Hâncești.

Sursa: simulare CLO 3d-elaborat de autori.

Răscroiala gâtului la cămașa costumului pentru femei este pătrată, practic respectând conturul liniei de baza a gâtului și garnisită cu dantelă realizată cu acul (Figura 2). La cămașa pentru bărbați răscroiala gâtului este prelucrată cu guler stei de formă dreaptă ce cuprinde strâns cilindrul gâtului și este frumos decorat cu broderie (Figura 3).

Îmbrăcămintea de fiecare zi pentru bărbați se formează din cămașă de lungimea ce depășește foarte puțin linia soldurilor și izmene. Cămașa pentru bărbați în portul popular pe teritoriul R. Moldova și nemijlocit zona Hâncești se confecționa din materiale naturale înălbite la soare și garnisite cu elemente de broderie. Silueta formei cămășii tradiționale era dreaptă. Analiza morfologică a cămășii portului popular pentru bărbați ne permite să o atribuim către cămașa tip tunică, mocănească, pe creț cu platcă [1, 9].

Terminația mânecii la cămașa pentru bărbați se putea lăsa largă în special pentru cămășile de ocazie sau se închidea printr-o manșetă - numită și brățară, de lățimea 7 cm, întâlnită frecvent pentru produsele de fiecare zi pentru a permite mișcări în lucru, dar prelucrarea terminației mânecii cu manșetă nu era un indiciu definitoriu de destinație al produsului. Izmenele de fiecare zi se purtau largi pentru a nu stingheri mișcările. Forma izmenelor se obținea din reperele de croială obișnuită pentru produsele de port popular de acest tip întâlnite în sudul și centrul zonelor etnografice a R. Moldova (Figura 3, 7).

Restabilirea formei produselor și adaptarea acestora către manechinul digital utilizând CLO 3d a permis identificarea caracteristicilor de conformații și a mărimii produselor de port popular care pentru costumele feminine sunt de 164-88-96 și pentru costumele bărbătești sunt de 164-92-92. Constatări realizate în urma poziționării reușite a cămășii, fustei pentru femei

și cămășii și pantalonilor pentru bărbați pe linia umărului, răscroiala gâtului și lungimea mânecilor și a produsului.

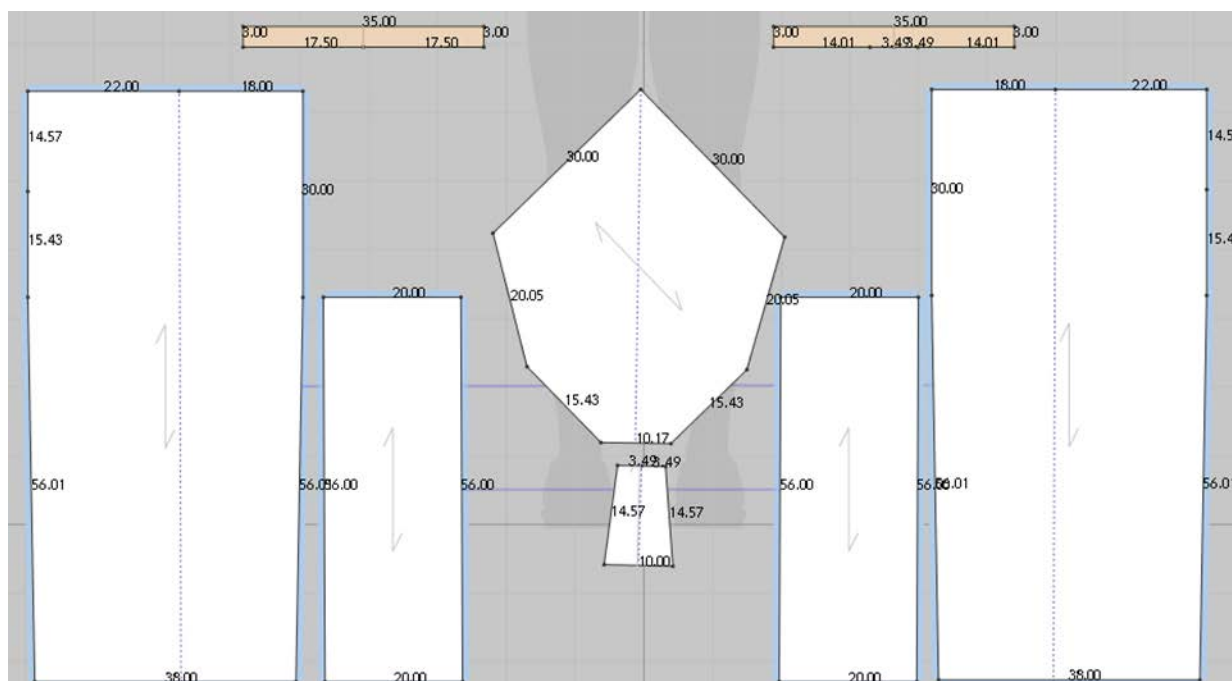


Figura 7. Repere ale produsului izmene pentru bărbați, R. Moldova, or. Hâncești.

Sursa: simulare CLO 3d-elaborat de autori.

Adaptarea lungimii mânecilor, lungimii produselor și zonei de sprijin a umărului către manechinul digital femeii și bărbați ne permite să argumentăm că purtătorul și purtătoarea se caracterizează prin înălțime medie, dezvoltare destul de zveltă fără proeminență caracteristică a abdomenului și umerii de lățime moderată (Figura 1- 3).

3.2. Analiza particularităților de croire și asamblare a produselor de port popular

Produsele de port popular se confecționau din repere patrulatere de dimensiunile părților corpului care le acopereau și dimensiunea bucății de material țesute în condiții casnice sau în perioada interbelică material preponderent de tip pânză țesut industrial (Figura 4-7). Reperul de mânecă în cămașa populară la fel este un patrulater. Pentru lejeritate în mișcare în zona subrațului către mânecă și corpul de produs se assemblează pava, element nelipsit în construcția oricărei cămăși [9, 10]. Pava se putea realiza dintr-un alt material și putea fi cu ușurință schimbată în cazul uzării, astfel prelungindu-se durata de viață a produsului cămașă. La fel pava se putea croi integral cu clinul lateral al cămășii sau integral cu clinul reperului mânecă. În produsele de port popular restabilite, pava cămășii pentru femei formează un pătrat de dimensiunea 10×10 cm și pava cămășii pentru bărbați este de 7×7 cm (Figura 4, 5).

Nu în toate produsele din patrimoniul Muzeului de Istorie și Etnografie al or. Hâncești pava în cămașă formează un pătrat regulat, fapt care menționează că erau folosite absolut toate bucățile minimizând în așa fel deșeurile, ori acestea la croirea produselor de port popular practic nu sunt. Cămașa și pantalonii pentru bărbați sau confecționat din material de lățimea de 40 cm. Cămașa pentru femei s-a confecționat din material de lățimea de 110 cm. Stanul cămășii pentru femei este croit din întreaga lățime a materialului oferind o singură cusătura de asamblare la linia spatelui (Figura 4). Asamblarea reperelor cămășilor și a altor produse a costumului popular este destul de complexă și se ghidează în permanentă prin

aranjarea alăturată a reperelor în schemele de croire ale reperelor (Figura 4-7) și prezentarea liniilor de coasere în forma produsului asamblat (Figura 8).



Figura 8. Linii de asamblare și cute ale pliurilor în față, în cămașa pentru femei și îmbrăcămintea pentru bărbați.

Sursa: simulare CLO 3d-elaborat de autori.

Cămășile portului popular de sărbătoare, de ocazii speciale, sunt asamblate cu tighele realizate manual numite „cheițe” care prin aspectul său diversificau esteticul produsului. Cămășile luate în studiu sunt asamblate la mașina de cusut prin cusături de asamblare și cusături de aplicare dublate pentru a spori rezistența, dar și a obține o cusătură care-și păstrează netezimea la spălări repetate și nu în ultim rând întonând tehnologiei de asamblare prin cheițe unde rezervele de coasere pe dosul produsului se prindeau cu punct ascuns. Cămășile sunt garnisite cu elemente de broderie realizate manual motiv pentru care încercăm să plasăm aceste cămăși cu destinația de fiecare zi sau pentru a merge la târguri, șezători, etc. mai puțin pentru a merge la munci grele în ogor etc.

Analiza schemelor de croire a cămășilor de port popular preluate din diverse surse bibliografice cu simularea ulterioară digitală în 3d, utilizând dimensiunile reperelor propuse, a permis să observăm că deseori forma obținută este mult prea mare și necesită un manechin de dimensiuni considerabile [10]. Deși produsul de port popular este un produs practic adimensional datorită sistemului modular de obținere a formei produsului prin reperele patrulatere din care se confecționează, forma cămășii asamblate este necesar frecvent să fie corelată în cazul manechinilor de mărimi tradiționale medii, prin eliminarea de clini laterali ai stanului, propuși în fâșia reperelor necesar de croit și asamblat. Și de fapt într-o gospodărie țărănească atunci când se croia un produs de îmbrăcăminte cu lățimea reperelor dictată de lățimea materialului țesut, acesta se adapta către tipurile de conformație ale familiei, ori se lucra cu adăugire sau eliminare de clini în forma finală influențată de tipul de cămașă purtat în zona etnică (menționat și de meșteritele care lucrează la costumul popular și de custodiile muzeelor vizitate).

3.3. Analiza raporturilor estetice, simbolice și funcționale ale elementelor de broderie în costumul portului popular din or. Hâncești

Multiplele domenii în care se manifestă arta populară, sunt dovezi de afirmare a înaltelor posibilități creatoare, a talentului și îndemnării pe care artistul popular a știut să le îmbine în mod armonios, reușind să creeze obiecte de o înaltă valoare artistică, care să-l întovărășească de-a lungul anilor atât în munca depusă zi de zi cât și în clipele de răgaz [11].

Aspectul estetic în costumele populare este format de rândurile de broderie cu mesaje simbolice aparte, amplasate diferit cu respectarea tradițiilor subzonei culturale. În zona Hâncești elementele de broderie în cămașa de tip tunică sunt prezente pe manșetă și fenta din față. Fenta păstrează în cămașa pentru bărbați de tip tunică lungimea de până la linia bustului. În cămașa pentru femei lungimea fentei putea varia fiind până la linia bustului sau depășind-o, în unele cazuri putea fi și ceva mai sus de linia taliei. Modelele de cămăși pentru femei cu terminația liberă a mânecii sunt preponderent garnisite printr-un rând îngust de broderie cu elemente florale sau geometrice. În cămașa din studiul prezentat terminația mânecii precum și fenta sunt garnisite prin ornamentul rombului puternic stilizat care simbolizează semnul pământului însămânțat (sarcinii). În cămașa pentru bărbați (Figura 9) broderia fentei se formează din chenar și mesajul ornamentului central, la prima vedere, rezolvat prin conturul dominant al imaginii stilizate a florii de trandafir încadrând în sine o siluetă antropomorfă feminină. Chenarul fentei reprezentând un fir ondulat de formă dezvoltată a frunzelor și florilor ce se succed, cât și ornamentul de pe manșetă sub forma de zigzaguri, fac să se întâlnească două interpretări ale aceluiași motiv de „șuvoi”, „șirlău”, „șenătău” folosită în compozițiile ornamentale legate de ideea fertilității și a vitalității. Motivul „șuvoaielor” care își are originea în una din străvechile variante ale „Apelor fecundative cerești” este considerat drept stimulatorul ideii râvnite dintotdeauna a omenirii - cea a reproducerii clanului familial și a belșugului [1, 12].



Figura 9. Amplasarea și grafica broderiei în cămașa pentru bărbați.

Sursa: simulare CLO 3d-elaborat de autori.

Imaginea figurii feminine în ornamentul portului popular se întâlnește cu mâinile pe șolduri simbolizând femeia autoritară, cu mâinile la piept sau palmele aduse sub bărbie în ipostaza de gânditoare și cu mâinile în sus - după unele surse este simbolul de venire al primăverii sau rugăciune de ploaie, sau femeia zeiță [13, 14]. Figura feminină în aceeași interpretare grafică este întâlnită și în picturile de pe vasele cucutene. Din imaginea broderiei în care silueta feminină are lungimea poalelor „clopotate” de până la genunchi [12, 15], se poate afirma că se vorbește despre femeia tânără - zeiță bărbatului aducătoare de belșug și ocrotitoare a casei. Imaginea rombului încadrat în vârful florii de trandafir sau semi rombului de pe broderia gulerului ne consemnează despre ogorul însămânțat - un semn vechi al broderiei autohtone interpretat în diferite moduri [15, 16].

Segmentele în ornamentul popular întotdeauna au avut rolul de protecție, în interpretarea broderiei gulerului (Figura 9) se pot revoca ca simbol al coarnelor berbecului care semnalizează virilitatea bărbătească [17, 18]. La analiza generalizată a broderiei centrale de pe fenta cămășii bărbățești care se reprezintă printr-un simbol al morii și pomul cosmic de tip brăduț ce finalizează prin silueta masivă de trandafir care se poate etala cu siluetă

feminină, deja matură, se poate identifica mesajul protector și de continuitate al ritmului ciclic al generațiilor prezente și viitoare.

4. Concluzii

Utilizarea materialelor de origine naturală realizate în condiții casnice pentru confecționarea îmbrăcăminte a contribuit la formarea unui sistem econom de croire și identifică în costumul popular grafica stilizată a ornamentului frecvent subordonată legăturii de țesere a firelor materialului. Pentru identificarea și argumentarea simbolului broderiei îmbrăcăminte pentru femei și bărbați din această lucrare au fost utilizate surse care datează cu anul 1912, 1959, 2020, 2021 prezentate de cercetătorii Erich Kolbenheyer, Paul Petrescu, Anna Zaitseva, Varvara Buzilă, etc. Diversitatea surselor permite să conchidem că argumentul legendei ornamentului este unul corect și se bazează pe problema fertilității, „guvernării” în timp, abundenței și transmiterii cunoștințelor și tezaurului popular.

Revitalizarea digitală în format 3d a produselor de port popular ne-a permis să identificăm mărimea purtătorului să vizualizăm produsul îmbrăcat cu aprecierea corectă a esteticului, proporțiilor formei, dar și al poziționării construcției reperelor acestuia. Reperele obținute sunt exacte și corespund modelului din formatul digital 3d cu simularea caracteristicilor de material și elementelor de broderie și dantelă. Rezultatele obținute sunt rapide și suficient de exacte excluzând din procesul de confecționare o serie de probe și machete pe manechin.

Mulțumiri: Studiul se bazează pe materialele și mostrele furnizate de Muzeul de Istorie și Etnografie din orașul Hâncești. Studiul prezintă rezultatele proiectului 20.8009.0807.17. Educație pentru revitalizarea patrimoniului cultural național prin tehnologiile tradiționale de prelucrare utilizate în Republica Moldova, în contextul multiculturalismului, diversității și integrării europene.”

Conflicte de Interes. Autorii nu declară niciun conflict de interese.

Referințe

1. Apostol-Macovei, T. Simbolismul cromatic în cultura românească tradițională. Ch, Î.E.P. Știința, 2019, 208 p, ISBN 978-9975-85-158-9.
2. Cangaș, S; Florea-Burduja, E. Clothing product of the folk costume with a utility and symbol-apron role, Collection of materials of the IV International scientific and practical conference "Actual problems of modern design", Kyiv: KNUTD, 2022. Vol. 1. 303 c., ISBN 978-617-7506-98-9, pp. 130-133.
3. Zelenchuk, V.S. Moldavian national costume. Kishinev, «Timpul», 1983. [in Russian]
4. Kangash, S.; Florea, Ye Vosstanovleniye identichnosti i simvoliki elementov vyshivki i kruzheva, Proceedings of the 3rd International Scientific and Practical Conference "Actual Problems of Modern Design", Kyiv: KHYTD, 2021. Vol.1. 321 c, ISBN 978-617-7506-78-1, pp. 35-39. [in Russian]
5. Buzilă, V. Retorica vestimentară: cămașa cu altiță; Ministerul Culturii al Republicii Moldova, muzeul Național de Etnografie și Istorie Naturală-Chișinău: S. N., 2022 (lexon-Prim), 311 p. ISBN 978-9975-163-16-3.
6. Buzilă, V. Costumul popular din Republica Moldova, Ghid practic, Chișinău-2011, 170 p.
7. Bâtcă, M. Costumul popular românesc, Colecția, „Album de artă populară”, editat-Centrul Național pentru Conservarea și Promovarea Culturii Tradiționale, București-2006, 242 p, ISBN-13 978-973-0-04723-3.
8. Software CLO 3D. Available online: <https://www.clo3d.com/en/> (15.06.2022).
9. Formagiu, H-M. Portul popular din România, The Folk Costume in Romania, Alcor edimpex, București, 2021, 251 p, ISBN 978-606-8718-21-7.
10. Petrescu, P. Costumul popular românesc din Transilvania și Banat, Editura de stat didactică și pedagogică 1959, 144 p.
11. Pintilescu, A. Modele de cusături românești, Editura Tehnică, București- 1977.
12. Mardare, Gh. Arta covoarelor vechi românești basarabene, Chișinău: Cartier, 2016, 336 p, ISBN 978-9975-86-95-6.

12. Zaitseva, A. Russkaya vyshivka: Bol'shaya prakticheskaya entsiklopediya Moskva Eksmo, 2020, 272p., ISBN 978-5-04-102173-3. [in Russian]
13. Brătianu, E. I. Cusături românești, Ediție a Consiliului superior al Industriei Casnice, Mărvan-București, 1943, 185 p.
14. Miller-Vergy, M. Izvoade strămoșești, București, Editura librăriei SOCEC, & Co., Soc. Anon., 1927, 101p.
15. Dunăre, N. Broderia populară românească. Meridiane, Sibiu, 1985, 213 p.
16. Postolache, E. Casa mare-funcții și decor, Buletinul Științific al Muzeului Național de Etnografie și Istorie Naturală a Moldovei, Chișinău 2007, 7 (20), pp. 34-44.
17. Kolbenheyer, E. Designs of the home-industry embroideries in Bukovina, collected, published by the imperial ministry for public works and the Bucovina Diet, 1912, 200 p.

Citation: Cangas, S.; Florea-Burduja, E. Digital revitalization of popular port products. *Journal of Social Sciences* 2022, 5 (3), pp. 168-179. [https://doi.org/10.52326/jss.utm.2022.5\(3\).13](https://doi.org/10.52326/jss.utm.2022.5(3).13).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).14](https://doi.org/10.52326/jss.utm.2022.5(3).14)
UDC 37.04:005.966



PUPILS ATTITUDE TOWARDS DIDACTIC CAREER

Marianna Savva*, ORCID: 0000-0003-0618-5360

Moldova State University, 60 Alexei Mateevici str., MD-2009, Chisinau, Republic of Moldova

*Corresponding author: Marianna Savva, marianna.savva@usm.md

Received: 05.12.2022

Accepted: 17.13.2022

Abstract. In this article we present the results of a stage within a pedagogical experiment on improving the attitude of high school students towards the teaching career. Being a fairly current topic, but also quite complicated, based on the fact that it is a long process and it is difficult in a short period of time to form positive attitudes towards an activity, but this is not impossible. The attitude of the pupils towards the teaching career can be different, depending on many factors, from which its external manifestation in the form of opinion or actions, can be unstable and be different from each other. We assume that capitalizing on a model of guiding pupils in the teaching career would have a positive impact on the level of attitude of pupils towards the teaching profession. In this regard, in this article we mention the tools that have been applied in this regard, and have demonstrated their effectiveness with positive comparative values.

Keywords: *pupils, teaching career, motivation, attitude towards teaching career.*

Rezumat. În acest articol prezentăm rezultatele unei etape din cadrul unui experiment pedagogic privind îmbunătățirea atitudinii liceenilor față de cariera didactică. Fiind un subiect destul de actual, dar și suficient de complicat, reieșind din faptul că este un proces de durată și este dificil într-o perioadă scurtă de timp ca să formezi atitudini pozitive față de o activitate, dar, acest lucru nu este și imposibil. Atitudinea elevilor față de cariera didactică poate fi diferită, în dependență de foarte mulți factori, de aceea manifestarea ei exterioară sub formă de opinie sau acțiune, poate fi instabilă și să fie diferită una de cealaltă. Presupunem că valorificarea unui model de ghidare al elevilor în cariera didactică ar avea impact pozitiv asupra nivelului atitudinii elevilor față de profesia didactică. În acest sens, în acest articol menționăm despre instrumentele care au fost aplicate în acest sens, și și-au demonstrat eficiența obținând valențe comparative pozitive.

Cuvinte cheie: *elevi, carieră didactică, motivație, atitudinea față de cariera didactică.*

1. Introduction

Guiding pupils in teaching career is a topical issue for contemporary society, in the context of a rapid evolution of both professions in the labor market and the options of young people when choosing a future profession. Scientific documentation allows us to state that there are several studies and classifications of the reasons that determine the choice of a teaching career by pupils.

Motivation refers to the inner factors of the individual that stimulate, maintain and channel behavior in relation to a goal [1, p.381]. On the other hand, motivation refers to the influences that govern the initiation, direction, intensity and persistence of behavior [2, p. 431].

Attracting human resources in education, however, for the work at the department is not the only difficult aspect of the problems developed in our study. As we will detail later, we are dealing with extremely difficult issues, because it is important not only to make sure that graduates knowingly choose such a career, but - moreover - that the most valuable human resources are drawn to a teaching career [3, p.8].

In their research entitled „Teacher education in Singapore: What motivates students to choose teaching as a career?“, as a result of which they noted that there are generally three categories of reasons needed to pursue a teaching career:

(1) extrinsic motivation (including elements such as work remuneration and other benefits - such as the security offered by such a job); (2) intrinsic motivation (the joy of teaching and the school environment in which the instructive-educational process takes place); and (3) the altruistic aspects (the fact that the teaching profession offers the opportunity to become a decisive element in the life of young people, in the major decisions that the latter will take) [4].

One of the least important motivating factors is the pursuit of a teaching career due to the influence of others (it is interesting to note that if this is important for other careers - he did what his family told him for example, continuing a its tradition - in the teaching career is no longer significant). Between the two extremes were other motivations (which we find in most studies in the field: a positive experience with a teacher who thus served as a career model, the security offered by such a job, more time great to spend with family, etc.) [3, p.7]. Family traditions influence the choice of a career, and the father's model is decisive [5, p.57; 6, pp.69-70].

Having young children as their own “professional model” of success in their teaching career, in some cases children can imitate their parents' behavior, later embracing this profession. In addition to the benefits of the teaching profession that the child sees every day in his parents, or one of his parents who practice this profession, the professional parenting model can become a tool to influence the choice of future teaching career.

In the paper „Recruitment and retention: Insight into the motivation of primary trainee teachers in England“; The authors emphasize [7] that the main reason for pursuing a teaching career is the impact that this profession has on social dynamics. Regarding the study itself, the authors note several categories of factors, important for those who choose the teaching career, of these:

Pragmatic factors: extended vacations enjoyed by teachers; the fact that the teaching profession provides good job security; the ease with which you get this job, once you have the necessary qualifications.

Social factors: the support that the teaching profession offers to the progress of society; the fact that it is socially deserving to have such a profession; the teaching profession involves considerable variety and challenge, a wide variety of subjects can be taught.

Factors related to working with children: schools are pleasant jobs; the teaching activity itself is a pleasant endeavor; the pleasure offered by the activity with a specific age category (children); the desire to help students succeed.

Extrinsic factors: encouragement from others to pursue a teaching career; in the vision of some of those interviewed, the teaching career becomes a springboard for other careers;

the choice of the teaching profession is generated by the perception of the subjects that they are unable to follow another profession.

Subjective factors: previous experiences as a student generated the desire to be a teacher; passion for the field to be taught [8].

Thus, in an experiment we proposed as a research variable, the attitude of students towards the teaching profession as a motivating factor for choosing a teaching career.

2. Methods

In order to form the pupils' attitude towards the teaching career, were created situations and contexts in this sense. Thus, the formative pedagogical experiment was attended by 29 students of the 11th grade from the Public Institution Theoretical High School "Alexandru Ioan Cuza" who represented the experimental group, and another 29 students who represented the control group, of which 15 students from the Theoretical High School "Lucian Blaga", and 14 students from the Public Institution Theoretical High School "Princess Natalia Dadiani".

The content and the procedural dimension of the didactic orientation program in the career constituted training sessions in this respect, and on the other hand their involvement in a system of activities oriented towards the didactic career.

Ajzen consider that the evaluative dimensions of attitude can take many forms such as good-bad, harmful-beneficial, pleasant-unpleasant, and likable-dislikable [9].

In order to evaluate the pupils' attitude towards the teaching career, based on the questionnaire adapted from Ustuner M. [10], Tezci E. [11], Terzi A. [12] (the original version of the questionnaire contains 34 statements) we developed and applied a questionnaire consisting of 25 statements regarding the teaching profession. When preparing the questionnaire, we took into account the following aspects:

- ✓ *identifying a need* - due to the lack of such measuring instruments and the real need to prepare the questionnaire;
- ✓ *defining the objectives and indicators of the questionnaire* - we established the target group, so to whom it is addressed and why this questionnaire was chosen;
- ✓ *selection of a group of experts in this field* - allowed to make a first version of the questionnaire;
- ✓ *writing and composing items* - writing the actual questions;
- ✓ *field phase* - application of the questionnaire to real subjects from a certain target group, analysis of items;
- ✓ *revision of items* - analysis and structuring of items, elimination of incorrect ones (reformulation of some items);
- ✓ *preparation of the final version of the questionnaire* - the items are checked again;
- ✓ *establishing the rules of interpretation* - checking the fidelity and validity of the questionnaire.

The questionnaire "Pupils' attitude towards teaching career" was developed by the method of experts attended by 2 representatives from university, a statistician and a school manager.

Attitudes are generally thought to be reflected in behavior, but there are several factors that can disrupt this, namely:

- a) the influence of the immediate situation which involves numerous stimuli that act directly on the behavior;
- b) the action of several complementary or contradictory attitudes on the behavior;

c) the gap between the moment when we study the attitudes of a subject or a group and the moment when the real behavior is observed [13].

Based on this theoretical support, we aimed to evaluate not so much the direct behavioral aspect of the pupils, whether or not I would choose a teaching career?, but the intention (option) to choose this profession or teaching career?).

Between attitude and their external manifestations in the form of opinion or action, there isn't a perfect and unconditional compliance. This is evidenced by another perspective that questioned including the stability of attitudes. According to research authors Erikson, West Pines, Wilson quoted by H. Bloch et al. [14] the subject has a "database", a complex set of factors relevant information to form an attitude, but are only partially activated in attitudes [15].

Thus, we established 5 criteria of the attitude towards the teaching career, namely:

- ✓ Criteria I Compatibility with the teaching profession;
- ✓ Criteria II Attitude towards teaching;
- ✓ Criteria III Attitude towards the prestige of the profession;
- ✓ Criteria IV Attitude towards the working conditions of the teaching profession;
- ✓ Criteria V Attraction to the teaching profession.

Pupils ticked each statement that matched their opinion, giving 5 points for Total agreement, 4 points for Agreement, 3 points for Indifference, 2 points for Disagreement and 1 point for Total Disagreement (Linkert Scale). Following the addition of the score obtained for each statement in the questionnaire out of the 25, each pupil obtained a general score that represents the level of attitude that the pupil has towards the teaching career.

3. Results

In order to evaluate the efficiency of the pupil guidance program in the teaching career, we performed the control stage within the pedagogical experiment carried out. To achieve the goal proposed at this stage, we applied to pupils - similar experimental group, questionnaire to assess attitudes towards teaching, the method of analysis was the pair test - the test to determine the average differences before and after the intervention.

We used the t test for the paired samples to assess the statistical significance of the differences between the means for two sets of scores. In our case, highlighting the differences and statistical significance even after the intervention through training activities demonstrates the impact that the training program had on the development of pupils on certain indicators of research variables. In the table below we present the comparative results obtained by the experimental group, before and after the training experiment.

Table 1

The results of the experimental group on the attitude towards the teaching career, pre and post training program

	Criteria	Mean	N	Std. Deviation	Std. Error Mean
Criteria 1	compatibility with the teaching career	18.41	29	3.905	.725
	post compatibility with the teaching career	22.55	29	2.886	.536
Criteria 2	attitude towards teaching	9.21	29	1.897	.352
	post attitude towards teaching	10.41	29	1.597	.297

Continuation Table 1

Criteria 3	attitude towards the prestige of the profession	16.03	29	2.556	.475
	post attitude towards the prestige of the profession	16.10	29	3.016	.560
Criteria 4	attitude towards working conditions	15.76	29	2.824	.524
	post attitude towards working conditions	19.93	29	1.963	.364
Criteria 5	attraction for the teaching career	13.03	29	1.569	.291
	post attraction for the teaching career	14.76	29	1.504	.279
Total average	pre	72.45	29	6.484	1.204
	post	83.48	29		

At the pre-experiment stage at criteria 1, the compatibility with the teaching profession was obtained with a coefficient of 18.41. Obtaining a score of 22.55 post-experiment, shows us that following the involvement of pupils in career-oriented activities, some pupils found that their personality qualities are compatible with the qualities of a teacher, that they may have a predisposition, a penchant for teaching, that the teaching profession is suitable for some of the pupils, that their personality corresponds to the requirements of the respective profession and that they can be successful in choosing this profession, and that they like to converse with people who work in this field. Regarding the attitude towards teaching, the pupils recorded pre-experiment 9.21 and post-10.14.

This criteria has been slightly improved compared to the other criteria. Thus, we can say that regardless of the involvement in the activities of the training program, it remains a less influenced aspect by this, and the difference of 0.93 is accumulated from the fact that some pupils mentioned that they obtained satisfaction after being involved in the system of activities oriented towards the didactic career.

Regarding the pupils' attitude towards the prestige of the profession, this criteria remains unchanged, being obtained before 16.03 and after 16.10. This explains why involvement in certain activities cannot in any way influence the attitude towards the prestige of a profession and that it actually depends on other major dominant factors, such as the perception of members of society about this profession. What is certain is that the change in pupils' attitude towards the prestige of a profession takes a long time, and cannot be so easily influenced only by activities at the level of a doctoral research, but by concrete actions at the level of society, members of society, family, school, group. of friends, community. At criteria 4, the attitude towards working conditions, we attest a major improvement of the coefficients, from 15.76 pre-experiment to 19.93. With such a result, we can say that as a result of this involvement of the pupils, also having the direct role of teacher, they discovered that they will be able to overcome the difficulties in this profession, that eventually they could face a more demanding work schedule, that the lack of financial incentives would not prevent them from working in the teaching profession and that they could adapt to these working conditions.

The last indicator of the attitude towards the teaching career, the attraction towards this profession, we attest that the students enrolled in the pre-experimental stage 13.03 and in the post-14.76 stage.

This shows that the pupils who participated improved their attitude towards the idea of becoming teachers and changed their attitude towards the choice regarding the choice of a teaching career.

In short, in the experimental sample we obtained significant differences before and after the intervention through the training activities, namely:

- The average for the variable compatibility with the teaching profession up to the training program (M (mean preexperiment)=18.41, SD (Std. Deviation)=3.90) and after the training program (M (mean postexperiment)=22.5, SD =2.88), differs significantly (t = -6.59, DF =28, p =0.000).

- The average for the variable attitude towards teaching up to the training program (M =9.21, SD =1.89) and after the training program (M =10.14, SD =1.59), differs significantly (t = -4.70, DF =28, p =0.000).

- The average for the variable attitude towards working conditions up to the training program (M =15.76, SD =2.82) and after the training program (M =19.93, SD =1.96), differs significantly (t = -7.60, DF =28, p =0.000).

- The average for the variable attraction towards the teaching profession up to the training program (M =13.03, SD =1.56) and after the training program (M =14.76, SD =1.50), differs significantly (t = -7.42, DF =28, p =0.000).

- The total average up to the training program represents M = 72.45, after M =83.48.

In the figure below, we also represent how the pre- and post-experiment research variable has changed.

It is certain that in a short time you cannot radically change attitudes, but at least we can improve its values.

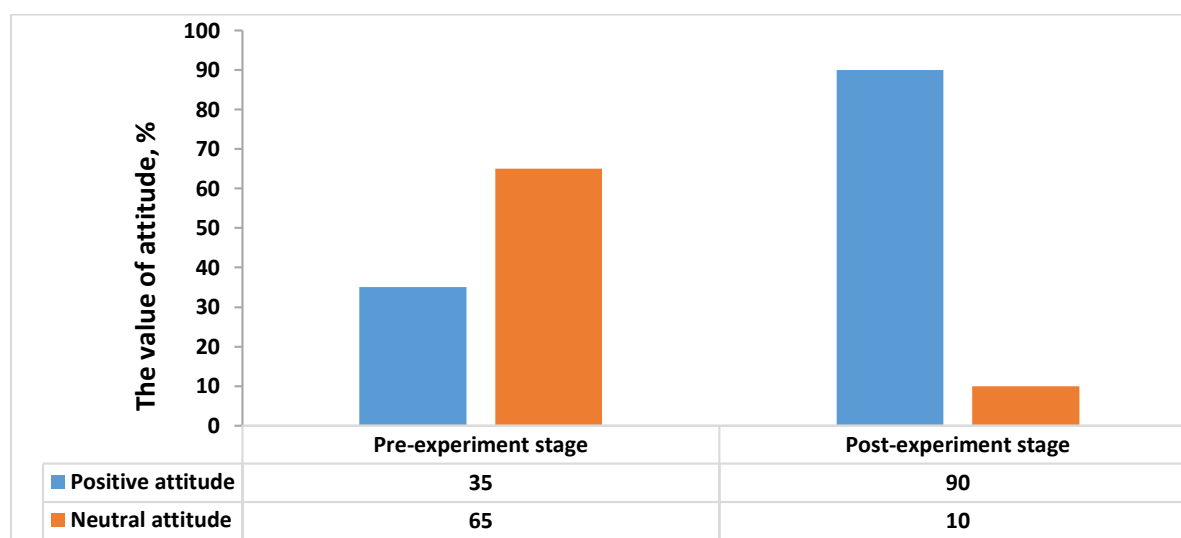


Figure 1. Modification of the research variable at the pre- and post-experiment stage.

5. Conclusions

Analyzing the results of the statistical processing, we obtained the following correlations from the pupils of the experimental group:

- There is a significant positive relationship between the attraction to the teaching profession and the compatibility with the teaching profession (r = 0.481, DF =29, p =.008), as the attraction for the teaching profession increases, so does the compatibility with the teaching profession.

– There is a significant positive relationship between the attitude towards teaching and the attraction towards the teaching profession ($r= 0.525$, $DF=29$, $p=.003$), with the increase of the attitude towards teaching, the attraction towards the teaching profession also increases.

– There is a significant positive relationship between the attitude towards the prestige of the profession and the attraction towards the teaching profession ($r= 0.418$, $DF=29$, $p=.024$), as the attitude towards the prestige of the profession increases, so does the attraction towards the teaching profession.

– There is a significant positive relationship between the attitude towards working conditions and the attraction towards the teaching profession ($r= 0.381$, $DF=29$, $p=.042$), as the attitude towards working conditions increases, so does the attraction towards the teaching profession.

From a statistical point of view, it has been shown that there is a positive relationship directly proportional to the attitude towards teaching and the attraction towards the profession, with the increase of the attitude towards teaching increases and the attraction towards the teaching profession. The more the pupils became involved in the system of activities oriented towards the teaching career having the direct role of teacher, the more they are attracted to choose this profession. Being the direct actors in those situations and direct experiences, changing their attitude towards the working conditions, both increases the attraction towards the teaching profession.

Conflicts of Interest. The author declares no conflict of interest.

References

1. Huffman, K.; Vernoy, M.; Williams, B.; Vernoy, J. *Psychology in action*. Ed. John Wiley and Son, New York, 1991, 710 p.
2. Bernstein, D.; Roy, E.; Srull, Th.; Wickens, C. *Psychology*. 2nd ed. Boston: Houghton Mifflin Company, 1991. p. 53.
3. Pânișoară, I.O.; Pânișoară, G. *Motivarea pentru cariera didactică*. București: Editura Universității din București, 2010. 54 p. Available online: <https://performante.ro/wp-content/uploads/2012/12/motivarea-pentru-cariera-did-panisoara-1.pdf> (accessed 15.12.2018).
4. Goh, K.C.; Lourdusamy, A. Teacher education in Singapore: What motivates students to choose teaching as a career? In *Paper presented at the AARE Conference*, Fremantle, Australia, 2001. Available online: <https://www.aare.edu.au/data/publications/2001/atp01460.pdf> (accessed 14.04.2022).
5. Axinte R. *Student career counseling. Constructivist perspectives*. Ed. Universității „Al. Ioan Cuza”, Iași, 2018, 245 p. [in Romanian].
6. McClain, M.C.; Melvin B. *Family factors in career decision making: Application of Cognitive Information Processing (CIP) Theory*. Available online: https://career.fsu.edu/sites/g/files/upcbnu746/files/files/tech-center/nca-presentations/2012/201206_4-8FamilyFactors_Handout.pdf (accessed 14.04.2022).
7. Troman, G.; Woods, P. Careers under stress: teacher adaptations at a time of intensive reform. *Journal of Educational Change* 2000, 1, pp.253-75.
8. Bujor, L.; Schipor, M.D. Attitude Towards Teaching Career - Initial Assessment of First Year Students. In: *Proceedings of the 13th edition of the International Conference on Sciences of Education*, Suceava, 28-29 May 2015. Education and Development, Research and Practice (EDRP), 2015, 2(1), pp. 1-8.
9. Ajzen, I. Nature and Operation of Attitudes. *Annual Review of Psychology*, 2001, 52, pp. 27-58.
10. Ustuner M. Reliability and validity of the Attitude Scale Towards Teaching Profession. *Educational Administration: Theory and Practice* 2006, 12, pp. 109-127.
11. Tezci, E.; Terzi, A.R. An examination on the attitudes towards teaching profession of the students of secondary school branch teacher training programs. *e-Journal of New World Sciences Academy* 2010, 5 (2), pp. 367-388.
12. Terzi, A.R.; Tezci, E. Attitudes towards teaching profession of the students of Necatibey Faculty of Education. *Educational Administration: theory and practice* 2007, 13, pp. 593 - 614.

13. Munteanu, T. *Formation of moral attitudes in children within the family*. Doctoral thesis in pedagogical sciences. Chişinău, 2019, 201 p. [in Romanian].
14. Bloch, H. *Larousse, The Great Psychology Dictionary*. Bucharest: Trei, 2006.
15. Ajzen, I.; Fishbein, M. *Understanding Attitudes and Predicting Social Behavior*, Englewood Cliffs, N.Y.: Prentice-Hall, 1980.

Citation: Savva, M. Pupils attitude towards didactic career. *Journal of Social Sciences* 2022, 5 (3), pp. 180-187. [https://doi.org/10.52326/jss.utm.2022.5\(3\).14](https://doi.org/10.52326/jss.utm.2022.5(3).14).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md

[https://doi.org/10.52326/jss.utm.2022.5\(3\).15](https://doi.org/10.52326/jss.utm.2022.5(3).15)
UDC 343.352:332.012.3(594)



THE URGENCY OF CRIMINALIZATION OF BRIBERY IN THE PRIVATE SECTOR AS A CRIMINAL ACTION OF CORRUPTION IN THE CORRUPTION LAW

Resmen*, ORCID: 0000-0003-2893-0552,
Abdul Madjid, ORCID: 0000-0001-5056-5673,
Faidzin Sulistyo, ORCID: 0000-0001-8685-1575,
Reka Dewantara, ORCID: 0000-0002-6010-0279

Faculty of Law, Brawijaya University, Jakarta, Indonesia

*Corresponding author: Resmen, resmen.ub@gmail.com

Received: 07. 30. 2022

Accepted: 08. 26. 2022

Abstract. The purpose of this study is to examine the philosophical basis, the urgency of regulating bribery as a criminal act of corruption and reformulating the regulation of bribery as a criminal act of corruption in the future. This study applies normative legal research, using a normative juridical approach, using analysis techniques of legal materials obtained from research, examined, to be compiled systematically and presented in descriptive sentences. The results of the study indicate that the cause of the weakness of the corruption law is due to the absence of norms (vague of norms) from the perpetrators of corruption crimes committed other than the government. That every private actor in committing a criminal act of corruption is required to have joint participation with state officials (state apparatus), other than that it is not a criminal act of corruption, even though the consequences of that act have caused state financial losses or very large state economic losses. This study focuses on legal subjects, legal acts and criminal sanctions (penal) which are more open in order to achieve fair legal certainty against bribery by private to private actors, thus there is a need for new regulatory arrangements regarding private to private bribery. as a criminal act of corruption in Indonesia.

Keywords: *corruption, bribery, private sector, UNCAC, state finance.*

Rezumat. Scopul prezentului studiu este de a examina baza filozofică, urgența reglementării mitei ca act penal de corupție și reformularea reglementării mitei ca act penal de corupție în viitor. Studiul aplică cercetarea juridică folosind o abordare juridică normativă și utilizând tehnici de analiză a materialelor juridice obținute în urma cercetărilor, examinate pentru a fi compilate sistematic și prezentate în propoziții descriptive. Rezultatele studiului indică faptul că motivul slăbiciunii legii corupției se datorează absenței unor norme (norme vagi) vis-a-vis de autorii infracțiunilor de corupție săvârșite în afara guvernului. Fiecare actor privat în comiterea unui act penal de corupție este obligat să participe în comun cu funcționarii statului (aparatul de stat), cu excepția faptului că nu este un act penal de corupție, chiar dacă consecințele aceluia fapt au cauzat pierderi financiare de stat sau pierderi economice foarte

mari ale statului. Acest studiu se concentrează pe subiectele juridice, actele juridice și sancțiunile penale (penale) care sunt mai deschise pentru a obține o securitate juridică echitabilă împotriva luării de mită de către actori privați către privați, astfel că este nevoie de noi aranjamente de reglementare privind mita de la privat la privat, ca act criminal de corupție în Indonezia.

Cuvinte cheie: *corupție, mită, sector privat, UNCAC, finanțe de stat.*

1. Introduction

Corruption in human history is nothing new. It was born at the same time as the human age itself. The United Nations (UN) noted that corruption is a serious crime that can weaken social and economic development at all levels of society [1]. The massive corruption of the world has become a special international concern, this can be seen by the problem of corruption always being a special topic. UNODC (United Nations Office on Drug and Crime) in 2003 then produced a recommendation in the form of a convention called the United Nations Convention Against Corruption (UNCAC) [2]. The constitutional practice in Indonesia in ratifying an international convention is formulated in Law Number 24 of 2000 concerning international treaties, however, it is emphasized that the ratification of the agreement based on the law is only a form of "approval" from the House of Representatives (DPR), as has become a requirement of the constitution. Article 11 of the 1945 Constitution of the Republic of Indonesia.

Some of the cases that the author can bring up in this writing include acts that are categorized as bribery between the private sector and private business entities as contained in the online news investment report Indonesiana quoted from Tempo magazine's investigation that 40% of drug prices are used to bribe doctors. Other cases can also be seen from the differences in interpretation regarding State Enterprises (BUMN) and SOE subsidiaries, some experts argue that the finances of SOEs and SOE subsidiaries have entered the private sphere [3]. Another example, related to inter-club soccer match-fixing bribery that is rife nowadays affecting PSSI, which investigators only suspected with the Law of the Republic of Indonesia Number 11 of 1980 concerning the Crime of Bribery, the Act on the crime of bribery does not include in corruption, because the perpetrators are not civil servants, state administrators, state financial managers [4].

The author finds the philosophical problems of the Anti-Corruption Law ontologically on what is the meaning of the private sector and the limits of state losses. The juridical problem in the author's view is that there is a Vague of norm against bribery committed between private actors and private actors. Law No. 31 of 1999 in conjunction with Law No. 20 of 2001 concerning Corruption has created legal uncertainty, especially in the case of perpetrators who are subjects of corruption crimes who bribe the private sector. This legal uncertainty is suspected to have a wide impact on aspects of the economic life of the country and society as parties who feel the justice, and it will result in not achieving the conditions envisaged by Law no. 31 of 1999 concerning the Eradication of Corruption Crimes. Furthermore, the theoretical problems on the concept of state financial limits and private sector corruption, the authors find that there are acts of corruption committed by the private sector which do not exist in the current corruption law but in other laws regulate the acts of corruption in the private sector. These other laws do not take into account the aspects of state economic losses as an element of the fault of the private actors, even though there have been losses to the state economy, so in this case the legal concept must really be carried out

in order to realize the framework for the orderly passage of people's lives. Based on this description, this research was conducted to determine the urgency of the Criminalization of Bribery in the Private Sector as a Corruption Crime in the Corruption Act.

2. Research Methods

This type of research is normative legal research, namely research that examines legal issues from the point of view of legal science in depth against established legal norms [5]. Some of the approaches used include the statutory approach, the concept approach, the historical approach and the comparative approach. The purpose of using a statutory approach is to find out whether the regulations that regulate have been arranged comprehensively, hierarchically, systematically and logically and have been able to accommodate the legal needs that exist in society [6]. The conceptual approach used is to remember the approach that will be used to analyze problems for which there are no or no legal regulations [7]. The historical approach is used considering that the regulation of criminal acts of corruption has been regulated for a long time, while the comparative approach, intended by the author is to compare events that are included in the acts of corruption in UNCAC 2003 that occurred in Indonesia, but are not in the realm of corruption. in Indonesia by taking the basis of comparison in several countries, in this case Singapore and the Netherlands.

The legal materials used in this study are primary legal materials (legal materials consisting of legal norms relating to the issues discussed), secondary (legal materials that provide explanations of primary legal materials and those relating to evidence, including explanations of statutory regulations, literature, journals, court documents and so on), and tertiary (legal materials that provide explanations for primary and secondary materials such as the English-Indonesian Dictionary; Black's Law Dictionary; and the Dutch-Indonesia Dictionary).

Legal materials collection techniques are carried out by means of documentation studies or literature studies, both through electronic media and all other library media. The analytical method used in this study is a qualitative juridical analysis. Qualitative juridical analysis method is a research procedure that produces descriptive data. Normative legal research that uses secondary data, research is generally descriptive or descriptive-explorative and the analysis is qualitative based on a theoretical framework that has been prepared using deductive logic of thinking [8].

3. Results and Discussion

3.1 The urgency of the philosophy of criminalizing private sector bribery in the corruption crime act

Currently, the Anti-Corruption Law only accommodates the eradication of corruption in the public sector, the eradication of corruption only prioritizes public actors and only on elements of state losses as a result of losses arising from such acts of corruption, so that it can be calculated by the BPK or anti-corruption agency in determining the value of the state finances loss. However, for acts of corruption committed by private to private actors that result in losses to the state economy, until now it is not a category of acts of corruption according to this Corruption Act, even though the state's economic losses are greater than the financial losses of the state itself. The current Corruption Law is completely unable to enforce the law in the event that the perpetrator is private to private, because private to private actions in this case are still seen as civil acts, administrative acts or are general

criminal acts, so they do not look at private sector corruption. This is an extraordinary crime, as is the case with the corruption law.

The current Corruption Act, Law no. 31 of 1999 concerning criminal acts of corruption as amended and supplemented by Law Number 20 of 2001 concerning amendments to Law Number 31 of 1999 does not at all mention the existence of private to private corruption. The main requirement for a criminal act of corruption is that the perpetrator of the criminal act of corruption is someone who is authorized by law to be responsible for mere public affairs. Therefore, the consequences of acts of corruption in the form of harming state finances or harming the country's economy are the main requirements for the perpetrator to be declared a criminal act of corruption. As in the current Anti-Corruption Law, even though there are state financial losses or state economic losses caused, there will be no accountability in the event that corruption is committed by private to private.

Therefore, the author is of the opinion that the Anti-Corruption Law currently has a narrow concept of defining corruption itself, because it limits the act of corruption only to those who are given the task by law to carry out the task authority and the public interest can only be reached as a member of the public perpetrators of corruption, but not for private actors. The impossibility of corruption in the private sector to be ensnared by the Anti-Corruption Law is due to the absence of a definition of corruption in the Anti-Corruption Law, even the Anti-Corruption Law limits corruption to any act that is categorized as a criminal act of corruption in the articles of corruption, so that only Explaining corruption based on the types of corruption crimes only, it results in the narrow meaning of the criminal act of corruption itself based on laws determined by the state, so that the understanding of corruption becomes much narrower than the actual crime of corruption that applies internationally [9].

Private actors, where private-to-private bribery acts in committing acts of bribery corruption are completely untouched by Law No. 31 of 1999 as amended and added to Law no. 20 of 2001 concerning amendments to Law No. 31 of 1999 concerning the Crime of Corruption. This happens because the Anti-Corruption Law currently only provides criminal sanctions against public actors who commit criminal acts together with private actors, or it can also be that both perpetrators are public actors, in the sense that the actions of private actors can only be punished as a party who participates in doing together with public actors or what is known as *delneeming*, in the general provisions of the Criminal Code, the position of private actors in this case is positioned as a party or actors participating together with public actors, thus cannot be positioned as the main actor in committing corruption crime.

This is a legal norm stated in Article 55 paragraph 1 1 of the Criminal Code, which reads "Criminalized as perpetrators of criminal acts are those who commit, who order to do, and who participate in committing the act". Thus, based on the norms contained in Article 55 paragraph 1 to -1 of the Criminal Code, in terms of the relationship between each actor in resolving the criminal act of corruption, according to the author, participation can only be done in 3 (three) ways, namely:

Jointly commit acts of corruption;

- a. A person has the will and plans a crime while he uses other people to carry out the crime of corruption;
- b. Only one person carries out the crime of corruption, while other people help carry out the crime of corruption.

Guided by the concept of *Stufenbau* theory presented by Hans Nawianski as the author mentioned above, *stuffend*-theory is a concrete process or a process of concretizing a norm. The hierarchy in the *stuffend*-theory is arranged starting from the ground norm, the basis for the application of the norm to the judge's decision, which is a very concrete norm. Sollen applies on the basis of another higher sollen, the law applies on the basis of a higher sollen. The ground norm is not held, but assumed (*voraus gesetzt*), meaning that by following the legal certainty theory presented by Hans Kelsen, the ground norm is assumed to be the basis of the conditioned *stufen* (level), in this case the bribery corruption committed private actors together with other private actors if observed, at this time it is still a ground norm, applies is a prohibition against everyone without any distinction, may not commit acts of corruption, but the corruption norms do not provide uniform sanctions against the perpetrators, still there are acts of corruption that are not subject to sanctions for criminal acts of corruption even though they are seen as acts of corruption, namely acts of corruption in the private sector.

Although there is an act of corruption in the private sector but it is not seen as a criminal act of corruption, so that there is no criminal sanction against the act of corruption, only bribery is not categorized as corruption, as stated in the explanation of LAW No. 11 of 1980 concerning Acts of The crime of bribery, thus the act of corruption in the private sector in Indonesia is currently still in the form of Corruption, has not become a law because acts of corruption are in an abstract position with the absence of sanctions for corruption in the private sector.

The rule of law on corruption as a legislative product that reflects the rule of law (supremacy of law) as a norm which is sanctioned by the legislative product only emphasizes the prohibition of committing criminal acts of corruption to state administrators, state apparatus and state financial management bodies. In the event of corruption committed by private to private actors, even though the act is seen as an act of corruption, it is only an abstract norm because there is no affirmation in the law that the act is corruption, thus the act cannot be sanctioned for committing a criminal corruption act by Judge.

Although there are judges' interpretations of certain cases carried out by private actors, both interpretations of constitutional judges, or adjudicating judges for acts of corruption, these interpretations still reflect legal uncertainty, because these decisions are made in cases that are gray in the law as in the case of The law on BUMN and BUMN Subsidiaries which is debated by experts is in the realm of private or public law, so that judges based on their authority in the form of giving independent judges' decisions and judges are not obliged to follow the decisions of previous judges giving various decisions on the position of BUMN and its subsidiaries The BUMN, as well as the function of an independent judge in order to enforce law and justice based on Pancasila, for the sake of the implementation of the legal state of the Republic of Indonesia as regulated in Article 1 of Law no. 48 of 2009 concerning Judicial Power. The freedom of judges in deciding cases against uncertain rules also creates legal uncertainty.

Regarding legal certainty compared to legal norms, Hans Kelsen argues that law is a system of norms. Norms are statements that emphasize aspects of "should" or *das sollen*, by including some rules about what must be done. Norms are the product of deliberative human action. Laws containing general rules serve as guidelines for individuals to behave in society, both in relation to fellow individuals and in relation to society. These rules become limitations for society in burdening or taking action against individuals. The existence of these rules and the implementation of these rules give rise to legal certainty [7].

In relation to corruption as a value that is seen as wrong or despicable by the community, the authors view that corruption is a moral norm, where the moral norm of corruption is something that is forbidden to do and is seen as detrimental to the general public even though there is no law prohibiting it thus bribery is the moral norm of corruption. The author's opinion is in line, quoting the opinion of Ackerman, that the level of corruption is also determined by the risks calculated by the perpetrators. Furthermore, it is said that the level of corruption is a function of honesty and integrity, both for public officials and private circles. If these two factors are constant, then the measure of the level of corruption including bribes and kickbacks is determined by the overall level of profit to be obtained, the risk and the relative bargaining power of the parties involved, for example, those who take bribes and accept bribes. If bribery is highly likely to be uncovered, or corrupt behaviour can be uncovered, including severe penalties, then fraud may not be committed [10].

That corruption is currently only a moral norm, because bribery is seen as an act that is against the law and harms the interests of many people but cannot be sanctioned with corruption because legal norms provide different meanings of bribery. Corruption in laws and regulations never defines the meaning of corruption in its entirety, the legal norm of bribery as corruption is only part of the types of corruption crimes, thus outside of the provisions of the law, corruption does not become a corruption crime. Thus the legal norm of bribery as corruption in terms of corruption has narrowed the meaning of corruption itself by only making bribery in the public sector a criminal act of corruption.

In this case, there are conflicts between norms of the same normative order, especially a legal order regarding bribery as corruption and bribery as a non-corruption norm, which has been discussed previously. This shows that there is a conflict between the norm of corruption as a legal order and a norm of corruption as a moral order, so with the existence of two legal norms that view the norm of corruption as moral, it loses its validity, although the rule of law cannot determine that corruption is a moral norm in conflict with the legal norms will lose their validity. Thus, derogation is needed because there are two legal norms that are equally applicable but do not reflect the moral norms against corruption.

Therefore, the existence of these two conflicting bribery legal norms creates legal uncertainty. Referring to the opinion of Gustaf Radbruck, the author views that the law that has succeeded in guaranteeing a lot of legal certainty in society is a useful law, that is what Gustaf Radbruck calls "legal certainty". Thus, with legal certainty because of the law, it will be able to guarantee legal justice and the law must remain useful. But at this time what is happening is "legal certainty in law" where the law is formed as many laws as possible, but in these laws there are provisions that contradict the logic of the system. Laws are made based on *rechtswerkelijkheid* (true legal conditions) and in these laws there should not be acceptable terms.

Based on the concept of legal certainty, the author argues that a legal certainty is needed regarding the norm of bribery as a non-corruption crime. The author agrees with John Austin's opinion that requires legal positivism in order to achieve legal goals, namely certainty where to achieve legal certainty it is necessary to separate law from morals so as to produce a logical, permanent, and closed logical system. Therefore, to avoid conflicts in legal norms related to bribery, it is necessary to positive bribery as a criminal act of corruption, so that there is no difference in the norms of bribery as it is today, where the bribery norms contained in the corruption law cannot be enforced. When the corruption is carried out by

the private sector, because there are restrictions made by the Bribery Act, in the case of bribes committed outside the corruption law, the bribe can only be sanctioned by the bribery law.

In creating legal certainty because of the law, as stated by Gustaf Radbruck, a legal positivism is needed by implementing a criminal law policy, to form a legal regulation related to bribery, where bribes do not provide a separate interpretation with the benchmarks of actions committed by the person or the person, as is the case with the bribery law and the current corruption law, so that it does not provide a legal certainty regarding what bribery itself says.

Ratification of the United Nations Convention Against Corruption (UNCAC) in 2003 which was further ratified by Law No. 7 of 2006 concerning Ratification of the United Nations Convention Against Corruption, 2003, which in his explanation stated that so far the prevention and eradication of corruption in Indonesia has been carried out based on special laws and regulations that have been in effect since 1957 and have been amended 5 (five) times, however, these laws and regulations are not adequate, partly because there is no international cooperation in the matter of returning the proceeds of corruption. In this case, the ratification is also guided by the Bali convention which requires the establishment of technical cooperation and exchange of information in the prevention and eradication of corruption under the umbrella of economic development cooperation and technical assistance at bilateral, regional and multilateral levels; and harmonization of national legislation in the prevention and eradication of corruption in accordance with this Convention.

In UNCAC provisions also regulate private sector bribery as a criminal act of corruption as regulated in article 21 UNCAC 2003, the principle of international law does not separate corruption committed by private to private, or public to private or private to public, thus the norm of bribery is seen as a criminal act corruption by the UN convention. Because there has been a ratification of the corruption norms in UNCAC 2003 into the ratification law, normatively there is a lack of norms in Law No. 11 of 1980 concerning bribery and Law No. 31 of 1999 in conjunction with Law No. 20 of 2001 concerning the eradication of Corruption, and with the lack of legal norms, of course, to create legal certainty for different norms, changes are needed from the current bribery legal norm to adapt to the existing legal norms in Law No. 7 of 2006 concerning Ratification of the United Nations Convention Against Corruption, 2003 as a mandate for harmonization of national laws and regulations in the prevention and eradication of corruption in accordance with this Convention (UNCAC 2003).

3.2 Juridical urgency criminalization of bribery in the private sector in the corruption act

Besides regulating active and passive bribery related to public officials (national public officials), UNCAC also regulates active and passive bribery in the private sector as regulated in Article 21. Regulations relating to corruption in the private sector also contained in several regional conventions such as the Council of Europe Criminal Law Convention on Corruption and the African Union Convention on preventing and combating corruption [11]. However, globally, the regulation of bribery in the private sector is a new thing when compared to the arrangements in other UN international instruments.

Article 21 shows the importance of the need for integrity and honesty in carrying out economic, financial or commercial activities. With the regulation on bribery in the private sector, it supports the development of the current trend of privatization. The development of

the private sector has resulted in services to the public in the form of products and services that are no longer solely carried out by the government or state business entities. The private sector then began to compete and provide services to the public. In such circumstances, it is important not to distinguish between the public and private sectors as part of an anti-corruption policy. Whereas corruption basically can not only occur in the public sector, the private sector is also inseparable from acts of corruption, even the consequences of private sector corruption are far more touching and have a bad influence on the community's economy.

In line with this, the UNCAC Legislative Guide emphasizes that the existence of Article 21 of UNCAC helps to protect integrity and honesty in economic, financial or commercial activities. Furthermore, corruption cannot be limited only to certain sectors in society but tends to develop and can occur in various sectors. This is due to the dependence of various kinds of activities that exist in social life. If corruption in the private sector develops, it will also indirectly have an impact on society and the public sector. At the state level, corruption deters investment, erodes competition, negatively affects the quality of public services, undermines citizens' trust in state institutions, exacerbates inequality, and ultimately jeopardizes political [12].

This is a special concern for countries where the public sector and the private sector of the country play an equally dominant role as well as for countries with the private sector which is experiencing development in economic, financial, or commercial activities. When someone who is trusted to be a decision-maker in a private entity has not been equated with a state official, then the corrupt act committed by the private party is considered a legal thing so that forever it will not be punished and eradicated as public officials who are threatened with criminal penalties. Based on Article 21 of UNCAC itself, in summary, state parties are recommended or required to consider determining as a criminal offense regarding:

- a. the promise, offer, or giving of an undue advantage to a person who leads or works in a private sector entity, for that person to act or refrain from acting in a way that violates his obligations, and
- b. the solicitation or receipt of an undue advantage by a person who leads or works in a private sector entity, in order for that person to act or refrain from acting in a way that violates his or her obligations.

From the provisions of the article, it is qualified as an active bribery act (a) and a passive bribe (b). In addition to regulating criminalization, UNCAC also regulates bribery prevention in the private sector as stated in Article 12 concerning the Private Sector. Article 12 is intended to prevent parties in the private sector from being involved in acts of corruption. The provisions in this Article are divided into four paragraphs. The first paragraph contains three provisions. First, state parties are required to make rules to prevent acts of corruption committed by the private sector. Second, state parties are required to have regulations to improve accounting and auditing standards in the private sector. Third, state parties must provide sanctions in the form of administrative sanctions or criminal sanctions for violations of established accounting and auditing standards.

Paragraph 1 is a mandatory provision, however, state parties still have the freedom to adjust the rules that will be made with the basic principles of the national law of each country. Paragraph 2 of Article 12 contains examples of actions that can be taken by the State to support the achievement of the things that have been regulated in the provisions in paragraph 1. Actions that can be taken include encouraging cooperation between law

enforcement officials and private entities, encouraging the development of standards and procedures by regulating codes of ethics and so on, encouraging transparency in private sector entities, preventing abuse of power in private entities by making rules, preventing conflicts of interest, and ensuring private companies have adequate internal audit controls.

Paragraph 2 is a non-mandatory measure which means the State can choose not to adopt it. Paragraph 3 is a mandatory provision. The provisions in this paragraph are basically taken from Article 8 (which regulates the accounting) of the OECD Anti-Bribery Convention. In paragraph 3 state parties are required to prohibit certain actions that are carried out with the aim of violating UNCAC provisions. These actions include off-bookkeeping records, off-bookkeeping records of transactions made, unrecorded expenses, use of forged documents, and intentional destruction of bookkeeping documents.

Paragraph 4 requires state parties to prohibit tax deductions from the proceeds of bribery. Meanwhile, in the Indonesian laws and regulations, bribery is basically regulated in Law Number 11 of 1980 concerning the Crime of Bribery. The law is formulated regarding the prohibition of giving or receiving bribes. The regulation on the prohibition of bribery in the Law on the Crime of Bribery is regulated in two articles, namely Article 2 and Article 3. Based on the article, the legal subject that is regulated is anyone. This has the consequence that anyone can be snared by this Article.

This is different from the Corruption Law which limits certain legal subjects, namely those relating to civil servants or state administrators, judges, and advocates as recipients of bribes. If it does not meet these provisions, then the Anti-Corruption Law cannot be used to ensnare an act of bribery. Another difference is that the Anti-Corruption Law has regulated the legal subject of corporations or *rechtspersoon* while the Bribery Law has not included corporations as legal subjects that can be charged with the Act. This has the consequence that corporations cannot be subject to criminal penalties in the context of the Criminal Act of Bribery. This then became one of the weaknesses of the Law on the Crime of Bribery to be able to ensnare bribers in the private sector. In addition, Articles 2 and 3 of the Law on the Crime of Bribery, which regulates active and passive bribery, state that the giving and receiving of bribes, with elements of *dolus and culpa* when giving or receiving bribes, is always accompanied by the phrase "regarding the public interest". In the explanation of the Law, it is emphasized by stating "... then bribery in various forms and in nature needs to be prohibited, however it is necessary to have restrictions, which are limited to acts of bribery involving the public interest" [13].

The phrase of public interest is also found in Article 310 (3) of the Criminal Code, which states that if the defendant commits it in the public interest, the provisions regarding (oral) or written pollution do not apply to him. The public interest phrase in the Article is thus a basis for abolishing the crime of "*strafuitsluitingsgrods*". In contrast to Law Number 11 of 1980 where the public interest based on the Act is used as a test-criterum, whether there is bribery according to the Act. If there is no public interest factor in activities that give rise to bribery, then this is precisely what creates a "*strafuitsluitingsgrods*" for bribery.

3.3 The practical urgency of criminalizing private sector bribery in the corruption crime act

In Indonesia, the magnitude of corruption that occurs in the private sector is actually well understood and occurs a lot in the business world and the country's economy, and law enforcement officials also know this condition. The amount of corruption in the private sector

is in line with the amount of money or business turnover in the sector. If the State Revenue and Expenditure Budget (APBN) is 2,000 trillion, then the money in this sector reaches more than 10,000 trillion, taking into account Indonesia's annual gross domestic product.

In handling it, corruption in the private sector is mostly handled internally by companies with sanctions such as refunds or dismissals [14]. The Indonesian government has made efforts to prevent corruption in the private sector. Prevention of corruption in the private sector that has been included in Presidential Instruction Number 10 of 2016 is the implementation of an anti-bribery management standard in the form of ISO 3700 [15]. This International Standard establishes requirements and guidelines for developing and implementing an anti-bribery management system applicable to public, private, and not-for-profit sector organizations. However, the government's efforts did not run optimally. This is due to the lack of private companies that apply the SNI ISO 37001:2016 standard regarding the Anti-Bribery Management System [16].

Based on investigations from tempo, the alleged bribery case of the private sector is the case of PT Interbat where PT Interbat is suspected of bribery to several hospitals and doctors. One of the parties who received the bribe was the Metropolitan Medical Center (MMC) Hospital which is a private hospital and the doctors who worked at the hospital. MMC Hospital has received money from PT Interbat four times totaling 253 million. The funds went through the account of Robby Tandiar, President Director of PT Kosala Agung Metropolitan, the company that owns MMC.

As written in PT Interbat's financial records obtained by Tempo, the money was used to finance the construction of hospital facilities. In return, MMC promised to sell as many drugs as possible from the pharmaceutical company for a year, from August 2013 to September 2014 [17]. That MMC Hospital was not the only hospital that received facilitation payments. Interbat cooperates with 150 other public and private hospitals in DKI Jakarta, Banten, West Java, East Java and South Sulawesi. Some of them used the funds to build a new hospital building, the cost of eating and drinking for doctors, buying operational vehicles, and for hospital anniversary activities. In the document obtained by Tempo, four hospitals belonging to the Hermina Group in Jakarta and Bekasi were the largest recipients, around 1.3 billion, in 2015. However, the Hermina Group was not willing to be interviewed by Tempo.

Furthermore, there is also the case of AJB Bumi Putra which took actions that were contrary to the investment program, which invested customer funds incorrectly, which ultimately until 2020 was unable to pay customer claims, where in 2007 & 2008 entered into investment fund management contracts through PT. Optima Kharya Capital Management (Optima) was conducted 7 (seven) times, however the selection of Optima was indicated based on the results of Bribes, where the total money managed by Optima reached 307 billion, in 2009 Optima could not return the investment funds of PT.[18] AJB Bumi Putra, and only returns 10 billion at maturity. Besides Optima, there are also 5 (five) Investment managers who also manage the funds of PT. AJB Bumi Putra also has problems. As a result of the improper investment, PT. AJB Bumi Putra experienced an increase in money reaching 22.7 trillion, even though the assets owned by PT. AJB Bumi Putra is only 12.1 Trillion. The policy holder as the customer becomes the aggrieved party because he cannot receive his rights in accordance with the insurance policy.

In contrast to PT. Asuransi Jiwasraya and PT. ASABRI, who was made a suspect, defendant and convict of a corruption case, even his corporation was also made a suspect in corruption, the suspects/defendants were sentenced by the Supreme Court to life

imprisonment, fined, and an obligation to pay compensation as much as the state financial loss of 16 trillion for PT. AIS and 22 trillion for ASABRI. Meanwhile PT. AIB Bumi Putra is only subject to articles of the Capital Market Law, so it cannot provide fair legal certainty to the subject of the criminal law. The case above shows that law enforcement related to private sector bribery in Indonesia has not been running effectively. The bribery case is just one example of the many alleged private bribery cases in Indonesia. If this is allowed to happen, bribery cases in the private sector will continue to occur which not only harms the community but also has an impact on the country's economic losses.

3.4 Comparison of regulatory laws regarding bribery in the private sector

UNCAC 2003 has changed the world's paradigm in viewing corruption, where corruption was initially dominated by the concept of public actors, and was carried out to harm state finances, after the signing of the UN anti-corruption convention, the private sector and pure private actors were finally seen as corruption as outlined in the concept of international law, namely the convention, thus the convention becomes the norm of international law, which departs from the moral norms currently in force.

As a comparison, the authors use comparisons to other countries that have changed their paradigm on corruption, and do not distinguish the concept of corruption in terms of the perpetrators, but as long as it interferes with or harms the public interest or society, then the legislative product is seen as corruption. The author in this paper chose the Netherlands, because the legal system in Indonesia is guided by the legal system and legal principles in force in the Netherlands, thus it can be assessed regarding the shortcomings and backwardness of Indonesian legal products in viewing corruption compared to the Dutch which are both based on civil law system in its criminal law policy. Furthermore, the author chooses England which uses the common law legal system, where the criminalization of an act does not need to wait for ratification, because the judge's decision can directly make international law the basis for the implementation of its national law.

3.4.1 Private sector bribery in the Netherlands

The Netherlands is one of the countries that has criminalized bribery in the private sector, and has included a policy of criminalizing bribery in the bribery sector in the Dutch Criminal Code. Regarding bribery in the private sector, the Netherlands criminalizes this action, because there are parties who have received a gift from another party so that the recipient acts outside the existing provisions without good intentions. In the Netherlands, private sector bribery is criminalized if the bribed person conceals his gift or promise from his employer in breach of the requirement to act in good faith [19].

Furthermore, there are basically differences in terminology used by the Dutch Criminal Code and UNCAC in formulating bribery offenses in the private sector. If UNCAC uses the terminology "Bribery in the private sector", the Netherlands uses the definition "Private commercial bribery". However, in the formulation of the regulation, it does not have a different arrangement with bribes in the private sector. No wonder, if GRECO (*Group d'Etats Contre la Corruption/ Group of States Against Corruption*), an organization that assesses the suitability of legal products and anti-corruption programs in European countries with anti-corruption conventions that have been made and agreed upon by the European Union, instead categorizes the offense as Bribery in the private sector.

Since 1967, the Dutch Criminal Code has not only criminalized Active Bribery against Public Officials as regulated in section 177 of the Dutch Criminal Code (hereinafter referred

to as DCC or the Dutch Criminal Code) – 178 DCC, and Passive Bribery against Public Officials as regulated in section 363 DCC – 364 DCC, but also criminalize Bribery in the Private Sector, both active and passive, as regulated in section 328 DCC paragraphs 1 and 2. In contrast to UNCAC which uses the definition of under advantage as one of the elements in the article, the Dutch Criminal Code actually outlines the forms of Advantage in detail. The Dutch Criminal Code uses the phrases of gift, promise, and certain actions (service), to replace the definition of advantage. Regarding the element of the gift itself, the gift does not have to be goods or money but also other things. This is as once decided by Hoge Raad (Dutch Supreme Court) in 1994 who considered in its decision which finally the decision became jurisprudence, that providing/giving sexual favors could be included as a gift category, the Hoge Raad Decision 31 May 1994, NJ 1994, 673).

The phrases that have been used as elements in the offense have been used and explained further in the jurisprudence made by Hoge Raad which states that certain gifts, promises, and actions can be material or immaterial. Furthermore, the Dutch Supreme Court also explained that although the Gift, Promise and service must have a certain value for the recipient, it can also be in the form of non-commercial goods that are only of value by the recipient as stated in the Hoge Raad 25 consideration. April 1916, NJ 1916, 551. In the regulation of bribery in the private sector in the Dutch Criminal Code, the absence of accountability or concealment of certain gifts, promises and actions is the core of the offense.

3.4.2 Private sector bribery in the UK

In contrast to previous countries that included bribery offenses in the Criminal Code of their respective countries, the UK as a common law country and does not codify each offense into a criminal code, has regulations regarding bribery in the United Kingdom Bribery Act 2010 (UK Bribery Act). In this provision, there is no specific distinction between public officers and private sector bribery. This provision separates general bribery offenses from criminal acts of bribery committed against foreign public officials (bribery of foreign public officials). Furthermore, the provisions and fulfillment of offenses in the UK Bribery Act are slightly different from other countries.

If other countries generally regulate bribery offenses in the formulation of general norms based on elements of Offences, England actually fulfills bribery offenses by example. This can be seen in the arrangements in each article that regulates bribery offenses. Although the UK does not make a distinction between public officers and private sector bribery, the formulation of bribery offenses in the UK Bribery Act can basically cover bribery offenses in general (both public and private sectors). These provisions divide into two categories, namely, active bribery (offences of bribing another person) as regulated in Article 1 of the UK Bribery Act, while passive bribes (offences relating to being bribed) as regulated in Article 2 of the UK Bribery Act.

For example, if the police find facts and evidence that A as the owner of Manchester United football club gave money in the amount of 900 million to B as a football player from Manchester City club who wanted A to act unsportsmanlike and was given a red card by the referee or to play 'not professionally' in order to be replaced by the Manchester City coach with another player, in a final match between Manchester United and Manchester City, then A agrees to B's request, A does what B is asked, then English law enforcement can ensnare A based on the case first on the basis of article 1 paragraph (2) of the UK Bribery Act, and B was charged under the third case through article 2 paragraph (2) of the UK Bribery Act. As for the

criminal arrangements related to legal subjects that can be sentenced under the UK Bribery Act, it can be imposed on individuals or legal entities. Arrangements related to the legal subject of individual bribery in the UK are regulated in article 11 of the UK Bribery Act, while for corporate actors it is regulated in article 14 of the UK Bribery Act [20].

The regulation in article 11 of the UK Bribery Act distinguishes 2 (two) mechanisms for resolving bribery cases with different penalties. In article 11 paragraph (1) letter a, it allows the perpetrators of bribery to serve their sentences without a trial process with the jury. In short, the provisions provide definitions through summary convictions. Summary Conviction is the decision of two to three magistrate judges and one district judge through Summary Proceeding in which the Summary Proceeding itself is a judicial process that handles minor criminal cases (Summary Offences). There is no Jury in the Summary Proceedings. The institution authorized to take care of the Summary Proceeding is called the Magistrates Courts.

Every criminal process in the UK must go through Magistrates Courts (courts of first instance) where the case will be judged as light or heavy. There are certain serious criminal cases that cannot be handled by Magistrates Courts, such as cases of murder, rape can only punish rape, or robbery (these cases are commonly known as Indictable Offences). Magistrates Courts can only punish a maximum of 12 months and a maximum fine of £5,000. If the Magistrates Courts consider the defendant to be sentenced to more than this limit, then the Magistrates Courts in their decision must state that this case should be handled by the Crown's Courts (higher courts).

In general, cases handled through this mechanism are mild cases. Not surprisingly, the UK Bribery Act limits that bribery cases decided based on summary convictions can only be sentenced to a maximum of 12 months in prison and fines cannot exceed the limit determined based on the summary proceedings. It should also be noted that in criminalizing corporations, the UK Bribery Act adheres to a strict liability system where the intention or positive action of the corporation is proven. Meanwhile, for cases that are decided based on a decision through an ordinary trial process, through indictment until the jury is guilty or not and the sentence is determined by the judge, it can be subject to 10 years imprisonment and an unlimited fine. However, it should be noted that the UK as a common law country in general also has sentencing guidelines that can be used as a guide for judges in the UK so as not to arbitrarily impose the severity of punishment on convicts, and also to avoid the occurrence of a high rate of disparity in punishment from each judge's decision.

4. Conclusions

Normatively, it can be seen that there is a lack of norms in Law No. 11 of 1980 regarding bribery and Law No. 31 of 1999 in conjunction with Law No. 20 of 2001 regarding the eradication of Corruption, and with these lacking legal norms, Of course, to create legal certainty for different norms, changes are needed from the current bribery legal norms to adapt to existing legal norms in Law No. 7 of 2006 concerning Ratification of the United Nations Convention Against Corruption, 2003 as a mandate for harmonization of regulations. National legislation in the prevention and eradication of criminal acts of corruption in accordance with this Convention (UNCAC 2003) that the laws and regulations in Indonesia have not regulated the criminal act of private bribery as regulated in Article 21 of UNCAC. The bribery arrangement in the Bribery Criminal Act can ensnare the private sector for bribery.

However, in the law there are obstacles, namely that corporations have not been regulated as legal subjects for *rechtsprson*.

In addition, another problem relates to the phrase "public interest" as a condition for an act to be considered an act of bribery under the Act. The next problem related to private bribery is the absence of rules regarding accounting and audit standardization, internal company regulations, maintenance of books and records, as well as disclosure of financial statements as regulated in Article 12 of UNCAC on the Private Sector. On the other hand, the lack of law enforcement through the instruments of Law no. 11 of 2018 is also something that needs to be considered. The Corruption Eradication Commission (KPK) as an independent state institution in dealing with corruption is not authorized to take action to eradicate, prevent and monitor bribery in the private sector because it is not included in the scope of corruption. According to the author, it is time for bribery in the private sector in accordance with UNCAC recommendations to be included in the law as an effort to eradicate corruption in a comprehensive manner.

Conflicts of Interest. The authors declare no conflict of interest.

References

1. Catatan Buruk Korupsi di Dunia. Available online: <https://tirto.id/catatan-buruk-korupsi-di-dunia-cBmq> (accessed on 26 February 2020).
2. Hiariej, E.O.S. United Nations Convention Against Corruption dalam Sistem Hukum Indonesia. *Mimbar Hukum*. 2019; 31(1), pp. 112-125. <https://doi.org/10.22146/jmh.43968>
3. Idonesiana, Suap Dokter = 40 Persen Harga Obat Tiga Hal yang Mengejutkan. Available online: <https://www.indonesiana.id/read/53241/suap-dokter-40-harga-obat-tiga-hal-yang-mengejutkan> (accessed on 15 october 2020).
4. Detik, 4 Kasus Pengaturan Skor di Tangan Satgas Anti Mafia Bola. Available online: <https://sport.detik.com/sepakbola/liga-indonesia/d-4387385/4-kasus-pengaturan-skor-di-tangan-satgas-anti-mafia-bola> (accessed on 12 September 2020)
5. Muhjadi, H.; Nuswardani, N. *Penelitian Hukum Indonesia Kontemporer*. Genta Publishing: Jogjakarta, Indonesia, 2012, p. 9.
6. Wibowo, M. *Kebijakan hukum terbuka dalam putusan mahkamah konstitusi konsep dan kajian dalam pembatasan kebebasan pembentuk undang-undang*, First Ed, First Printing. Rajawali pers: Depok, Indonesia, 2019, pp. 26-27.
7. Marzuki, P.M. *Penelitian Hukum*. Prenadamedia Group: Jakarta, Indonesia, 2011, p. 93.
8. Sumardjono, M.S.W. *Pedoman Pembuatan Usulan Penelitian Sebuah Panduan Dasar*, 3rd Ed.; Gramedia Pustaka Utama: Jakarta, Indonesia, 2001, p.10.
9. Priyono, B.H. *Korupsi, melacak arti, menyimak implikasi*. PT. Gramedia Pustaka Utama, Jakarta, Indonesia, 2018, pp.17-18.
10. Ruslan, M. *Politik Antikorupsi di Indonesia, Gradualitas Dan Ambiguitas*. Pustaka LP3ES, Jakarta, Indonesia, 2017, p.48.
11. Rose, C.; Kubiciel, M.; Landwehr, O. *The United Nations Convention Against Corruption: A Commentary*. Oxford University Press, Oxford, UK, 2019, p. 238.
12. Hair, P.J. *Urgensi Penanganan Tindak Pidana Korupsi di Sektor Swasta*. Pusat Penelitian Badan Keahlian DPR RI: Jakarta, Indonesia, 2018, p. 24.
13. Adji, O.S. *Herziening-Ganti Rugi, Suap, Perkembangan Delik*. Erlangga: Jakarta, Indonesia, 1981, p. 226.
14. Korupsi di Sektor Swasta Lebih "Gila". Available online: <https://nasional.kompas.com/read/2018/02/01/07304001/korupsi-di-sektor-swasta-lebih-gila?page=all> (accessed on 1 July 2021).
15. Standar Manajemen Anti Suap ISO 37001, Langkah Maju Indonesia Berantas Korupsi. Available online: <https://padmaglobal.co.id/2018/04/27/standar-manajemen-anti-suap-iso-37001-langkah-maju-indonesia-berantas-korupsi/> (accessed on 1 April 2021).

16. Perusahaan Swasta yang Terapkan Sistem Manajemen Antisuap Masih Minim. Available online: <https://katadata.co.id/hariwidowati/berita/5e9a558da6677/perusahaan-swasta-yang-terapkan-sistem-manajemen-antisuap-masih-minim> (accessed on 11 Augst 2021).
17. Hadad, T. Di Balik Investigasi Tempo 01. Tempo Inti Media: Jakarta, Indonesia, 2017, pp. 48-49.
18. Select Commite on the bribery act. Available online: <https://www.parliament.uk/globalassets/documents/lords-committees/Bribery-Act-2010/Bribery-written-evidence-volume.pdf> (accessed on 30 December 2021).
19. Complying with bribery laws in key European Jurisdiction. Available online: https://www.iadclaw.org/assets/1/7/_4-_Rosenhek.pdf (accessed on 30 December 2021).
20. United Kingdom magistraat court act 1980. Available online: <https://www.legislation.gov.uk/ukpga/1980/43/contents> (accessed on 29 December 2021).

Citation: Resmen; Madjid, A.; Sulistyo, F.; Dewantara, R. The urgency of criminalization of bribery in the private sector as a criminal action of corruption in the corruption law. *Journal of Social Sciences* 2022, 5 (3), pp. 188-202. [https://doi.org/10.52326/jss.utm.2022.5\(3\).15](https://doi.org/10.52326/jss.utm.2022.5(3).15).

Publisher's Note: JSS stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright:© 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Submission of manuscripts:

jes@meridian.utm.md