ЕКОНОМИКА

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1. Часопис "Економика" покренут је јула 1954. године и под називом " Нишки привредни гласник" излазио је до јуна 1957. године, а као "Привредни гласник" до краја 1969. године. Назив "Наука и пракса" носио је закључно са бројем 1/1973. год. када добија назив "Економика" који и данас има.

2. Часопис су покренули Друштво економиста Ниша и Друштво инжињера и техничара Ниша (остало као издавач до краја 1964. године). Удружење књиговођа постаје издавач почев од броја 6-7/1958. године. Економски факултет у Нишу на основу своје одлуке броја 04-2021 од 26.12.1991. године постао је суиздавач "Економике". Такође и Економски факултет у ПриШтини постао је суиздавач од 1992. године. Почев од 1992. године суиздавач "Економике" је и Друштво за маркетинг региона Ниш. Као суиздавач "Економике" фигурирали су у току 1990-1996. године и Фонд за научни рад општине Ниш, Завод за просторно и урбанистичко планирање Ниш и Корпорација Винер Брокер Ниш.

3. Републички секретаријат за информације СР Србије својим Решењем бр. 651-126/73-02 од 27. новембра 1974. године усвојио је захтев "Економике" за упис у Регистар новина. Скупштина Друштва економиста Ниша на седници од 24. априла 1990. године статутарном одлуком потврдила је да "Економика" има статус правног лица. На седници Скупштине Друштва економиста Ниш од 11. новембра 1999. године донета је одлука да "Економика" отвори посебан жиро-рачун.

4. Према Мишљењу Републичког секретаријата за културу СР Србије бр. 413-516/73-02 од 10. јула 1973. године и Министарства за науку и технологију Републике Србије бр. 541-03-363/94-02 од 30. јуна 1994. године "Економика" има статус научног и ранг националног часописа "Економика" је почев од 1995. добила статус међународног економског часописа.

5. УРЕДНИЦИ: др Јован Петровић (1954-1958), Миодраг Филиповић (1958-1962), Благоје Матић (1962-1964), др Драгољуб Стојиљковић (1964-1967), др Миодраг Николић (1967-1973), др Драгољуб Симоновић (1973-1984), др Миодраг Јовановић (1984-3-4/1988), др Драгољуб Симоновић (1990-2019), др Зоран Симоновић (2019-до данас).

1. The journal EKONOMIKA was initiated in July 1954. It was published as "Nis Economic Messenger" till June, 1957 and as "The Economic Messenger" till the end of 1969. The title "Science and Practice" it had till the issue 1/1973 when it changed its name into EKONOMIKA as it entitled today.

2. The Journal was initiated by the Society of Economists of Nis and the Society of Engineers and Technicians of Nis (the latter remaind as the publisher till the end of 1964). The Society of Accountants became its publisher starting from the issue no. 6-7/1958. The Faculty of Economics, Nis, on the basis of its Resolution No. 04-2021 from December 26, 1991, became the co-publisher of EKONOMIKA. Likewise, the Faculty of Economics of Pristina became the co-publisher since in 1992. Starting from 1992, the co-publisher of EKONOMIKA has been the Society for Marketing of the Region of Nis. Other co-publishers of EKONOMIKA included, in the period 1990-1996, the Foundation for Scientific Work of the Municipality of Nis, the Institute for Spatial and Urban Planning of Nis and the Corporation Winner Broker, Nis.

3. The Republic Secretariat for Information of the Socialist Republic of Serbia, by its Resolution No. 651-126/73-02 from November, 27, 1974, approved of EKONOMIKA's requirement to be introduced into the Press Register. The Assembly of the Society of Economists of Nis, at its session on April 24, 1990, by its statutory resolution, confrmed the legal status of EKONOMIKA. At the session of the Assembly of the Society of Economists, Nis, on November 11, 1999, the resolution was adopted the EKONOMIKA was to open its own bank account.

4. According to the Opinion of the Republic Secretariat for Culture of the Socialist Republic of Serbia No. 413-516/73-02 from July 10, 1973 and the Ministry for Science and Technology of the Republic of Serbia No. 541-03-363/94-02 from June 30, 1994, EKONOMIKA has the status of a scientific and national journal. Starting from 1995, EKONOMIKA has been having the status of international economic journal.

5. EDITORS: dr Jovan Petrovic (1954-1958). Miodrag Filipovic (1958-1962), Blagoje Matic (1962-1964), dr Dragoljub Stojiljkovic (1964-1967), dr Miodrag Nikolic (1967-1973), dr Dragoljub Simonovic (1973-1984), dr Miodrag Jovanovic (1984-3-4/1988), dr Dragoljub Simonovic (1990-2019), dr Zoran Simonovic (2019-till the present day).

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ПРЕГЛЕДНИ НАУЧНИ РАДОВИ / SCIENTIFIC REVIEW ARTICLE

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THE INFLUENCE OF FLEXIBLE WORK ARRANGEMENTS ON THE INNOVATIVE WORK BEHAVIOR OF EMPLOYEES IN THE IT SECTOR OF THE REPUBLIC OF SERBIA

Abstract

Flexible work arrangements (FWAs) are non-traditional work patterns that enable employees and employers to agree on when, where, and how tasks are performed, enhancing work-life balance. This study investigates the effect of flexible work arrangements on innovative work behavior (IWB) in Serbia's IT sector, focusing on idea generation, promotion, and realization. Using a sample of 185 IT employees, the research employs PLS-SEM analysis with IBM SPSS Statistics and SmartPLS software. The results reveal a significant positive relationship between flexible work arrangements and innovative work behavior, demonstrating that flexible work arrangements foster creativity and innovation. The findings emphasize the strategic value of flexible work arrangements in enhancing employee performance and organizational innovation. The study contributes to bridging a gap in the literature by providing empirical evidence on FWAs' role in fostering innovation within the IT sector in Serbia. Practical implications highlight the need for tailored flexible work arrangements to improve employee engagement and organizational competitiveness, with recommendations for future research involving larger and more diverse samples.

Key words: flexible work arrangements, innovative work behavior, IT sector, Republic of Serbia

JEL classification: J0, O30, M10, M54

УТИЦАЈ ФЛЕКСИБИЛНИХ РАДНИХ АРАНЖМАНА НА ИНОВАТИВНО ПОНАШАЊЕ ЗАПОСЛЕНИХ У ИТ СЕКТОРУ РЕПУБЛИКЕ СРБИЈЕ

Сажетак

Флексибилни радни аранжмани представљају нетрадиционалне радне обрасце који омогућавају запосленима и послодавцима да се договоре о времену,

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месту и начину обављања задатака, чиме се побољшава баланс између пословног и приватног живота. Ова студија истражује утицај флексибилних радних аранжмана на иновативно понашање запослених у ИТ сектору Србије, са фокусом на генерисање, промоцију и реализацију идеја. Коришћењем узорка од 185 запослених у ИТ сектору, истраживање примењује анализу PLS-SEM уз помоћ софтвера IBM SPSS Statistics и SmartPLS. Резултати показују значајну позитивну везу између флексибилних радних аранжмана и иновативног понашања запослених, указујући на то да флексибилни радни аранжмани подстичу креативност и иновације. Налази наглашавају стратешку вредност флексибилних радних аранжмана у унапређењу перформанси запослених и организационе иновативности. Студија доприноси попуњавању празнине у литератури пружајући емпиријске доказе о улози флексибилних радних аранжмана у подстицању иновација у ИТ сектору Србије. Практичне импликације истичу потребу за прилагођеним флексибилним радним аранжманима како би се побољшала ангажованост запослених и конкурентност организација, уз препоруке за будућа истраживања која би укључивала веће и разноврсније узорке.

Кључне речи: флексибилни радни аранжмани, иновативно радно понашање, ИТ сектор, Република Србија

Introduction

The challenges faced by organizations worldwide, such as the rapid development of information and communication technologies, digitalization, and globalization, directly impact the need for organizations to adapt their behavioral patterns not only to survive in the market but to become leaders in their business fields and creators of future development directions (Vasić, 2020; Gašić, 2021). As one of the strategies for attracting and retaining top talent, companies are compelled to adopt various approaches to ensure their success. The implementation of FWAs is one such strategy through which organizations can improve their business operations. The aim of this research is to determine the existence of a relationship between the observed variables, specifically whether there is a direct positive relationship between flexible work arrangements and employees' innovative behavior, whether employees are satisfied with this way of working, and to what extent the implementation of this model influences the increase in innovative work behavior among employees in Serbia's IT sector. The IT sector was included in the analysis due to the high level of FWA application in this field. Understanding human behavior is a crucial prerequisite for improving organizational functioning and aligning the needs and desires of organizations and employees. Organizational behavior integrates the humanistic aspects of management into a novel approach to understanding the role and significance of the human factor and its management within organizations. In this study, innovative work behavior is the dependent variable, while flexible work arrangements are the independent variable. Farr & Ford (1990) define innovative work behavior as the behavior of individuals aimed at initiating and deliberately introducing new and useful ideas, processes, methods, or procedures. Spreitzer

(1995) describes innovative behavior as a reflection of creating something new or different, while Scott & Bruce (1994) emphasize that it encompasses the production of usable processes or services arising from problem identification and idea generation (Al-Omari et al., 2019). Examining the impact of flexible work arrangements in modern business, particularly in the IT sector, where the application of this model is pronounced, represents a significant scientific endeavor. The objective is to investigate the influence on employees' innovative work behavior. Based on the findings, IT companies can evaluate the effects of implementing this business model and reorganize their processes to enhance employee performance and, consequently, overall organizational performance.

The research consists of three parts. The first part is dedicated to the theoretical foundations of the study. The second part includes a description of the questionnaire and the sample used for the analysis. As part of the data collection process, a survey was conducted among employees in Serbia's IT sector. The third part presents the results and a discussion of the findings obtained using the SmartPLS software. In this section, the authors conduct a PLS-SEM analysis to determine the relationship between the observed variables of FWAs and innovative work behavior. Additionally, the study graphically illustrates the level of teleworking application before, during, and after the COVID-19 pandemic. Finally, the authors present conclusions and recommendations for future research.

1. Literature review

1.1. Understanding flexible work arrangements

Due to various internal and external influences that relate directly to the nature of work, there are developed different work patterns that modified traditional way of organizing working hours such as weekend work, home-based work, teleworking, job share, shift work, flexi-time, part-time job, overtime, compressed working week, fixed-term contract, temporary work, etc. (Coenen & Kok, 2014; Berber & Slavić, 2019; Gašić & Berber, 2021). Those patterns are called flexible work arrangements. As a result of the intention of companies around the world to become more flexible, but also in response to various influences such as the Covid-19 pandemic, digitalization, globalization, etc., many organizations are moving from traditional work (working in offices) to different types of FWAs, mainly home and remote work. FWAs offer employees the ability to make changes to where, when, and the total amount of time they will spend or engage in work-related tasks and are typically used as part of an HR strategy to attract, motivate and retain key talent (Richman et al., 2008). Flexible work arrangements represent "a mutually beneficial arrangement between employees and employers in which both parties agree on when, where and how the employee will work to meet the firm's needs" (Kossek et al., 2014, p. 2). FWAs represent great significance in the creation of jobs in the twenty-first century. Organizations that practice the application of FWAs in their business become aware that changing work patterns towards flexibility can offer employees to make a better balance between work and private life (Cazes et al., 2015; Capnary, Rachmawati & Agung, 2018; Rusilowati, 2022) which also results in better productivity (Garg & Yajurvedi, 2016), positive working attitudes and positive behavior on the job (Dettmers, Kaiser & Fietze, 2013; Rahman, Kistyanto & Surjanti, 2020; Weideman & Hofmeyr, 2020; Gašić & Berber, 2021; Bontrager, Clinton & Tyner, 2021; Berber et al., 2022).

1.2. Understanding Innovative work behavior

Innovation allows companies to adapt to the changes that occur due to the development of digitalization, globalization, economic and other challenges to become more competitive and successful. Previous research confirmed that innovation is beneficial for company performance because companies can then respond more quickly to challenges and take better advantage of new market opportunities. It is necessary to influence employees to see the importance of innovations both for the company itself and for themselves. This knowledge is necessary if companies want to pursue innovative strategies and align employee behavior with strategies (Bos-Nehles et al., 2017). Understanding human behavior at work is necessary to improve functioning and reaching goals of an organization and their employees. Innovative work behavior is characterized as the intentional behavior of a person to introduce and apply new thoughts, items, procedures, and methods in his workplace, unit, or organization. The procedure refers to the creation of new applications for critical thinking (De Jong & Den Hartog, 2007). Innovative behavior is related to defining the problem, producing a solution and implementing a solution into the organization (Turgut & Beğenirbaş, 2013). Innovative work behavior is more important than just being creative, because "it also includes behaviors needed to implement ideas and achieve improvements that will enhance personal and/or business performance" (Yunus et al., 2014, p. 216).

Three dimensions of innovative work behavior are: idea generation, which involves the production of new and useful ideas in a specific domain, idea promotion that involves spreading ideas or developed innovations to other contexts, and realization, as creating a prototype or model of an innovation that others can experience (Messmann & Mulder, 2010). If we look at the effects of HRM on innovative work behavior, the authors Bysted and Jespersen (2014) found that the relationship between private and public organizations differs and that the effect of training and development practices on innovative work behavior is smaller in public than in private organizations, and this research is relating to the private IT sector organizations in the Republic of Serbia. Also, FWAs are very often in It companies, that are also very innovative, so it is important to investigate what are the relations between FWA and IWB. Önhon (2019) emphasizes that if managers understand how to positively influence innovation climate and work behavior that support innovation, they can create opportunities for innovation in their organizations, and improve performance.

1.3. Relations between flexible work arrangements and innovative work behavior

According to the results of theoretical review of authors of this paper, there are no so many previous research that investigated proposed relationship. Some that are found to be reliable based on key words, proposed relations, and results from analysis of papers in Web of Knowledge database, are presented below.

Rahman, Kistyanto & Surjanti (2020) studied FWAs during the COVID-19 pandemic, focusing on their impact on employee performance and the mediating role of IWB. The results showed that while FWAs did not significantly affect performance, they positively influenced IWB, which in turn mediated the relationship between FWAs and performance. Moll & de Leede (2016) examined how new ways of working, such as remote work, flexible hours, and flexible workplaces, impact IWB. Their research found that these practices positively affected all stages of IWB, with telecommuting enhancing opportunity exploration and idea

generation, and flexible hours increasing employee engagement and innovation. Azeem & Kotey (2021) highlighted that flextime and flexi-leave positively influence innovation by providing mental space and diversity for knowledge creation and sharing. They suggest that managers in SMEs should prioritize these FWAs to foster innovation. Qi, Liu, Li & Liu (2021) investigated the effects of FWAs on IWB in the IT sector in China. Their findings showed that a greater degree of flexibility in FWAs leads to higher levels of IWB, particularly when the flexibility offered aligns with employee needs. Based on the review of previous theoretical and empirical research, the authors propose the hypothesis:

H_1: Flexible work arrangements relates positively to the Innovative Work Behavior of employees in the IT sector of the Republic of Serbia.

2. Methodology

2.1. The questionnaire

The questionnaire has four sections. The first section consists of questions related to the socio-demographic (gender, age, education) and organizational characteristics (work position, size of organization, main market on which company operates, company headquarters, and type of the company (like a national, international, or subsidiary of the national or international company)). The second section refers to question related to flexible work arrangements. The authors used standardized questionnaire developed by Albion (2004). The example of the question from the used questionnaire is "FWAs help me balance life commitments", based on Likert scale (1-5). The third part refers to questions on innovative work behavior, where the authors used Janssen's questionnaire with 9 questions that make 3 constructs (idea generation, idea promotion, and realization). An example of question is: "I search out new working methods, techniques, or instruments", also on Likert scale (1-5). The fourth part of the questionnaire refers to the level of application of teleworking before, during, and after the Covid-19 pandemic. These three questions were taken from the Cranet questionnaire for 2022 (Cranet, 2023).

2.2. The sample

The data was collected from 185 employees in the IT sector in Serbia between June and October 2022 using Google Forms. According to the ten times rule (Hair et al., 2017), this sample size is suitable for PLS-SEM analysis. Of the respondents, 65.9% were men and 34.1% were women. The majority (51.9%) were aged 25-34, and 62.7% held a master's degree. Most respondents (71.4%) were professional workers, with 66.4% employed in SMEs. The majority (87%) worked for companies operating globally, while 2.7% served regional markets. Most respondents (55.7%) indicated that their company's headquarters were in Serbia, with 36.2% at national headquarters and 37.8% in subsidiaries of international companies.

Table 1: Sample characteristics

Sample characteristics		Number	Percent (%)
Gender	Male	122	65.9
	Female	63	34.1
Age	Less than 25	11	5.9
	25–34	96	51.9
	35–44	62	33.5
	45–55	16	8.6
Education	High School	11	5.9
	Three-year vocational studies	8	4.3
	Bachelor's degree	41	22.2
	Master's study	116	62.7
	Ph.D.	9	4.9
Possition	Manager	43	23.2
	Professional worker	132	71.4
	Administrative worker	10	5.4
Company size	Small	48	25.9
	Medium	75	40.5
	Large	62	33.5
Main market	Regional	5	2.7
	National	6	3.2
	International	13	7
	Global	161	87
Headquarters of company	Republic of Serbia	103	55.7
	EU	47	25.4
	A non-EU country	13	7
	Other	22	11.9
Type of company	National company	67	36.2
	A subsidiary of a national company	2	1.1
	An international company	46	24.9
	A subsidiary of an international company	70	37.8
Total		**185**	**100**

Source: Authors of research

2.3. Data processing

To test the proposed model, the authors used structural equation modeling with partial least squares. The PLS path model has two sets of linear equations, the first refers to the external model (measurement model) that specifies the relationship between the construct and its observed indicators, while the second refers to the internal (structural model) that specifies the relationships between the constructs (Gašić & Berber, 2023), in this research it is precisely the influence of flexible work arrangements on the innovative work behavior of employees in the IT sector in the Republic of Serbia. PLS-SEM has recently gained wide application in various fields, also in HRM. The first part of the analysis refers to the determination of reflective indicator loadings, if it is shown that the values of certain observed questions are outside the defined limits, it is necessary to exclude those questions from further analysis. The next step is related to the evaluation of the formative construct by outer weight,

standard deviation, t-statistics, p-value, and multicollinearity (variance inflation factor, VIF). If all criteria are met, the next step refers to the analysis of the reflective part of the model. Within the analysis of the reflective model, the authors will perform: internal consistency reliability and convergent validity, discriminant validity (Cross-loadings, Fornell-Lacker Criterion, and Heterotrait-monotrait HTMT), and multicollinearity statistic (VIF) (Grubor, Đokić, Milićević & Đokić, 2021, p. 277; Becker et al., 2023). The last part is about testing the structural model, the authors will use the bootstrapping procedure based on 5000 subsamples to test proposed hypothesis.

3. Results and discussion about obtained research

The first part of the data processing was dedicated to investigation of the measurement model. Reflective indicator loadings, internal consistency reliability, convergent validity, and discriminant validity were assessed. This type of measurement was proposed for reflective structures in the model of Hair et al. (2019) & Gašić & Berber (2021). Regarding the reflective indicators loadings, the lowest factor loading should not be below 0.708. Additionally, factor loadings between 0.4 and 0.7 could be retained in the model only if they would not affect AVE and composite reliability (Hair et al., 2014). Based on the results of the analysis, items FWA2R, FWA4R, FWA8R, and FWA11 were eliminated from the analysis since their loading level below threshold. Figure 1 shows retained objects with the permitted degree of load.

Figure 1: Path analysis
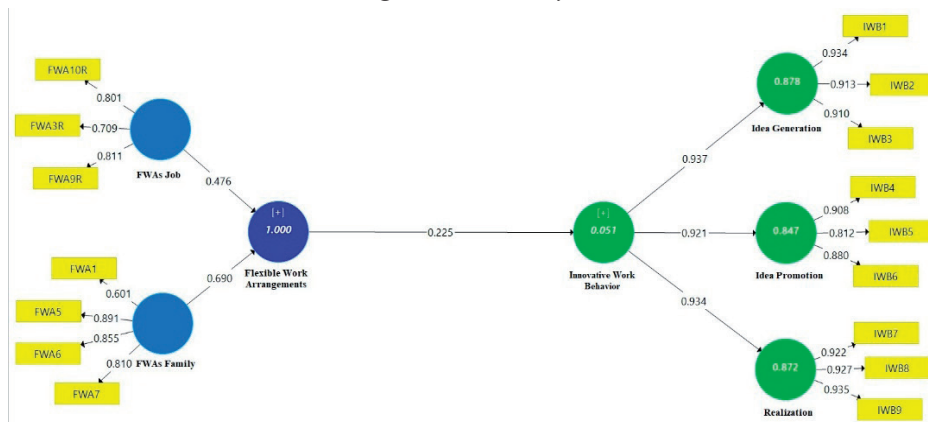
Source: Authors of research

The authors tested the appropriateness of the formative construct related to flexible work arrangements. Based on Table 2, formative construct is appropriate for further analysis (FWA Family; B=0.476; T=22.325; p<0.00) and (FWA Job; B=0.690; T=16.138; p<0.00).

Table 2: Analysis of the formative construct

Direct effect	Outer Weights	Standard dev.	T Stat.	*p - values*
FWAs Family -> Flexible Work Arrangements	0.476	0.031	22.325	0
FWAs Job -> Flexible Work Arrangements	0.69	0.029	16.138	0

Source: Authors of research

Table 3: Variance inflation factor – VIF

Direct effect	Variance inflation factor - VIF	
	Values	Criterion
Flexible Work Arrangements - Family	1.259	< 3.3 (Kock, 2015)
Flexible Work Arrangements - Job	1.259	

Source: Authors of research

The multicollinearity analysis was assessed by the variance inflation factor (VIF). Based on the data in Table 3, there is no multicollinearity in formative construct (values are below 3.3). The next step refers the test of reflective construct in the model. Table 4 represent the reliability test, analysis of Cronbach's Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) coefficients.

Table 4: Indicator and construct reliability and validity

Name	Cronbach's Alpha		CR		AVE	
	Values	Criteria	Values	Criteria	Values	Criteria
FWAs - Family	0.8	> 0.6 (Dakduk, González & Portalanza, 2019; Bjekić et al., 2020)	0.87	> 0.7 (Hair et al., 2014; Sabi et al., 2016)	0.64	> 0.5 (Dash & Paul, 2021)
FWAs - Job	0.66		0.82		0.6	
Idea Generation	0.91		0.94		0.84	
Idea Promotion	0.84		0.9		0.75	
Realization	0.92		0.95		0.86	

Source: Authors of research

Based on the data obtained, the value of Cronbach's Alpha ranged from 0.66 (FWAs - Job) to 0.92 for Realization. The Cronbach's Alpha criteria is satisfied. The value of CR of constructs ranged from 0.82 (FWAs – Job) to 0.95 (Realization). Based on the criteria in table 4, we conclude Composite reliability is satisfied. Convergent validity was assessed by testing AVE, ranging from 0.6 (FWAs – Job) to 0.86 (Realization). Criteria for convergent validity was also satisfied. Discriminant validity of the model was assessed by Cross-loadings indicators, the Fornell-Lacker Criterion, and Heterotrait-monotrait HTMT (Ab Hamid, Sami & Sidek, 2017; Gašić et al., 2024).

Table 5: Discriminant validity (Cross-loadings)

Variable name		Items	FWAs		IWB		
			FWAs Family	FWs Job	Idea Generation	Idea Promotion	Realization
FWAs	FWAs Family	FWA1	**0.601**	0.305	-0.033	0.06	0.034
		FWA5	**0.891**	0.31	0.074	0.114	0.155
		FWA6	**0.855**	0.293	0.069	0.154	0.126
		FWA7	**0.81**	0.518	0.128	0.26	0.233
	FWAs Job	FWA10R	0.34	**0.801**	0.099	0.173	0.244
		FWA3R	0.367	**0.709**	0.195	0.226	0.191
		FWA9R	0.348	**0.811**	0.067	0.229	0.121
IWB	Idea Generation	IWB1	0.13	0.153	**0.934**	0.782	0.751
		IWB2	0.018	0.193	**0.913**	0.713	0.725
		IWB3	0.081	0.077	**0.91**	0.713	0.755
	Idea Promotion	IWB4	0.128	0.24	0.798	**0.908**	0.739
		IWB5	0.171	0.256	0.579	**0.812**	0.508
		IWB6	0.208	0.214	0.691	**0.88**	0.77
	Realization	IWB7	0.124	0.202	0.79	0.733	**0.922**
		IWB8	0.219	0.207	0.718	0.765	**0.927**
		IWB9	0.165	0.256	0.746	0.69	**0.935**

Source: Authors of research

A measurement model has adequate discriminant validity if indicator loadings are higher for its structural construct than for any other construct (Chin, 1998). The results shown in Table 6 indicate that the cross-loadings output confirms the discriminant validity of the measurement model.

Table 6: Discriminant validity (Fornell-Lacker criterion)

Variable name		FWAs		IWB		
		FWA Family	FWAs Job	Idea generation	Idea promotion	Realization
FWAs	FWAs Family	**0.8**				
	FWAs Job	0.45	**0.78**			
IWB	Idea generation	0.08	0.15	**0.92**		
	Idea promotion	0.19	0.27	0.8	**0.87**	
	Realization	0.18	0.24	0.81	0.79	**0.93**

Source: Authors of research

Table 6 shows that the discriminant validity is satisfied because the value of the root of Average variance extracted on the diagonal is higher than all values below for each variable respectively (Fornell & Larcker, 1981). Table 7 presents the result of the analysis of discriminant validity through Heterotrait-Monotrait (HTMT).

Table 7: Discriminant Validity – Heterotrait-Monotrait (HTMT)

Variable name		FWAs		IWB		
		FWAs Family	FWAs Job	Idea generation	Idea promotion	Realization
FWAs	FWAs Family					
	FWAs Job	0.62				
IWB	Idea generation	0.12	0.2			
	Idea promotion	0.23	0.37	0.89		
	Realization	0.2	0.31	0.86	0.84	

Source: Authors of research

HTMT ratio values below 0.9 indicate that the defined components are sufficiently different from each other; it means that they describe different phenomena (Hair et al., 2019; Strugar Jelača et al., 2022). The results presented in Table showed that the discriminant validity criterion is met.

Table 8: Multicollinearity statistics

Variable name		Items	Variance inflation factor - VIF	
			Values	Criterion
Flexible work arrangements	FWAs - Job	FWA10R	1.431	VIF < 3.3 (Kock, 2015) VIF < 5 (Wong, 2013)
		FWA3R	1.172	
		FWA9R	1.448	
	FWAs - Family	FWA1	1.213	
		FWA5	3.531	
		FWA6	3.141	
		FWA7	1.628	
Innovative work behavior	Idea generation	IWB1	4.791	
		IWB2	2.932	
		IWB3	2.783	
	Idea promotion	IWB4	4.134	
		IWB5	1.717	
		IWB6	2.082	
	Realization	IWB7	3.105	
		IWB8	3.334	
		IWB9	4.197	

Source: Authors of research

The threshold value of VIF factors is 3.3 (Kock, 2015). The questions FWA5, IWB1, IWB4, IWB8 & IWB9 record values of VIF above 3.3, in the work of the author (Wong, 2013) the value of VIF below 5 is also accepted. According to the data presented in Table 10, the multicollinearity analysis shows that the criterion is met. The last step after the tested measurement model (internal model) refers to the testing of the structural (external model). Structural model analysis was performed using bootstrap analysis with 5000 subsamples. Using this analysis, the value is determined: Original Sample (β), Sample Mean, St. Deviation, t-statistics, and *p*-value, the results of which, i.e. the tested influence between the observed variables, will be presented tabular and graphically below (Gašić & Berber, 2023).

Table 9: Results of bootstrapping

Direct effect	β	St. Deviation	t -statistics	p-value
Flexible Work Arrangements -> Innovative Work Behavior	0.225	0.085	2.648	0.008

Source: Authors of research

The results shown in Table 9 indicate a positive statistically significant relation between flexible work arrangements and innovative work behavior, where values of β=0.225; t=2.648; p=0.008. Based on the conducted analysis, hypothesis H_1 is confirmed. More precisely, if employees perceive positively to flexible work arrangements, it will affect the increase in their innovative work behavior. The structural model presented in Figure 2:

Figure 2: The path model with the bootstrapping result

Source: Authors of research

Due to the limited number of studies worldwide on the impact of flexible work arrangements on employees' innovative work behavior in the IT sector, this research represents a significant scientific contribution. It was found that employees who use various types of FWAs, such as remote work, flexi time, and home-based work exhibit a positive effect on their innovative work behavior. Some previous studies that have also reported such positive effects include those by Rahman, Kistjanto & Suryanti (2020), Mol & de Lide (2016), Azim & Kotey (2021), Gašić (2023), and Gašić et al. (2025). In his doctoral dissertation, Gašić (2023) confirmed the positive impact of FWAs on innovative work behavior based on a sample of 582 respondents in Serbia, suggesting that these effects are not exclusive to the IT sector but are also present in other industries and business sectors.

The results obtained from employees in the IT sector provide a valuable finding for contemporary HR theory and practice. Innovative work behavior which includes the generation, promotion, and implementation of new ideas in the workplace is crucial for organizational sustainability and competitiveness, especially in today's dynamic and unpredictable market conditions. These positive effects can be attributed to the fact that flexible work provides employees with greater autonomy, the ability to achieve a better work-life balance, and more

effective time management. In addition, FWAs foster psychological conditions that enhance proactivity and creativity. As a result, organizational commitment and intrinsic motivation are strengthened both of which are key prerequisites for innovative behavior.

Flexibility can also reduce stress and fatigue, thereby freeing up mental capacity necessary for divergent thinking, experimentation, and curiosity. Employees who work in environments that value flexible work practices are more likely to engage in behaviors that go beyond their formal job responsibilities and contribute to the improvement of processes and outcomes. In the next part, the authors presented the level of application of teleworking before, during, and after the Covid-19 pandemic in the IT sector in the Republic of Serbia (Gašić, 2021).

Next part refers to present of level of application of teleworking in three periods, before, during and after Covid-19 pandemic in IT sector in the Republic of Serbia. This part is very significant because we need to see how organization can enhance their job, what is better for them and did they still use maintained the same level of implementation and why.

Figure 3: Level of application of teleworking before, during, and after the Covid-19 pandemic in the IT sector in the Republic of Serbia

■ Teleworking before Covid-19 pandemic ■ Teleworking during Covid-19 pandemic ☐ Teleworking after Covid-19 pandemic
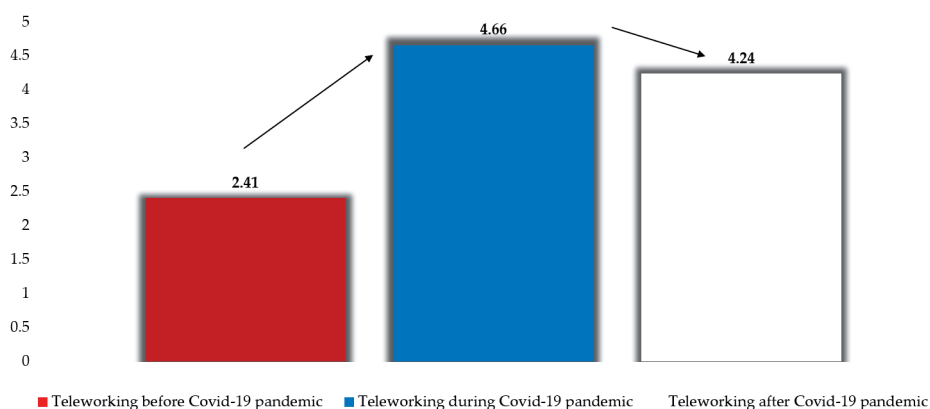
Source: Authors of research

Based on the results represent in Figure 3 we conclude that the level of application of teleworking before the Covid-19 pandemic was 2.41, this level is the lowest in comparison to the other two. Due to the emergence of the Covid-19 pandemic, there is a sudden increase in the application of this type of flexible work arrangement (Berber & Gašić, 2023), and after the Covid-19 pandemic, there is a slight drop in the level of application to 4.24, which is still a high level compared to the level of application before the COVID-19 pandemic, which indicates that IT companies in the Republic of Serbia saw the advantages of this way of doing business and directed their business in line with it.

Conclusion

The authors conducted a theoretical review of the literature on flexible work arrangements (FWAs), innovative work behavior (IWB), and their relationship. Previous studies indicate that FWAs positively affect IWB (De Spiegelaere, Van Gyes & Van Hootegem, 2016; Rahman, Kistyanto & Surjanti, 2020; Azeem & Kotey, 2021). Based on this, they hypothesized H_1: "FWAs are positively related to IWB in the IT sector of the Republic of Serbia." The authors then conducted an empirical study with 185 IT employees from Serbia. After coding the data, they performed PLS-SEM analysis using SmartPLS 3. The analysis confirmed the validity of the formative construct and the measurement model, including indicator and construct reliability, validity, and discriminant validity. The collinearity statistic analysis met the criteria, followed by an analysis of the structural model and bootstrapping results. The findings showed a positive and statistically significant relationship between FWAs and IWB, confirming H_1. Employees who positively perceive FWAs tend to exhibit higher IWB. These results align with previous studies, such as Qi et al. (2021), who found that greater flexibility in FWAs leads to higher IWB, and De Spiegelaere et al. (2016), who highlighted the importance of work autonomy in promoting IWB. The authors also analyzed the application of teleworking before, during, and after the COVID-19 pandemic in the IT sector of Serbia. The results showed the highest application during the pandemic, with a slight decrease afterward, but still a high level compared to the pre-pandemic period. This suggests that companies recognized the benefits of teleworking and continued its use at a higher level.

Future research should involve a larger sample from the IT sector to enhance the quality of the study. Given the lack of scientific works on this topic, further research could provide a better understanding of how FWAs impact both employee behavior and organizational attitudes.

The IT sector plays a crucial role in adapting businesses to external and internal challenges, such as new generations (Y & Z), globalization, digitalization, and crises (COVID-19, political, and economic instability). Developing IWB among IT employees is vital for improving efficiency, productivity, and organizational leadership. The practical implication is that flexible work can enhance employee innovation. Managers should identify and implement appropriate FWAs to foster innovative behavior.

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COSTS OF PLANT OILS ENCAPSULATION USING EXTRUSION SND PROCESS[6]

Abstract

Plant oils are important not only for human nutrition, but also for cosmetic industry, pharmaceutical industry and alike. Within plant oils, there is an increasing interest for production and use of grape seed oil as a type of high-quality plant oil. Nevertheless, grape seed oil should be treated (through the process of encapsulation) in order to protect its active ingredients. Therefore, the goal of this research is to analyse the costs of a new and original approach to grape seed oil encapsulation, which is called submerged-nozzle dispersion (SND) for oil encapsulation in alginate. After determining necessary investments in equipment, total production costs were calculated (as well as average costs per unit of product). Authors also discussed fixed and variable costs per kilogram of encapsulates for different levels of capacity use. Risk analysis was performed by applying sensitivity analysis and assuming different scenarios for market prices of the most important inputs. It was determined that average production costs of encapsulates significantly vary depending on production level, while prices of grape seed oil and sodium alginate also play an important role. Costs also depend on some technological factors, such as encapsulation efficiency and load of active compound. The results offer an insight in the effects of future investments in food industry.

Key words: *grape seed oil, encapsulation, extrusion, costs, input prices, sensitivity analysis*

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ТРОШКОВИ ИНКАПСУЛАЦИЈЕ БИЉНИХ УЉА УПОТРЕБОМ ЕКСТРУЗИОНОГ СНД ПРОЦЕСА

Сажетак

Биљна уља су важна не само за људску исхрану, већ и за козметичку индустрију, фармацеутску индустрију и слично. У оквиру биљних уља, постоји растући интерес за производњу и употребу уља из семена грожђа као врсте висококвалитетног биљног уља. Ипак, уља из семена грожђа морају се третирати (процесом инкапсулације) да би се заштитили њихови активни састојци. Зато је циљ овог истраживања анализа трошкова новог и оригиналног приступа инкапсулацији уља семенки грожђа, који се назива дисперзија помоћу потопљене млазнице (СНД) за инкапсулацију уља у алгинату. Након утврђивања неопходних улагања у опрему, израчунати су укупни трошкови производње (као и просечни трошкови по јединици производа). Аутори су такође разматрали фиксне и варијабилне трошкове по килограму инкапсулата за различите нивое употребе капацитета. Анализа ризика је извршена применом сензитивне анализе и под претпоставком различитих сценарија за тржишне цене најважнијих инпута. Утврђено је да просечни трошкови производње инкапсулата значајно варирају зависно од његовог обима производње, док цене уља из семенки грожђа и натријум алгината такође имају важну улогу. Трошкови такође зависе од одређених технолошких фактора, као што су ефикасност инкапсулације и садржај активног једињења. Резултати пружају увид у ефекте будућих инвестиција у прехрамбену индустрију.

Кључне речи: *уље семенки грожђа, инкапсулација, екструзија, трошкови, цене инпута, сензитивна анализа*

Introduction

Plant oils are one of the most important groups of food products widely used as sources of active compounds necessary for human metabolism such as polyunsaturated fatty acids, polyphenols, tocopherols, monoterpenes, etc. Besides food applications, plant oils are also important for cosmetic and pharmaceutical industry. Analysing economic aspects of investment in "essential oils production" from medical plants Nastić et al. (2024) concluded that such investments are economically justified. Nevertheless, this research is primarily devoted to grape seed oil, and its use. Duba and Fiori (2019) discussed economic effects of extracting grape seed oil, concluding that the observed process "can produce high-quality seeds oil at a cost-effective price". Dabetic et al. (2020) discussed and compared quality of grape seed oils from white grape varieties (two out of six varieties were autochthonous Serbian). Authors concluded that oil quality scores indicated similar results for the observed varieties, "although Smederevka stands

out as the most potent one". Importance of grape seed oil production and discussion of its quality parameters was performed by other authors, as well (Pardo et al., 2009; Abd El-Hack et al., 2024; Martin et al., 2020; Gitea et al., 2023).

It should be taken into account that many oils' compounds are unstable and can undergo chemical transformations that change their metabolic properties and reduce their nutritional value. Hence, the protection of oil's active compounds is a challenge for many industrial processes and food practices. One of the strategies that can be used for oil protection is encapsulation (Rodríguez et al., 2016). Modern consumers require food products that, besides energy and basic nutrients, provide additional healthy components. One of the approaches in the delivery of healthy compounds is to protect them using encapsulation and apply encapsulates in food products formulations. For example, Stajić et al. (2018) used encapsulated flaxseed oil to improve nutritional value of the fermented sausages. Also, encapsulation could be used for masking unpleasant sensorial properties of active compounds in food products (Choudhury et al., 2021). However, some encapsulation processes require complex formulations of carrier material to achieve good protection of active compounds (Strobel et al., 2020). Apart from food processing industry, encapsulation could be used in various fields of agriculture an aquaculture, such as delivery of bio stimulants in agriculture (Jíménez-Arias et al., 2022) or delivery of bioactive agents in aquaculture (Masoomi Dezfooli et al., 2019). Also, the encapsulated nutrients could be included into animal feed, which may positively influence productivity and animal health (Ariaeenejad et al., 2024; Fontana et al., 2025).

Encapsulation is a process of protection of an active ingredient by forming a protective layer of carrier material that serves as a barrier against external factors such as oxygen, light, moisture or high temperatures (that may change grape seed oil chemical properties). Encapsulation methods such as spray drying, freeze drying, coacervation and extrusion are commonly used for protection of plant oil (Rodríguez et al., 2016; da Silva et al., 2022). Extrusion (which will be discussed in this research) is the encapsulation method that utilizes polysaccharides, proteins or their mixtures as carrier materials for entrapment of active compound. Depending on extrusion method, encapsulates in various shape and size could be obtained. Usually, spherical shape is preferable, while encapsulate size could be in the range from ~50μm to above 2 mm (Đorđević et al., 2015). Encapsulation of oils and generally hydrophobic compounds (e.g. liquid aromas) using an extrusion method, is described in details by Lević et al. (2015). Recently, Lević et al. (2024) presented a new extrusion method i.e., submerged-nozzle dispersion (SND) for oil encapsulation in alginate. By using SND method, it is possible to achieve high oil load and encapsulation efficiency.

Economic sustainability of encapsulation process depends on many factors. Generally, the costs of encapsulation primarily include the cost related to necessary equipment as well as costs of materials, labor and energy. In some cases, the costs of encapsulation could become very high, limiting the usage of encapsulated active compound (Strobel et al., 2020). However, if the encapsulation is the only way to stabilise or deliver active compound, then the encapsulation and its costs must be taken into consideration. This is particularly obvious in the case of expensive active compounds. Namely, according to Popplewell (2001) the expensive active compounds are more suitable for encapsulation because the costs of encapsulation have less influence on the overall price of final product i.e. encapsulate. Also, the costs of encapsulation

process depend on capacity use (production volume) while revenues are related to selling price of products, as well (Dimitrellou et al., 2019). Observing the development of encapsulation technology, Timilsena et al. (2020) mentioned that an "innovative food-grade encapsulants are being explored to reduce the production costs" while at the same time they should meet "consumer expectations".

Serbian market is dominated by imported encapsulated food products such as food additives and supplements. Development of domestic encapsulation capacities can increase competiveness of our food sector, especially when food sector is oriented towards more healthy food products. It requires entrepreneurial initiative, which is (according to Janošik et al., 2024) related not only to personal characteristic of an entrepreneur but also to a number of other factors (economic, technological and socio-cultural). Nikitović et al. (2023) explained the impact of training on employees' performance in an entrepreneurial environment in Serbia. Authors stated that "without a systematic investment in increasing the knowledge and skills of employees, organizations may find themselves in a position of losing a competitive edge". When it comes to potential level of foreign direct investments in Central and Eastern Europe (according to Zarić, S., 2022), it is closely linked to "cheap resources and increased efficiency", meaning that "the availability of skilled labour and low labour costs have emerged as significant determinant".

Having that in mind, the goal of this research is to discuss the costs of the new approach to encapsulation technology (extrusion SND process), as well as factors influencing the costs. The main research question is how to determine the level of costs related to innovative encapsulation technology in the expected Serbian business environment, and to examine behaviour of encapsulation costs in risky circumstances.

Material and methods

Grape seed oil encapsulation in alginate using SND process is a new technology which is described in details by Lević et al. (2024). This study is focused on the production of wet encapsulates that could be used in the variety of food products, such as food additives and supplements.

The prices of equipment and necessary materials were obtained on the international and domestic market during the period June-July 2024. All the prices are expressed in EUR using exchange rates established by the National Bank of Serbia. It was estimated that one appropriately trained (full time) employee can successfully operate the equipment. The costs of the depreciation were obtained by applying straight-line method, based on the useful life of fixed assets (which is expected to be 8 years). An average yearly cost of interest is calculated on the basis of 8% interest rate. It was assumed that the purchase of all the equipment is financed by external funds (bank loan).

Apart from determining cash outlays necessary for equipment purchase, authors calculated total costs of SND encapsulation process. Besides that, fixed, variable and total costs (per unit) for various levels of production capacity use were determined. Cost behaviour in risky circumstances was discussed by applying sensitivity analysis for different levels of market prices for the most important elements of material costs. Various scenarios (the most probable, optimistic and pessimistic) were also discussed.

Results and Discussion

The research was based on the idea of using equipment which is not expensive to provide effective way for protection of active compounds from grape seed oils. Annual production capacity of equipment discussed in this research (Table 1) is 6.750 kg of wet encapsulates per year.

Table 1. Equipment for the production of wet encapsulates

Equipment	Amount (EUR)
Air compressor	4,000.00
Encapsulation unit/custom made	1,000.00
Homogenizer	7,000.00
Supporting equipment	2,000.00
Total	**14,000.00**

Source: Authors` research

By using such equipment for SND encapsulation process, material costs presented in Table 2 were obtained. They are dominated by the costs of sodium alginate (as the most expensive type of material) and grape seed oil (as the material which is encapsulated).

Table 2. Material costs for the SND encapsulation

Material	Unit	Cost per unit (EUR)	Material for the production of 1 kg of wet encapsulates	Amount of produced wet encapsulates (kg, annually)	Total cost of material (EUR)
Sodium alginate	Kg	400	0.015	6,750	40,500.00
Calcium chloride	Kg	10	0.09	6,750	6,075.00
Cold pressed grape seed oil	L	30	0.20	6,750	40,500.00
Distilled water	L	0.133	15.00	6,750	13,466.25
Total					**100,541.25**

Source: Authors` research

Beside materials costs, there are other costs such as energy cost (electricity costs), labor costs, depreciation, interest and costs of equipment maintenance. Variable costs are estimated on the base of using overall production capacity for SND encapsulation process. Analysis showed that material costs are the most important element of total costs, while labor costs are also significantly contributing to the overall cost of SND encapsulation process (Table 3). As can be seen, the other costs individually contribute with less than 3% in total costs (total participation of costs other than material and labor costs is 4.98%). This is in line with findings presented by Nastić et al. (2024) who determined that processing costs of medical plants (essential oils production) are

dominated by material costs, while labor costs are usually second important type of costs (depending on the production year). Considering all costs necessary for annual production (6,750 kg of wet grape seed oil encapsulates), it is determined that the production cost per one kilogram of encapsulates is 18.20 EUR (average production costs per kilogram).

Table 3. Total costs of SND encapsulation process

Item	Costs (EUR)	Contribution (%)
Materials costs	100,541.25	81.83
Energy costs	3,600.00	2.93
Labor costs	16,200.00	13.19
Depreciation	1,750.00	1.42
Interest	630.00	0.51
Maintenance costs	140.00	0.11
Total costs	**122,861.25**	**100.00**

Source: Authors` research

At the same time, it should be taken into account that average production costs depend not only on the capacity use, but also on the potential variation of input market prices. Sodium alginate and grape seed oil are considered as the most influential inputs in this analysis. Assuming 100% use of production capacities, authors considered variation of input market prices within the range from -30% to +30%. In such a way production costs were calculated for different combinations of sodium alginate and grape seed oil prices (Table 4). It could be noticed that production costs per one kilogram of wet encapsulates vary from minimal 14.60 EUR/kg (presenting the most optimistic scenario for input market prices) to 21.80 EUR/kg (reflecting the most pessimistic combination of input market prices).

Table 4. Production cost of encapsulates (EUR/kg) at 100% capacity use

Change of input price	Sodium alginate						
Grape seed oil	-30%	-20%	-10%	0%	+10%	+20%	+30%
-30%	14.60	15.20	15.80	**16.40**	17.00	17.60	18.20
-20%	15.20	15.80	16.40	**17.00**	17.60	18.20	18.80
-10%	15.80	16.40	17.00	**17.60**	18.20	18.80	19.40
0%	**16.40**	**17.00**	**17.60**	**18.20**	**18.80**	**19.40**	**20.00**
+10%	17.00	17.60	18.20	**18.80**	19.40	20.00	20.60
+20%	17.60	18.20	18.80	**19.40**	20.00	20.60	21.20
+30%	18.20	18.80	19.40	**20.00**	20.60	21.20	21.80

Source: Authors` research

Nevertheless, the table above describes the only situation in which production capacity is fully used, which is very demanding in terms of organization in practice. To make an analysis more detailed, i.e. to predict more possible outcomes, authors analysed various scenarios for certain levels of production volume (Table 5).

Table 5. Production cost of encapsulates (EUR/kg) for different levels of capacity use

	Scenario		
Capacity use	**Optimistic**	**Most probable**	**Pessimistic**
10%	39.56	43.16	46.76
50%	17.38	20.98	24.58
90%	14.91	18.51	22.11
100%	14.60	18.20	21.80

Source: Authors` research

The analysed scenarios are the optimistic, the most probable and the pessimistic one (which is a usual approach according to Ivanović and Marković, 2018). The most probable scenario uses input prices which were common at the time when the analysis was performed. On the other hand, the optimistic scenario reflects the best option (the lowest prices of sodium alginate and grape seed oil), while the pessimistic scenario represents the highest prices of the observed inputs.

The results of this research showed a lower price of oil encapsulates compared to Strobel et al. (2020) (in most cases). According to the same authors, the cost of encapsulation of fish oil in alginate using extrusion external gelation process was estimated at 37.98$. Further, they tried to calculate the costs of encapsulates if the gelling process is modified by decreasing the mass ratio between emulsion and gelling solution. The lowest price of encapsulates of 24.32$ was achieved when this ratio was equal (which is closer to the price of wet oil encapsulates that is obtained in this study). SND process can operate successfully when emulsion and gelling solution ratio is 1:2 or 1:3. This is significantly lower compared to other extrusion processes that usually use at least up to five times more gelling solution than SND encapsulation process. Also, according to the same research, the decreasing in the required amount of gelling solution leads to decreasing of investment in gelling vessels and other equipment. This can explain the lower prices of SND encapsulates that we calculated in this study.

It should be pointed out that the prices of encapsulates presented by Strobel et al. (2020) also include the costs of encapsulates drying, which contributed to the higher prices of final encapsulates. On the other hand, we discussed the production of wet encapsulates as more convenient for application if food products with higher water content. Considering the SND process, it provides high encapsulation efficiency with high load of active compound (Lević et al., 2024). As efficiency and load of active compound increase, encapsulate production is more economically sustainable (Popplewell, 2001). According to Xu et al. (2024), challenges and limitations of encapsulation technology are not only "pollution and energy consumption" related to it but also "high preparation costs" and issues concerning the encapsulation rate.

Conclusion

Encapsulation of plant oils (grapes seed oil in this case) protects their active ingredients against external factors that may change oil chemical properties. Therefore, production of encapsulates offers good opportunity to increase competitiveness in food production and other sectors related to healthy products. Having in mind that encapsulated food products are in majority of cases imported in Serbia, it is necessary to develop domestic production of encapsulated plant oils. The information about encapsulation costs is useful for the calculation of prices of food products that contain encapsulates. Besides, this study provided economic analysis that could help the investors to calculate their own prices of encapsulated active compounds.

The research enabled an insight into the relation between production costs of encapsulates and some important factors (such as the capacity use of installed equipment and the prices of key materials). Encapsulation efficiency with high load of active compound proved to be the most important technological factor. The results of this study have practical implication on managerial decisions regarding future investments in food processing industry. Future research in this field in Serbian conditions should be primarily directed towards the economic efficiency of encapsulates drying in order to decrease the level of water content. Therefore, future research steps require determination of investments in additional equipment necessary for the drying of wet encapsulates (e.g. lyophilization process) and discussion of associated costs. There is also a possibility of paying to other specialized companies to dry encapsulates (instead of investing in specialized equipment) which should be explored in future research, as well. In such a way, an extent to which the lyophilization increases the costs of encapsulates production and economic efficiency of this process could be determined.

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FINANCING OF THE SME SECTOR IN SERBIA - OPPORTUNITIES AND LIMITATIONS

Abstract

Small and medium-sized enterprise (SME) sector has become a highly significant segment of the modern economy in both developed and developing countries. This sector is a major creator of new jobs, innovations and technological advancements, earning its place in the development strategies of individual countries and regional associations, including the EU. In its economic policy, the Republic of Serbia assigns considerable importance to this sector to enhance the competitiveness of its economy and to access developed international markets. However, due to their small size, enterprises in this sector face significant challenges, primarily limited opportunities for financing their growth and development. This paper addresses the financing possibilities for the SME sector, exploring options such as commercial bank loans, capital market financing and access to investment loans and credits. The research presents findings based on a sample of 127 small and medium-sized enterprises, focusing on the opportunities and challenges these businesses encounter in securing funding for their operations.

Keywords: *small and medium enterprises, economic growth and development, enterprise financing, competitiveness.*

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ФИНАНСИРАЊЕ СЕКТОРА МСП У СРБИЈИ - МОГУЋНОСТИ И ОГРАНИЧЕЊА

Апстракт

Сектор малих и средњих предузећа је постао веома значајан сегмент савремене привреде у високо развијеним земљама као и земљама у развоју. Овај сектор је креатор великог броја нових радних места, иновација и

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технолошког напретка па је у добио своје место и у стратегијама развоја појединачних земаља као и регионалних асоцијација, од ЕУ па даље. Република Србија у својој економској политици даје значајно место овом сектору у циљу подизања конкурентности своје привреде и изласку на развијена међународна тржишта. Ипак, због своје мале величине предузећа из овог сектора имају велике тешкоће у свом пословању, а оне се првенствено огледају у ограниченим могућностима финансирања раста и развоја ових предузећа. У том смислу, овај рад се бави питањима могућности финансирања сектора малих и средњих предузећа како путем комерцијалних банкарских кредита, тако и њиховим финансирањем са тржишта капитала или добијањем инвестиционих зајмова и кредита. У раду су приказани резултати истраживања на узорку од 127 предузећа из реда малих и средњих предузећа која се тичу могућности и проблема са којима се овај сектор сусреће у финансирању свог пословања.

Кључне речи: мала и средња предузећа, привредни раст и развој, финансирање предузећа, конкурентност

Introduction

For a long time, small and medium-sized enterprise (SME) sector was regarded in economic literature as inferior to large enterprises regarding its contribution to economic growth, productivity and technological advancement. However, the dynamic development of this sector in recent decades has been driven by various social and economic factors, primarily the failure of the corporatist concept, alongside a growing understanding of the problems related to economies of scale and other disadvantages of large enterprises. Practice has shown that the effects of economies of scale are not always as economic theory suggests, that the size of enterprises can have its downsides and that large enterprises are not necessarily more innovative, efficient or socially responsible than SMEs.

Serbia's economic development during the transition period was based on a neoliberal development model and inefficient privatization, which led to negative changes in the economic structure. While certain years witnessed relatively high GDP growth rates, these were primarily driven by service industries closely tied to high import levels, whereas the development of the real economy lagged behind. This pattern of development has resulted in low international competitiveness, high national debt, a negative trade balance, unequal regional development, high unemployment, unfavorable migration trends marked by the emigration of young people and a low standard of living for the population.

In such an economic environment, the performance of small and medium-sized enterprises (SMEs) often hovers on the edge of profitability. This sector typically lacks sufficient internal resources to finance its development, while the conditions for obtaining external funding are highly unfavorable. In Serbia, commercial bank loans dominate as the primary source of external financing, yet the credit terms often fail to meet the needs of SMEs in terms of loan maturity, interest rates, collateral requirements,

currency clauses and similar factors. Government financing is minimal and the country lacks a domestic development bank to support larger investment projects undertaken by enterprises.

The aim of this paper is to explore the financing options available to SMEs in both domestic and international financial markets, to analyze the conditions under which such funding can be secured and to identify the barriers these enterprises face in financing their operations, with the ultimate goal of enhancing their long-term competitiveness in the market.

Global Perspective on Entrepreneurship and SMEs Development

Over the past three decades, entrepreneurial culture has evolved into a global phenomenon, signifying a shift in how economies and societies view and integrate entrepreneurship. This transformation has not been straightforward; the development of entrepreneurship did not always enjoy unanimous support from policymakers, economic leaders or the professional community. The dominant economic governance model of the 1960s, referred to as corporatism, emphasized the necessity of direct and active state involvement in managing economic activities. This model underlined the importance of economies of scale for enhancing national competitiveness and promoted collaboration between "big business" and trade unions in addressing critical economic and social challenges (Paunović, 2021).

Within the corporatist framework, there was little room for the small and medium-sized enterprises (SMEs) sector. SMEs were perceived as technologically inferior to large corporations and, therefore, less significant for economic growth and national wealth creation. Entrepreneurial ventures were often considered remnants of an outdated economy, characterized by obsolete technology, inefficiency and archaic work processes (Marchesnay, 2011).

Development of entrepreneurial culture and entrepreneurial intentions (Ognjenović, 2024) in recent decades has been influenced by various social and economic factors, most notably the failure of the corporatism concept and an increased understanding of the limitations of economies of scale and the drawbacks of large enterprises (Scase, 2000). Practice has shown that the effects of economies of scale may not always align with economic theory. The size of an enterprise can also bring disadvantages and large companies are not necessarily more innovative or socially responsible than smaller businesses.

Additionally, experience has demonstrated that growth rates of large enterprises do not necessarily surpass those of small and medium-sized enterprises (SMEs). Moreover, large enterprises are not the primary creators of new jobs within an economy. Frequent strikes and tensions between employers and trade unions further highlighted the shortcomings of the corporatism model.

On the other hand, the growing awareness of the significance of the SME sector has significantly contributed to the development of entrepreneurial culture. SMEs play a critical role in addressing unemployment, fostering economic growth, diversifying economic structures and solving other economic and social challenges. Their capacity to

adapt quickly, innovate, and provide solutions to local and global needs underscores their importance in modern economies.

In transition economies, the development of small and medium-sized enterprises (SMEs) emerged as a result of privatization processes. These processes allowed state-owned assets to be acquired by private owners, facilitating their reallocation from inefficient state enterprises to a dynamic private sector. This transition has been supported by governments in many countries, which have adopted numerous national SME development strategies over the past decades. Among the most significant documents in this regard on the European continent are the European Charter for Small Enterprises and the Small Business Act.

Various factors driving entrepreneurship can be broadly divided into two main groups (Stoner, Freeman, 1989). The first group includes economic factors, ranging from market incentives to the availability of capital, such as the development of capital markets and their supporting institutions. The second group comprises a wide array of non-economic factors, including cultural values that promote entrepreneurship, general legal and societal frameworks for economic activity, and systemic economic measures and policies aimed at supporting the establishment and growth of new businesses. These factors collectively create an environment that fosters entrepreneurial activity (Matić, et.al. 2023), emphasizing the significance of both financial infrastructure and the broader social and cultural context in supporting SMEs.

Small and medium-sized enterprises (SMEs) play a crucial role in fostering economic progress in a country and society by creating numerous jobs for the community and increasing income in the areas where they operate. This is particularly reliant on the ability to make sound business decisions (Kovjanić, Vukadinović, 2020). The global economic crisis also posed a significant threat to the national economies of many countries, given that SMEs have been the driving force of their economies and the largest absorber of labor over the last decade. For SMEs to achieve a strong competitive edge and sustain growth as science and technology evolve, they must transition to scientifically grounded business strategies.

Diversity of SME sectors is vast and as a result, there is no universally accepted definition. Instead, each country establishes its own criteria for defining and classifying SMEs (Margaretha, Supartika, 2016). While there is no globally unified definition, the most commonly used criteria for identifying SMEs include the number of employees, total sales and total assets (Osei et al., 1993; Teal, 2002; Terziovski, 2010; Abor & Quartey, 2010). This variety in definitions reflects the unique economic structures and development priorities of different regions, underscoring the need for tailored approaches to SME policy and support.

Economic globalization and the internationalization of SMEs represent two key trends in global economic development. The contribution of SMEs to industrialization can be viewed within the context of dynamic environment shaped by globalization (Mutalemwa, 2015). At the beginning of the new millennium, SMEs were heralded as engines of economic growth, incubators of innovation and solutions to unemployment challenges. They are critical for socio-economic development due to their role in creating new jobs, boosting gross domestic product, fostering innovation and promoting entrepreneurship (Karadag, 2017).

Globally oriented SMEs adopt specific tools and methodologies to enhance quality (Zhussipova et al., 2021). Increasingly, attention is directed toward market demands

and customer satisfaction, prioritizing product quality while reducing costs and lead times. Maljugić et al. (2021) emphasize that implementing quality systems in SMEs should not be perceived as a cost but rather as an investment in improvements that yield better results. Often, SMEs require certain transformations, prompted by unresolved longstanding issues, emerging market challenges, or evolving trends in the external environment. Such transformations may encompass changes in company strategies, organizational structure, or business processes. These shifts typically lead to new approaches in business management, employee relations, attitudes and the innovative potential of the company (Litvaj et al., 2023).

Miletić and Ćurčić (2021) emphasize that various factors influence the productivity of different businesses, such as the acquisition of modern technological solutions and equipment, the standardization of business quality, continuous employee skill improvement and investing in the development of domestic brands. With the help of quality standards, businesses can secure additional support. These standards help predict potential mistakes or wrong moves and provide significant benefits in understanding customer desires and identifying market demands. As a result, organizations can focus on making secure and profitable decisions (Tadić et al., 2022). These factors highlight the need for SMEs to adapt continuously to global trends and leverage opportunities for innovation and efficiency to maintain their competitive edge in an interconnected economy.

SMEs are widely spread across the European Union and their numbers are continually increasing. However, "the number of newly established SMEs significantly exceeds the actual growth of the SME population due to the high mortality rate of SMEs, especially among young businesses" (European Commission, 2018). According to Knight (2000), SMEs operate in a hostile, risky and uncertain business environment. Entrepreneurial competencies are an overarching concept that refers to the expertise, skills and attitudes required to create, coordinate, and manage business ventures, as well as the risks involved (Novojen, Birnaz, 2019). Such competencies help entrepreneurs build profitable and sustainable businesses by combining them to gain a competitive advantage (Vu, Nwachukwu, 2021). Entrepreneurial expertise identifies business opportunities, formulates entrepreneurial visions, develops business models, creates business strategies and launches firms (Amini et al., 2021). These insights underscore the importance of developing a robust skill set and knowledge base for entrepreneurs in order to navigate the challenges and complexities of the modern business landscape. By focusing on quality standards, technological advancement, and strategic planning, SMEs can achieve growth and sustainability in competitive environments.

In modern economy, SMEs face significant challenges and threats to their survival in a competitive environment. Disruptive changes, such as those caused by the COVID-19 pandemic, force businesses to develop resilience to unstable conditions if they are to remain competitive. Innovation is a critical driver of business competitiveness and it must be integrated into the organizational structures, procedures, products and services of the company. Moreover, it has been found that innovation mediates the relationship between customer orientation and performance, as well as the connection between interfunctional orientations and performance. Consequently, innovative capability mediates the relationship between access to resources and the sustainability of SMEs, as well as strengthening the links between access to information and the sustainability of SMEs.

The contribution of small and medium-sized enterprises (SMEs) to the economic development of most developing countries is substantial. Providing employment for nearly two-thirds of the working-age population, contributing to state revenues through income/profit taxes and providing earnings in the form of profits, dividends and wages to households are just some of the key indicators that represent the hallmark of SMEs in developing countries (Amoako, 2013). During the COVID-19 pandemic, the main causes of financial difficulties for SMEs were delayed resumption of operations, declining market demand and restrictions in logistics and the movement of people.

This illustrates that SMEs not only contribute to economic stability and growth but also face unique challenges, particularly in times of global crises. The pandemic underscored the vulnerability of SMEs but also highlighted their potential to adapt and innovate in order to maintain their role in the economy. Ensuring their resilience through innovation and strategic adaptation is crucial for their long-term sustainability.

Many factors have been recognized as decisive for the business success of SMEs, most of which relate to internal rather than external conditions of the company (Feindt et al., 2021). Resources that SMEs possess (both tangible and intangible) play a crucial role in creating and managing competitive advantage and achieving superior performance. Unlike large companies, SMEs with limited financial resources and insufficient managerial infrastructure tend to rely less on expensive investments in research and development for innovation activities (Jones, Craven, 2000; Lim, Klobas, 2000; Nootboom, 1993). Therefore, in order to introduce innovations and gain a competitive advantage in the market, SMEs must leverage their internal factors, such as human capital.

In sum, while SMEs face resource constraints, their potential to drive economic growth and contribute to national prosperity cannot be overstated. Their role in job creation and wealth generation, especially in developing economies, positions them as crucial players in fostering economic resilience and innovation.

In developing countries, both public and private sectors recognize the importance of small and medium-sized enterprises (SMEs) for their contribution to economic growth, employment and social collaboration. At the same time, SMEs often face significant challenges. Compared to larger companies, SMEs are less likely to benefit from economies of scale and fewer of them have access to a broad base of resources. Due to the typically low capital levels of SMEs, they are relatively more vulnerable to external events compared to larger firms. This further implies that not only larger enterprises face different risks, but also small and medium-sized businesses, whose survival is more easily threatened due to their smaller pool of both financial and non-financial resources.

Like large organizations, small and medium-sized enterprises also face complex sustainability issues, which arise as a result of factors such as globalization, company size, technological advances, increased market competition, management changes, and limitations in capital financing.

Risk management can assist SME managers in identifying significant risks that could threaten the success or existence of the company in time to address them effectively. A wrong assessment or failure to recognize risks can, in the worst case, have catastrophic consequences, ranging from the loss of customers to environmental harm and possibly even bankruptcy (Hollman & Mohammad-Zadeh, 1984). However, many SMEs do not implement - or do not do so adequately - risk management practices, mainly because they cannot afford to dedicate resources to this due to their limitations.

It seems that SMEs are more focused on internal and short-term planning, while giving less attention to long-term planning. Main challenge for more effective performance management practices lies in the appropriate, balanced use of strategic and operational practices and relevant measures. Therefore, managerial activities such as developing vision, mission, and values, internal and external communication, change management and horizon scanning are recommended areas for improvement (Espinosa-Méndez & Inostroza Correa, 2022).

Small and medium-sized enterprises (SMEs) are undoubtedly important for maintaining strong economic growth; however, a major challenge lies in how to sustain their performance in the long term. Sustainable and consistently high performance reflects healthy performance management practices. For SMEs, adopting advanced management practices in key business processes is crucial for successfully improving their operations and competitiveness (Cagliano et al., 2001). However, it is well-known from the literature that SMEs face difficulties in adopting new and innovative management practices (Cagliano et al., 2001). Therefore, there is a clear need to stimulate the development of management capabilities in SMEs.

Changes in the global business environment have led to the transformation of SMEs towards sustainability, with a focus on cost efficiency. Despite the vast array of information available to SMEs, managers make decisions related to competitiveness based on their own synthesis of available information (asymptomatic information) and their understanding and judgment of the situation (bounded rationality). High-quality information is one of the competitive advantages for SMEs (Xu, 2010).

Sources and Issues of Financing the SME Sector in Serbia

Securing financial resources is one of the biggest challenges faced by SMEs. Most SMEs do not have access to all financing sources and the funds they secure from available financing sources are often obtained under less favorable conditions than those applied to larger enterprises. This is primarily due to the higher financing risk associated with these businesses compared to the risks faced by financiers of larger companies. In this sense, SME sector often finds itself in a kind of vicious circle of financing — under-capitalization is one of the most common causes of their high failure rates. High failure rates of small businesses increase the financing risk, which is why financial organizations approach lending and investing in these companies with caution (Paunović, 2021).

The process of globalization forces businesses from all sectors, regardless of their size or developmental stage, to adopt business practices imposed by leading multinational companies. In the international business environment, financial management is significantly more complex due to the influence of the following factors (Besley, Brigham, 2015): different currency denominations, differences in economic and legal environments, language and cultural differences, government roles, and political risks. Business decisions are harder to adapt or change when the rules, regulations, and business cultures differ significantly from one business environment to another.

Opportunities for securing financial resources for SMEs are in sharp contrast to the needs these businesses have for such resources. Without financial capital, even the best business ideas cannot be realized, nor can potentially the most dynamic enterprises

achieve growth and development. Mismatch between businesses with good business prospects and their inability to finance them due to a lack of financial resources is called the financial gap. There are two types of financial gaps: the soft financial gap, which occurs when companies impose their own restrictions on spending financial resources and the hard financial gap, which results from a mismatch in the supply and demand for financial resources.

Financial management is a business function that involves acquiring financial resources and allocating them to uses that most effectively achieve company's goals. Additionally, the function of financial management creates and distributes information about the company's financial activities. The goal of financial management is to maximize the profitability of business investments while maintaining an adequate level of current liquidity. Essentially, financial management should provide answers to the following three questions (Solomon, 1963): a) What should total investments in the company be? b) What should the structure of investments be? c) How should investments in the company be financed, i.e., what should the financial structure of the company be?

The limited capacity of SMEs to generate cash flow from operations, difficulties in securing credit to maintain liquidity, a less favorable position in the procurement market and shorter payment terms to suppliers are some of the reasons why cash flow management is of greater importance for SMEs than for larger enterprises. For the vast majority of small firms, capital markets and financial markets are inaccessible, imperfect or unorganized. The usual relationship between risk and return, established in perfect capital markets (where higher returns compensate for accepting higher risks, and vice versa), does not necessarily apply in small firms.

Standard indicators of liquidity, financial structure, and profitability can be unreliable indicators of the financial situation of small firms due to the lower reliability of accounting data on which these indicators are calculated. The lower reliability of accounting data in small firms is a consequence of the reduced level of social control over their operations compared to larger companies, particularly those whose shares are listed on the stock exchange (Pety, 1994). The actual value of small firms often depends on elements of intangible assets and human capital, whose value cannot be adequately expressed in the company's balance sheets. Additionally, many SMEs are not required to audit their financial statements, which further contributes to the lower reliability of their data.

Financial resources of a company can be either own or borrowed. Own funds are resources that the company permanently uses and is not obliged to repay to investors. Through invested funds, investors acquire ownership rights, the most significant of which are the right to manage and the right to participate in the profits earned by the company. Borrowed funds are resources that the company must repay to lenders within a certain period, including interest. These funds are obtained through debt financing, i.e., financing from credit sources. The obligation to pay interest is a particularly significant issue for SMEs, as creditors perceive them as risky borrowers. As a result, the cost of credit for SMEs includes a risk premium, leading to higher interest rates compared to larger companies.

Depending on whether they originate from sources formed within the company or external sources, a company's financial resources are divided into internal and external sources of financing. Internal sources of financing for a company can include: profit, asset

sales, reduction of working capital, extension of deferred payment terms and shortening of receivables collection periods (Hisrich, Peters, 1998). The second general group of financial resources for a company consists of external sources, including funds from founders, family and friends, commercial banks, private investors, government funds and others.

Of all credit resources, the most significant for financing SMEs are loans from commercial banks. In order for commercial banks to approve a loan to the SME sector, it is necessary for companies to provide a guarantee that they will repay the loan under the agreed terms. These guarantees can be in the form of business assets (land, business buildings, equipment, inventory, receivables, etc.) or personal assets of the owner. In addition, guarantees can be financial, where another financial organization (such as a bank, guarantee fund, etc.) guarantees the lender the repayment of the loan if the company itself is unable to repay it.

Commercial banks approve a wide variety of loans to businesses, which differ in terms of repayment period, purpose, collateral, approval conditions and other factors. Banks are primarily short-term capital lenders to businesses, although they also play a significant role in meeting medium-term and long-term financing needs of companies. Medium-term or long-term loans are granted by banks for periods longer than one year, intended for financing fixed assets such as equipment, real estate and other investments. These loans are repaid in multiple installments, either monthly or quarterly. They may also include a grace period or repayment moratorium, especially if the loan amount is large (Paunović, Zipovski, 2022).

Issuing bonds is one of the possible ways for SMEs to secure financing. Similar to issuing shares through an initial public offering (IPO), issuing bonds for SMEs is not feasible for many businesses due to high issuance costs, complex procedures and the market reputation that the issuer must have. Bonds can be placed privately, directly to financial organizations such as banks, insurance companies, etc., or they can be sold to the broader public through specialized intermediaries. There are various types of bonds, including secured and unsecured, with fixed or variable interest rates.

To address the issue of financing due to the lack of collateral that SMEs can offer, guarantee funds have been established. Guarantee funds are organizations that, by providing guarantees to creditors (banks and other financial organizations) that the loans will be repaid, facilitate SMEs' access to credit sources and enable financing under more favorable conditions. For a guarantee fund to function successfully, a number of prerequisites must be met. Most important external success factors for a guarantee fund include the existence of good projects, significant experience of lenders in evaluating credit applications, the demand for loans and other factors.

Financial market is the most important element of the financial system for financing the economy and businesses. Financial system in Serbia is highly bank-centric, as banks play the leading role in the growth of the Serbian financial system. Due to the shallowness of the capital market, companies primarily use bank loans as their main external source of financing. The bond market and other debt securities markets are virtually nonexistent. It is crucial for the financial market to be liquid in order to positively influence the potential for external financing of companies that plan to operate as publicly traded corporations. The strategic goal of the financial market in Serbia is to enable its capacity to finance the corporate sector, which is the main driver of economic growth.

The stock exchange is the organizer of the capital market, i.e., a place where securities of companies are traded. It is a place where companies need to secure additional financing, which is its most important function. The Belgrade Stock Exchange is still in transition, as it mainly trades shares from privatization processes and has not yet reached a level where domestic companies can raise capital, providing alternative sources of financing. Capital owners in Serbia who do not wish to save in banks invest in securities outside the country, which puts their savings directly into the growth and development of foreign companies and foreign capital markets. Without a developed capital market, it is impossible to achieve above-average economic growth rates or GDP growth. Domestic stock exchange is completely marginalized and lacks support from domestic economic policy makers.

For the long-term and sustainable development of the small and medium-sized enterprises (SMEs) sector, investment loans are necessary, provided under favorable conditions in terms of repayment terms, interest rates and lower associated costs such as collateral requirements, property mortgages, fixed fees for loan approval, unfavorable currency clauses, etc.

Investment loans for the SME sector make up a very small portion of the total loans provided by commercial banks. Although these loans are granted for long-term periods, they contain numerous unfavorable conditions for these enterprises. These loans are primarily indexed in euros, with interest rates being variable and tied to the movement of three-month, six-month or twelve-month Euribor, plus the bank's margin. As a result, the interest rates that our enterprises pay are much higher than those paid by businesses in neighboring countries, particularly those in EU member states, and thus, their business performance is burdened by high financial expenses and unfavorable cash flows.

In order to obtain investment loans, enterprises must meet numerous requirements, such as having a certain period of operation in their core business, achieving positive financial results over the previous years, and having the business owner be below a certain age, among others. Enterprises face various types of costs related to loan approval, including property insurance and the assignment of the insurance policy to the bank's benefit, property valuation fees, costs of obtaining credit bureau reports, one-time loan approval fees that can reach up to 1% of the approved amount and various other administrative costs.

Furthermore, grace period for loan repayment is not adapted to the specific needs and characteristics of the enterprise's activity. All of this indicates that, in the current conditions, small and medium-sized enterprise (SME) sector in Serbia cannot realistically rely on significant amounts of investment loans, which are necessary for the growth and development of their business, expansion of operations, introduction of new products and technologies and entry into international markets.

In the Republic of Serbia, financing and support for the SME sector primarily takes place through the banking sector, as well as through government institutions such as the Ministry of Economy, Development Fund and other administrative institutions at the provincial and local levels, such as regional development agencies, science and technology parks, business incubators, startup and smart city centers and others.

Ministry of Economy launched the Entrepreneurship Portal in 2018, in collaboration with the economy and international partners. The portal provides up-to-date information on various programs, including financial support for investment in SMEs,

business improvement, export support, business startup assistance, new employment, as well as non-financial support in the form of free advisory services. For example, in 2024, the Ministry of Economy is implementing 10 support programs for SMEs and entrepreneurship, through which it will allocate 2 billion dinars in non-refundable grants to domestic businesses and carry out projects worth over 4 billion dinars (https://www. privreda.gov.rs).

Among the Ministry's programs is the Equipment Procurement Program, in collaboration with banks and leasing companies, which provides 50% in non-refundable grants, 5% from the enterprise's own contribution and 45% as a loan from the bank/ leasing company. Other significant programs include the Development Opportunity Program— a line for the manufacturing industry in collaboration with Post Savings Bank, a line for the development of women and single-parent entrepreneurship, support for business startups and support for businesses in Kosovo and Metohija, among others.

Development Fund, among other things, provides investment loans for micro, small, medium, and large legal entities, for financing the procurement of equipment, machinery, plants, or the construction or purchase of production or business premises. These loans have an interest rate of 1,5% annually if secured by a business bank guarantee, and 2,5% annually otherwise. The repayment period is up to 10 years, with a grace period of up to 1 year, and repayment is either monthly or quarterly. In addition to these loans, the Fund also approves loans for startups and youth, loans for women's entrepreneurship and loans for hunting, fishing, production of wine, beer and strong alcoholic beverages (https://fondzarazvoj.co.rs).

Methodology

For the purposes of this paper, a primary survey was created to examine certain financial aspects of the operations of small and medium-sized enterprises (SMEs), related to the availability of financing sources from the capital market, the possibilities of obtaining investment loans for the SME sector, as well as bank loans for their growth and development and enhancement of competitiveness, both on domestic and international markets. In line with the above, the following hypotheses were formulated:

H1. The SME sector lacks access to financing sources from the capital market.
H2. Investment loans are insufficient for the growth and development of SMEs.
H3. Bank loans are unfavorable for the growth and development of SMEs.

The data was collected using a survey method using Google Forms. The research sample is a non-random sample, a purposive sample of employees in small and medium-sized enterprises on the territory of the Republic of Serbia. The pilot survey included 25 respondents. After the analysis of the pilot research (which involved checking the content validity of all aspects measured in this research), the final version of the survey was compiled and the research was conducted on a new group of 127 respondents (n=127). Time of data collection from March 2024 to June 2024.

Open-ended questions where respondents were supposed to write their attitude/ opinion, expectations will be handled qualitatively. Closed-ended questions in the questionnaire from the point of view of measurement are scale, ordinal and nominal. Attitudes and opinions were rated by the interviewees on a scale from 1 to 5, where 1

is I don't agree at all, and 5 is I totally agree. In order to obtain answers to the research questions, measures of central tendency, measures of dispersion, measures of symmetry and correlation analysis were calculated. Nonparametric techniques were used for hypothesis testing.

Research results

The research results are based on the survey "Financing Conditions for SMEs in the Economy of the Republic of Serbia." The survey involved 127 SMEs from four regions in the Republic of Serbia, with the following distribution: 39.37% of companies had up to 50 employees, 47.24% had up to 250 employees, and 13.39% had over 250 employees.
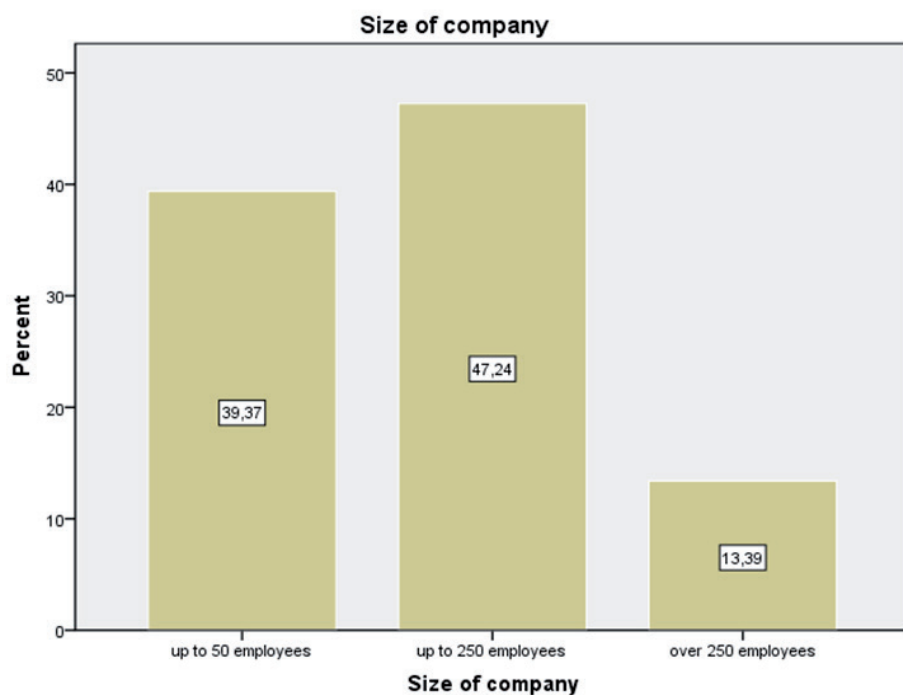

Graph 1. Structure of companies by size
Source: Authors' calculation

The conditions for obtaining bank loans favorable for business growth and development were rated by companies with a low average score of 2.30. The median score is 2, indicating that 50% of businesses rated the conditions as 2 or 1. The mode, or most frequent score, is also 2, highlighting this as the typical rating. The coefficient of variation is 33.91%, which indicates moderate variability in the responses. Additionally, the data shows a slight positive skewness (Skewness = 0.235), suggesting that a small proportion of businesses rated the conditions slightly higher than the majority.

The Kruskal-Wallis Test revealed a statistically significant difference in the perceived favorability and conditions for obtaining bank loans based on the size of the companies (Gp1, n = 50: Up to 50 employees; Gp2, n = 60: Up to 250 employees; Gp3, n = 17: Over 250 employees), χ^2(2, n = 127) = 11.433, p = 0.003. The results indicate that companies with Over 250 employees rated the conditions for obtaining bank loans as most favorable for business growth and development, as reflected by their highest mean rank.
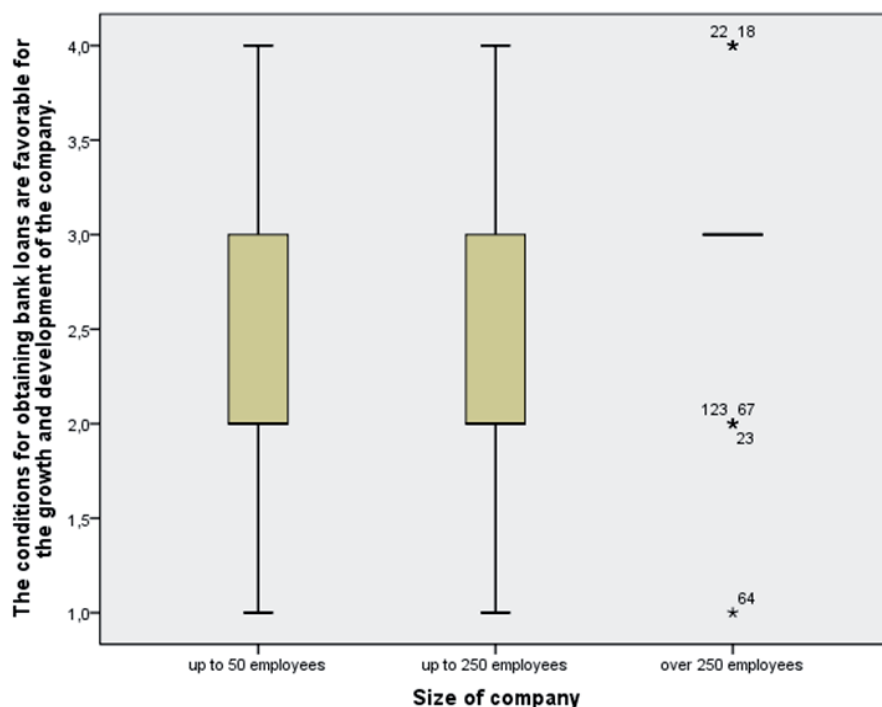
Graph 2. Conditions for obtaining bank loans in relation to the size of the company
Source: Authors' calculation

When analyzing the favorability and availability of bank loans for business growth and development only between companies with Up to 50 employees and Up to 250 employees, the Mann-Whitney U test did not identify a statistically significant difference in their assessments.

Regarding the availability of financing sources for SMEs from the capital market, companies rated it very poorly, with an average score of 1.73. Both the Median and Mode are 2, indicating that the majority of responses are clustered around this low value. The coefficient of variation is 39.54%, showing moderate variability in responses. The data also exhibits a moderate positive skewness (Skewness = 0.549), meaning that a small number of companies gave slightly higher ratings compared to the majority.

The 1.5*IQR range is from 1 to 3, with a single outlier value of 4, reflecting the overall perception that access to capital market funding is very limited for SMEs.

Graph 3. Availability of financing sources from the capital market
Source: Authors' calculation

The Kruskal-Wallis Test revealed a statistically significant difference in the perceived availability of financing sources from the capital market based on the size of the companies (Gp1, n = 50: Up to 50 employees; Gp2, n = 60: Up to 250 employees; Gp3, n = 17: Over 250 employees), χ^2(2, n = 127) = 13.006, p = 0.001. The results indicate that companies with Over 250 employees rated the availability of financing sources from the capital market most favorably, as reflected by their highest mean rank.

From Graph 4, it is evident that the 1.5*IQR range for companies with Up to 50 employees and Up to 250 employees spans from 1 to 3. However, for companies with Over 250 employees, the range is broader, from 1 to 4, suggesting a slightly more favorable perception of capital market financing among larger companies. When considering the availability of financing sources from the capital market for companies with Up to 50 employees and Up to 250 employees only, the Mann-Whitney U test did not detect a statistically significant difference in the assessments. However, companies with Up to 250 employees had a slightly higher Mean Rank, which is also evident from Graph 4.
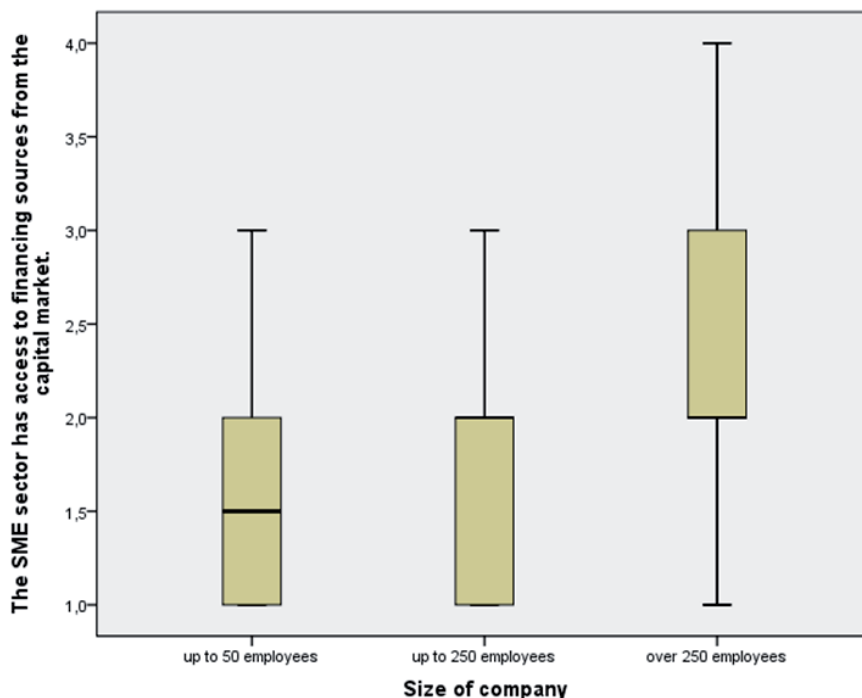
Graph 4. Availability of financing sources from the capital market by company size
Source: Authors' calculation

Regarding the availability of foreign financing sources, companies gave an average score of 2.31. The Median and Mode are both 2, and the coefficient of variation is 29.13%, indicating relatively low variability. The variable demonstrates a very strong positive skewness (Skewness = 1.229), meaning that only a small proportion of companies perceive foreign financing sources as more accessible. The Kruskal-Wallis Test did not reveal a statistically significant difference in the perception of foreign financing availability based on company size. This suggests that companies of all sizes in Serbia face challenges with the lack of access to foreign financing sources.

As for the availability of investment loans under adequate conditions, companies rated it with an average score of 2.27, with Median and Mode also at 2. The coefficient of variation is 29.60%, again indicating relatively low variability. The variable exhibits moderate positive skewness (Skewness = 0.422), reflecting that only a minority of companies view investment loans as more readily available under acceptable terms. These findings highlight ongoing difficulties across company sizes in obtaining adequate financial support.

The Kruskal-Wallis Test identified a statistically significant difference in the assessment of the availability of investment loans under adequate conditions by company size (*Gp1, n=50: Up to 50 employees, Gp2, n=60: Up to 250 employees,* and *Gp3, n=17: Over 250 employees*), $\chi2(2,n=127)=6.593,p=0.037\chi^2(2, n=127) = 6.593, p=0.037$ $\chi2(2,n=127)=6.593,p=0.037$. Companies with *Over 250 employees* rated the availability

of investment loans under adequate conditions most favorably, having the highest Mean Rank.
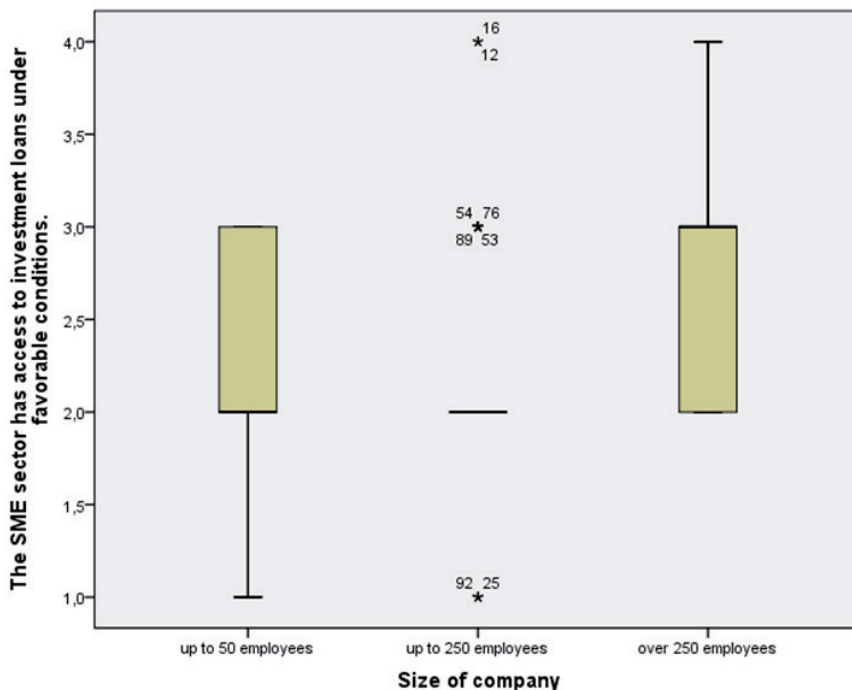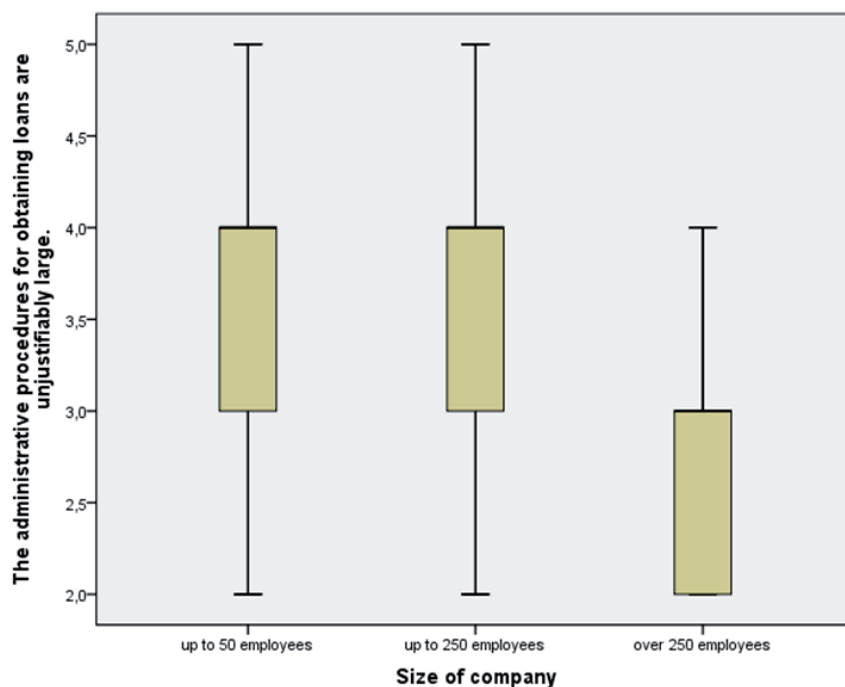

Graph 5. Availability of investment loans under adequate conditions for the size of the company
Source: Authors' calculation

The analysis of the favorability of administrative procedures in the loan application process shows a relatively higher average score compared to previously examined variables (mean = 3.57). The median and mode are 4, the coefficient of variation is 19.52% (indicating relatively low variability), and the variable exhibits a strong negative skewness (Skewness = -0.743), meaning that most respondents gave high ratings.

The Kruskal-Wallis Test revealed a statistically significant difference in the assessment of administrative procedure favorability during the loan process by company size (*Gp1, n=50: Up to 50 employees, Gp2, n=60: Up to 250 employees,* and *Gp3, n=17: Over 250 employees*), $\chi2(2,n=127)=15.701, p<0.001 \backslash chi^2(2, n=127) = 15.701$, p $< 0.001 \chi 2(2,n=127)=15.701,p<0.001$.

Interestingly, smaller companies (*Up to 50 employees* and *Up to 250 employees*) rated administrative procedures more favorably (higher Mean Rank) compared to larger companies (*Over 250 employees*). This finding suggests that larger companies perceive the bank loan administrative procedures as more complex and less favorable, potentially due to stricter regulatory scrutiny or more extensive documentation requirements associated with larger loan amounts or complex financing structures.

Graph 6. Favorability of administrative procedures in the process of obtaining loans according to the size of the company
Source: Authors' calculation

From Table 1, it can be observed that a significant linear correlation exists only between the variables: The SME sector has access to foreign sources of financing and The SME sector has access to investment loans under favorable conditions.

Table: 1 Correlations

	1	2	3	4	5
1.The conditions for obtaining bank loans are favorable for the growth and development of the company.	-				
2.The SME sector has access to financing sources from the capital market.	,271**	-			
3.The SME sector has access to foreign sources of financing.	,353**	,491**	-		
4.The SME sector has access to investment loans under favorable conditions.	,300**	,485**	,677**	-	
5.The administrative procedures for obtaining loans are unjustifiably large.	-,300**	-,162	-,324**	-,157	-

**. Correlation is significant at the 0.01 level (2-tailed)

Source: Authors' calculation

Conclusion

The research in this paper has shown that the SME sector in Serbia faces significant challenges when external sources of financing for growth and development are required. Primarily, bank loans, which are the most common form of external financing, are unfavorable due to high interest rates, loan terms, and collateral requirements. This sector often lacks sufficient business assets to pledge for obtaining credit funds to finance its needs. While government institutions provide some support for financing, it is limited and mostly intended for the initial stages of business operations. Later on, businesses are left entirely at the mercy of market conditions. Enterprises that employ more than 250 people have a slightly better position in the banking sector, as they possess larger assets that can serve as collateral for loan repayment.

In order to obtain investment loans, numerous prerequisites must be met by the company and they face various costs associated with loan approval, such as property insurance and the pledge of the insurance policy in favor of the bank, real estate valuation, costs for obtaining a credit bureau report, one-time fees for loan approval and other administrative costs. Furthermore, the grace period for loan repayment is not tailored to the specific needs and nature of the business activities the company engages in. All of these factors indicate that, under current conditions, SME sector cannot seriously rely on significant amounts of investment loans, which are essential for expanding operations, introducing new products and technologies and entering international markets.

Financial market is the most important element of the financial system for financing the economy and businesses. The financial system in Serbia is highly bank-centric, as banks play the leading role in the growth of Serbia's financial system. Due to the shallowness of the capital market, businesses rely on bank loans as the primary external source of financing. The bond market and other debt securities virtually do not exist. The Belgrade Stock Exchange is still in transition, as it mainly deals with stocks from the privatization process and has not managed to rise to a level where domestic companies can raise capital, thereby securing alternative sources of financing. Without a developed capital market, it is impossible to achieve above-average economic growth rates or a higher gross domestic product. The domestic stock exchange is completely marginalized and lacks support from local economic policymakers.

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THE IMPACT OF SOUTH AFRICA'S MANUFACTURING OUTPUT GROWTH ON LESOTHO'S ECONOMIC GROWTH: AN EXAMINATION OF KALDOR'S FIRST LAW

Abstract

Purpose - This study investigates the applicability of a modified Kaldor's First Law in the context of Lesotho's economic growth, with particular focus on the role of South Africa's manufacturing sector output as a key driver.

Research design/method/approach - This study employs a modified Kaldor's framework, incorporating gross domestic product of Lesotho for economic growth as the dependent variable, Lesotho manufacturing sector output, South Africa's manufacturing sector output, capital investment proxy by gross fixed capital formation of Lesotho, and population of Lesotho as explanatory variables. With date series from 1980 to 2022, the study applied descriptive statistics, correlation analysis, and econometric estimation technique (Autoregressive Distributed Lag modelling) to explore both short-run and long-run period relationships.

Findings - The descriptive and correlation analysis highlight the interconnectedness of these variables, with the ARDL bounds test confirming the presence of a long-term cointegration relationship. The results reveal that South Africa's manufacturing sector output indeed have a positive and statistically significant impact on Lesotho's GDP in the long run thereby validating the modified Kaldor's First Law, same is Lesotho capital investment.

Practical implication - The study's findings underscore the importance of South Africa's manufacturing sector in driving economic growth in Lesotho, emphasizing the role of cross-border economic linkages. Lesotho can capitalize on the positive spillover effects of South Africa's manufacturing sector, improve its investment climate, and achieve sustainable economic growth. This study contributes to the discourse on Kaldor's Law and intercountry collaboration. Actionable insights for Lesotho's policymakers are suggested.

Originality/Value - This study contributes to literature on Kaldor's First Law by extending its application and relevance to inter-country context.

Key words: Kaldor's First Law, Landlocked Country, Lesotho, South Africa.

JEL classification: O40, 014

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УТИЦАЈ РАСТА ПРОИЗВОДЊЕ У ЈУЖНОЈ АФРИЦИ НА ЕКОНОМСКИ РАСТ ЛЕСОТА: ИСПИТИВАЊЕ КАЛДОРОВОГ ПРВОГ ЗАКОНА

Апстракт

Сврха - Ова студија истражује применљивост модификованог Калдоровог првог закона у контексту економског раста Лесота, са посебним фокусом на улогу производње производног сектора Јужне Африке као кључног покретача.

Дизајн/метод/приступ истраживања - Ова студија користи модификовани Калдоров оквир, укључујући бруто домаћи производ Лесота за економски раст као зависну променљиву, производњу производног сектора Лесота, производњу производног сектора Јужне Африке, замену капиталних инвестиција кроз бруто инвестиције у фиксни капитал Лесота и број становника Лесота као објашња-вајуће променљиве. Са датумским серијама од 1980. до 2022. године, студија је применила дескриптивну статистику, анализу корелације и технику економет-ријске процене (ауторегресивно дистрибуирано моделирање кашњења) како би се истражили и краткорочни и дугорочни периодски односи.

Резултати - Дескриптивна и корелациона анализа истичу међусобну пове-заност ових варијабли, при чему ARDL тест граница потврђује присуство ду-горочног коинтеграционог односа. Резултати показују да производња у произ-водном сектору Јужне Африке заиста има позитиван и статистички значајан утицај на БДП Лесота на дужи рок, чиме се потврђује модификовани Калдоров први закон, исто важи и за капиталне инвестиције у Лесото.

Практична импликација - Резултати студије истичу важност производног сектора Јужне Африке у покретању економског раста у Лесоту, наглашавајући улогу прекограничних економских веза. Лесото може да искористи позитивне ефекте преливања производног сектора Јужне Африке, побољша своју инвести-циону климу и постигне одрживи економски раст. Ова студија доприноси дис-курсу о Калдоровом закону и међудржавној сарадњи. Предлажу се практични увиди за креаторе политике Лесота.

Оригиналност/Вредност - Ова студија доприноси литератури о Калдоро-вом првом закону проширујући његову примену и релевантност на међудржав-ни контекст.

Кључне речи: Калдоров први закон, земља без излаза на море, Лесото, Јужна Африка.

Introduction

Landlocked Countries (LLCs), majority of which are developing countries are unique economic entities whose development trajectories are significantly shaped by their geographic positioning, primarily the absence of direct access to the sea (United Nations, 2020). These countries depend on neighbouring countries for access to seaports for their export and import (Kafilah & Tregenna, 2024), thereby indirectly increasing their reliance on the infrastructural

efficiency, political stability, and economic policies of their neighbours (ESCAP, U. (2020). This geographical limitation places these LLDCs at a disadvantage in terms of trade, transport, and connectivity to global markets. Apparently, limitation leads to challenges of inadequate access to international markets, high dependency on transport corridors controlled by neighbouring states, and greater exposure or vulnerability to cross-border risks such as political instability, trade restrictions, and economic shocks. As a result, these LLDCs face higher transportation and transaction costs which affect their competitiveness in international trade (Adhikari et al., 2024; Paudel & Cooray, 2018). Likewise, they often experience lower economic growth, weaker industrial development, and higher vulnerability to global economic fluctuations compared to their coastal counterparts (UN-OHRLLS, 2013; Dairabayeva, 2013).

The interconnected nature of modern economies highlights the importance of cross-border economic interdependence. For LLDCs, neighbouring coastal economies play a vital role in their development due to the critical role of transit corridors and trade networks (Frederic et al., 2021). This interdependence implies that the growth dynamics of neighbouring economies, particularly the strength of their manufacturing sectors can significantly influence the economic performance of LLDCs. It need be mentioned that the role of the manufacturing sector as a driver of economic growth especially for developing countries is well-documented in the literature (Mnguni and Simbanegavi, 2020; Pata and Zengin, 2020; Sallam, 2021; Tsukada, 2024; Lugina et al. 2022). Such that the manufacturing sector is regarded as a "growth engine" due to its ability to generate employment, enhance productivity, promote technological advancement, and inter-sectoral linkages that encompasses both upstream supply chains and downstream processing and distribution networks. Neighbouring coastal countries with strong manufacturing sectors offer LLDCs the opportunity to integrate into regional value chains. For instance, LLDCs can supply raw materials or intermediate inputs to neighbouring manufacturing firms, thereby enhancing their own production capacities. In addition, neighbouring economies with well-developed infrastructure, efficient customs procedures, and modern logistics networks reduce the transit costs for LLDCs, making their exports more competitive in international markets. Regional trade agreements, customs unions, and bilateral trade agreements further facilitate this integration, providing LLDCs with an opportunity to leverage their neighbours' manufacturing capacity to boost their own economic growth. Besides, there can be knowledge spillovers arising from the transfer of technical know-how, skills, and innovations from manufacturing firms in neighbouring economies to local firms in LLDCs. These spillovers can enhance the technological capabilities of LLDCs' domestic firms and improve productivity. Workers from the landlocked economy may migrate to the neighbouring economy for employment in its manufacturing sector. The remittances they send back home contribute to the landlocked economy's GDP.

The sub-Saharan Africa, Central Asia, and South America regions are hosts to the 32 LLDC countries identified by the United Nations, including Lesotho. The economic growth trend in Lesotho from 2017 to 2022 highlights significant structural challenges. With four consecutive years of negative growth (-3.14%, -1.48%, -1.41%, -7.46%) and modest recoveries of 1.85% in 2021 and 1.29% in 2022, it is evident that Lesotho faces internal and external barriers to sustained economic expansion. The prolonged period of low economic performance in Lesotho from 2017 to 2022 has several significant consequences, both at the macroeconomic and socio-economic levels. The consequences include high unemployment relative to its population (estimated at averagely 17.1%) (World Bank, 2024), low human

development with a human development index of 0.51 (UNDP, 2024), poor household welfare, and weak fiscal positioning among others. One of the most prominent constraints on Lesotho's economic growth is its geographical positioning as a landlocked country, surrounded by South Africa. This unique geographical feature imposes substantial economic and logistical dependencies on its larger neighbour. Lesotho relies on South Africa's economic environment and performances for instance for inputs, production linkages, and trade facilitation, as well as access to critical regional and international markets.

While Kaldor's First Law emphasizes the positive relationship between manufacturing output growth and overall economic growth, this relationship is more complex for LLDCs like Lesotho, where the neighbouring economy's manufacturing sector plays an important role. Lesotho's heavy reliance on South Africa's production capacity, importation of intermediate goods, and revenue from the Southern African Customs Union (SACU) introduces asymmetries in economic linkages. Moreover, Lesotho's domestic manufacturing sector remains underdeveloped, with limited capacity to produce higher-value exports or establish meaningful backward and forward linkages in regional value chains. Despite its participation in regional economic agreements like SACU and SADC, Lesotho's growth remains significantly shaped by the performance of South Africa's manufacturing sector. This dependency poses critical questions about Lesotho's ability to achieve structural economic transformation. Apparently, these asymmetries require a modification of Kaldor's First Law to reflect the indirect impact of neighbouring economies on LLDCs. Testing a modified Kaldor's First Law, which accounts for the role of neighbouring economies' manufacturing sectors, is crucial for understanding how such dependence affects the growth trajectories of LLDCs like Lesotho.

Thus, the main objective of this study is to examine the impact of a neighbouring (coastal) economy's manufacturing sector growth on the economic growth of Lesotho a LLDC using a modified version of Kaldor's First Law. The specific objectives are i) to test Kaldor's First Law in the context of LLDCs and a modified Kaldor's First Law that incorporates the influence of the neighbouring economy's manufacturing sector, ii) to empirically analyse the extent to which growth in the manufacturing sector of a neighbouring economy influences the economic performance of a LLDC, Lesotho. This study contributes to literature on Kaldor's First Law by extending its application to cross-border linkages.

Literature review

Kaldor's (1966) first law posits that the growth of the manufacturing sector an economy serves as an engine of overall economic growth for same economy. This proposition, rooted in structuralist economics, asserts that an increase in manufacturing output stimulates GDP growth due to technological progress, economies of scale, and backward and forward linkages with other sectors. Over the past decades, researchers have continued to explore the validity of this law in both developed and developing economies. A summary of brief empirical findings is summarized in Table 1.

Table 1: Summary of Brief Empirical Findings

Author(s)	Region/Country	Period	Methodology	Key Findings
Pata and Zengin (2020)	Turkey	1980–2014	Symmetric & Asymmetric Causality	Industry value-added positively affects growth, supporting Kaldor's first law.
Ferraz (2024)	Portugal	1950–2019	Vector Autoregressive (VAR)	1% growth in basic metallurgical industries leads to a 0.07% rise in GDP.
Lazarov (2024)	North Macedonia	2002-2022	OLS	Manufacturing sector positively affects growth, supporting Kaldor's first law.
Tsukada (2024)	Vietnam, Indonesia, Malaysia, Thailand, Philippines	1986-2020	Fully modified ordinary least squares	Kaldor's law held for all countries except the Philippines.
Karami et al. (2019)	25 European Economies	1995-2016	OLS, Fixed-Effects Models	Manufacturing significantly influences GDP, supporting Kaldor's first law.
Keho (2018)	11 ECOWAS Countries	1970–2014	ARDL, Granger Causality Tests	Manufacturing growth positively affects economic growth in 8 of 11 countries.
Mongale & Tafadzwa (2018)	South Africa	1980–2016	Vector Error Correction Model (VECM)	Manufacturing output positively contributes to economic growth in South Africa.
Moyo & Jeke (2019)	37 African Countries	1990–2017	System-GMM Model	Manufacturing value positively affects GDP in African countries.
Wan et al. (2022)	130 Developing Countries	1996–2019	GMM, OLS, Fixed-Effects Regression	Manufacturing positively contributes to growth; exports play an indirect role.
Sichoongwe (2024)	Uganda	1990–2022	Time-Series Analysis	Manufacturing growth significantly drives GDP growth, supporting Kaldor's law.
Habanabakize & Dickason-Koekemoer (2023)	South Africa	1998-2019	ARDL, Error Correction Model (ECM)	Industrialization (e.g., automotive and metal industries) drives economic growth.
Sallam (2021)	Saudi Arabia	1985-2017	VECM	Bidirectional causal link between manufacturing and economic growth.
Edward & Ngasamiaku (2021)	Tanzania	1985–2017	OLS	Economic growth Granger-causes manufacturing growth, contradicting Kaldor's law.

A critical review of these studies reveals a consensus on the role of the manufacturing sector in driving economic growth, underscoring a strong empirical support for Kaldor's first law. The studies employ diverse methodologies, including OLS, GMM, ARDL, VAR, and VECM models, and span various regions, including Africa, Asia, and Europe. While many of these studies provide robust evidence for the positive impact of domestic manufacturing on GDP, they overlook the potential spillover effects of larger, open economies on the GDP of smaller, landlocked economies. While studies like those by Keho (2018) and Moyo and

Jeke (2019) analyze multiple African countries, they do not explicitly address cross-border manufacturing effects. This oversight is significant, as countries like Lesotho, which rely heavily on trade with larger neighbours like South Africa, may experience unique growth dynamics driven by the industrial output of these larger economies. Addressing this gap could provide crucial insights for policymakers in landlocked developing countries and for the extension or applicability of the Kaldor's first law in another context.

Research Design, Methodology, and Research Tasks

Research Design and Data

To investigate the impact of the manufacturing sector growth of South Africa (a larger open economy) on the GDP of Lesotho (a smaller landlocked economy), this study applied a quantitative research method, and it used time series data that were obtained from the World Bank Development Indicator database for a period of 43 years (1980 to 2022). Variables considered in the study include Gross Domestic Product of Lesotho, Gross Fixed Capital Formation of Lesotho, the population of Lesotho and manufacturing sector output growth of South Africa.

Model Estimation

While Kaldor's First Law focuses on the role of a country's own manufacturing sector in driving its economic growth as reflected in equation (1),

$$GDPL_t = \alpha_0 + \alpha_1 MSL_t + e_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

This study proposes a modification of the law to include the role of a neighbouring economy's manufacturing sector. The premise of this modified law is that, for LLDCs, economic growth is not solely dependent on the performance of their own manufacturing sector but also on the growth dynamics of neighbouring countries' manufacturing sectors. This is particularly relevant for LLDCs that have limited domestic manufacturing capacity but maintain strong trade and production linkages with neighbouring economies. Thus, in line with theory and orientation of this study (that is the modification of Kaldor's first law), GDP growth of Lesotho is a function of its own manufacturing sector output growth and that of its' neighbouring country, South Africa. Therefore, equation (1) is extended as follows.

$$GDPL_t = \alpha_0 + \alpha_1 MSL_t + \alpha_2 MSSA_t + e_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

Furthermore, in line with previous studies (Aslan & Altinoz, 2022; Achar et al., 2024; Alemu, 2020; Ajayi, 2024) control variables are included in this study to avoid errors in bivariate modelling, enhance precision and accuracy and improve the model fit. Consequently, capital investment proxy by gross fixed capital formation (GFCF) and population are included in the model. Thus, the multivariate model specification showing the relation among variables of interest and other economic and demographic factors is expressed as follows:

$$GDPL_t = \alpha_0 + \alpha_1 MSL_t + \alpha_2 MSSA_t + \alpha_3 Z_t + e_t \dots\dots\dots\dots(2)$$

Where GDPL stands for the gross domestic product of Lesotho, it is the dependent variable representing the overall economic output of Lesotho. MSSA is manufacturing sector output growth of South Africa, Z is a vector of control variables considered in this study. Supported by various studies (Poku et al., 2022; Aslan & Altinoz, 2022; Meyer & Sanusi, 2019; Achar et al., 2024, Alimi et al. 2021; Alemu, 2020; Ajayi, 2024), control variables are gross fixed capital formation of Lesotho and population of Lesotho represented as GFCFL and PopL, respectively. MSL and MSSA are main independent variable representing the growth in Lesotho and South Africa's manufacturing sector output, respectively, which serves as the channel for potential spillover effects on Lesotho's GDP, as presented in the literature review section.

Analytical Techniques: Econometric Analysis Procedure

To estimate the relationship between South Africa's manufacturing output and Lesotho's GDP, both descriptive and inferential or econometrics modelling techniques were used. For econometrics modelling, the study employs the widely applied Autoregressive Distributed Lag (ARDL) estimation tool introduced by Pesaran et al. (2001). The ARDL approach is suitable due to its capacity to estimate relationships irrespective of whether the variables are integrated of order I(1), or a combination of both I(0) and I(1), though the dependent variable is expected to be an I(1) variable (Sam et al., 2019). This makes it appropriate for time-series data that may exhibit mixed levels of stationarity. The key step of the analysis comprises of testing of unit root, specification of the ARDL model, model lag length selection, determining of long-run relationship or otherwise, long-run and short-run analysis estimation, and estimated model validation. Through the comprehensive ARDL approach, the study provides empirical evidence on the extent to which South Africa's manufacturing growth influences the economic growth of Lesotho. This methodology allows for the analysis of both long-run equilibrium relationships and short-run adjustments, offering an understanding of the cross-border manufacturing-GDP link in a landlocked developing economy context.

Research results and Discussion

Stationarity and Cointegration Test Results

Following a descriptive and correlation analysis of variables (though not reported), necessary econometric pre-estimation tests were conducted. Table 1 reports the results of the Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) unit root tests of stationarity for the variables *lnGDPL*, *lnMSL*, *lnMSSA*, *lnGFCFL*, and *lnPOPL*. The results indicate that *GDPL*, *MSSA*, and *GFCFL*0 are non-stationary at level but become stationary at first difference, denoted as I(1). This is evidenced by significant test statistics at the 1% level for both ADF and PP tests after first differencing. On the other hand, *POPL* is stationary at level (I(0)) under the PP test, but the ADF test indicates non-stationarity, suggesting a mixed conclusion for the population variable. The integration order of the variables has important implications for the estimation approach. Since most variables are I(1), the use of the ARDL bound testing approach to assess cointegration is appropriate.

Table 1: ADF and Phillip-Perron unit root test results

	ADF		P-P		Decision
	Level	First Difference	Level	First Difference	
*Ln*GDPL	-1.1237	-4.7473*	-0.9993	-4.8594*	I(1)
*ln*MSL	-3.3298**	-	-3.4822	-	I(0)
*ln*MSSA	-1.0999	-6.8497*	-1.0693	-6.9103	I(1)
*ln*GFCFL	-2.6812***	-4.7148*	-2.4006	-4.9137*	I(1)
*ln*POPL	-0.6898	-2.1751	-3.3418*	-	I(0)

Source: Computed by Authors

Also, using the AIC to select the lag length automatically, Table 2 provides the results of the ARDL bounds tests approach for establishing the long-run relationship among the variable, where it is shown that the calculated F-statistic of each of the models (9.82, 7.05, 5.62) are significantly higher than the upper bound critical values at all significance levels (10%, 5%, 2.5%, and 1%). Since the F-statistic exceeds the upper bound, it implies the existence of a long-run cointegration relationship between the dependent variable (*lnGDPL*) and the independent variables in each of the models. This result confirms the relevance of the modified Kaldor's First Law in the context of Lesotho's economy.

Table 2: Bound test (F-stat) results

Model	**Model 1**	**Model 2**	**Model 3**
Lag Order	***ARDL (2,3, 0, 3)***	***ARDL (1, 4, 4, 0)***	***ARDL (4,0, 4, 4, 1)***
K	3	3	4
F-statistic	9.82	7.05	5.62
Bounds 10% [I(0), I(1)]	[2.37, 3.20]	[2.37, 3.20]	[2.20, 3.09]
Bounds 5% [I(0), I(1)]	[2.79, 3.67]	[2.79, 3.67]	[2.56, 3.49]
Bounds 2.5%[I(0), I(1)]	[3.15, 4.08]	[3.15, 4.08]	[3.88, 3.87]
Bounds 1% [I(0), I(1)]	[3.65, 4.66]	[3.65, 4.66]	[3.29, 4.37]

Source: Computed by Authors

ARDL Estimation Result

Table 3 presents the short-run and long-run estimation results of the ARDL model. The results offer valuable insights into the nature of the relationships between Lesotho's Gross Domestic Product (GDPL) and the explanatory variables: Manufacturing Sector Output of South Africa (MSSA), Gross Fixed Capital Formation of Lesotho (GFCFL), and Population of Lesotho (POPL).

Panel 1: Long-term estimates

The long-run coefficient of Lesotho's manufacturing sector output (*lnMSL*) is positive (0.4516) and statistically significant as shown in the Table 3. The coefficient primarily validating Kadlor's first law indicates that all things being equal, 1% increase in Lesotho's manufacturing sector output is associated with about 0.45% increase in Lesotho's GDP. Similarly, the testing of the modified Kadlor's first law in models 2 and 3 is validated through the estimated positive coefficients of South Africa's manufacturing output. The positive and

highly significant coefficients of *lnMSSA* (model 2 = 0.9015; model 3 = 0.8305) indicates that a 1% increase in South Africa's manufacturing output is associated with a 0.90% and 0.83% increase in Lesotho's GDP in the long run. This result is consistent with Kaldor's First Law, which posits that manufacturing is a critical engine of growth. The result is also aligned with those from previous studies (Pata and Zengin, 2020; Ferraz, 2024; Karami et al., 2019; Moyo and Jeke, 2019; Sichoongwe, 2024) as discussed in the literature review section. Furthermore, it is surprising to note from the result in Table 3 that comparatively, the impact of South Africa's manufacturing output on Lesotho's GDP is higher than the manufacturing sector output of Lesotho itself. The high magnitude of these coefficient underscores Lesotho's economic dependence on South Africa's industrial sector, given the close trade and labour linkages between the two countries. Plausible reasons for this outcome include Lesotho's reliance on imports of manufactured goods and the role of remittances from Lesotho's labour force employed in South Africa's manufacturing sector.

The coefficients of capital investment proxy by gross fixed capital formation (*lnGFCFL*) are positive (model 1 =0.4346; model 2 = 0.2705; model 3 = 0.2029) and statistically significant in all the models as seen in Table 3. These findings imply that a 1% increase in fixed capital investment in Lesotho is associated with about 0.2029% to 0.4346% increase in GDP when other factors are held constant. This result aligns with growth theories and several previous studies (Poku et al., 2022; Aslan & Altinoz, 2022; Meyer & Sanusi, 2019; Achar et al., 2024) that emphasize and empirically demonstrated the role of investment in physical capital in driving economic growth. Possible reasons for this outcome are the enhanced production capacity and expanded economic output through public and private sector investments in infrastructure, machinery, and other productive capital.

The coefficient for population (*lnPOPL*) is negative (-0.8725) and statistically significant. This result is counterintuitive, as population growth is often expected to have a positive impact on GDP due to an increase in labor supply and market size. However, in the context of Lesotho, the negative sign may reflect the adverse effects of population pressures, such as unemployment, strain on public resources, and underemployment. Additionally, Lesotho's population growth might be outpacing the country's capacity to create jobs, leading to a negative impact on economic growth. This result could also reflect the demographic transition, where a larger share of the population may be dependent, rather than economically active.

Panel 2: Short-term estimates

Primarily, the coefficients for the error correction terms (CointEq(-1)) resented in the Table 3 are all negative (-0.2091, -0.5494, -1.0171) and statistically significant at the 1% level of significance as required. This indicates that, respectively 22%, 54.94%, and 1.02% of the deviations from the long-run equilibrium are corrected each period. This high speed of adjustment especially for models 2 and 3 highlights the strong long-term relationship among the variables, suggesting that Lesotho's economy adjusts relatively quickly to shocks that push GDP away from its equilibrium path.

Table 3: *ARDL Regression Estimation Result*

Variable	Model 1 ARDL (2,3,0,3) Coef.	Model 2 ARDL (1, 4, 4, 0) Coef.	Model 3 ARDL (4,0, 4, 4, 1) Coef.
Panel 1: Long-term estimates			
lnMSL	0.4516*	-	0.0467***
lnMSSA	-	0.9015*	0.8305*
lnGFCFL	0.4346*	0.2705*	0.2029*
lnPOPL	-3.8886**	-0.8725*	-0.0474
C	60.4363*	6.7305	-3.1616
Panel 2: Short-term estimates			
D(LNGDPL(-1))	-0.2496***	-	0.2951**
D(LNGDPL(-2))	-	-	0.4379*
D(LNGDPL(-3))	-	-	0.2860**
D(LNMSL)	0.1055**	-	-
D(LNMSL(-1))	-0.0403	-	-
D(LNMSL(-2))	-0.0678**	-	-
D(LNMSA)	-	0.3855*	0.4599*
D(LNMSSA(-1))	-	-0.2210*	-0.3300*
D(LNMSSA(-2))	-	-0.1982*	-0.3095*
D(LNMSSA(-3))	-	-0.1419**	-0.2184*
D(LNGFCFL)	-	0.0703*	0.0252
D(LNGFCFL(-1))	-	-0.0435***	-0.1358*
D(LNGFCFL(-2))	-	-0.0156	-0.0829*
D(LNGFCFL(-3))	-	-0.0402**	-0.0788*
D(LNPopL)	6.0123	-	2.6462*
D(LNPopL(-1))	-12.6277**	-	-
D(LNPopL(-2))	8.2738**	-	-
CointEq(-1)/$ECeq_{t-1}$	-0.2091*	-0.5494*	-1.0171*
R²	0.7241	0.8587	0.8969
Adjusted R²	0.6637	0.8210	0.8493
Durbin-Watson Stat	2.0422	1.9165	1.8935

Note: ***, **, * denotes significant at 1%, 5%, and 10%.

The positive coefficient (0.3855) for the first difference of *lnMSSA* indicates that in the short term, a 1% increase in South Africa's manufacturing output is associated with a 0.3855% increase in Lesotho's GDP. This result confirms the immediate spillover effects of South Africa's manufacturing sector on Lesotho's economy. Given the dependence on imports and employment ties, Lesotho's economy responds quickly to changes in South Africa's manufacturing sector. The negative coefficients for the first, second, and third lags of *lnMSSA* [D(*lnMSSA*(-1)) (-0.2210, p < 0.01), D(*lnMSSA*(-2)) (-0.1982, p < 0.01), D(*lnMSSA*(-3)) (-0.1419, p < 0.05):] suggest that while the immediate effect of an increase in South Africa's manufacturing output is positive, the effect dissipates over subsequent periods. This diminishing impact might be due to adjustment processes or the delayed effects of demand and supply changes, particularly for products with longer production cycles

or delayed payments for exports and imports. It could also be reflective of the short-term volatility of trade-dependent economies.

The positive short-term coefficient of *lnGFCFL* (0.0703, p < 0.01) indicates that a 1% increase in investment in fixed capital results in a 0.0703% increase in GDP in the same period. This short-term positive relationship is in line with economic growth theory, where increased investment in physical capital enhances production capacity and economic output. The coefficients for the lagged differences of *lnGFCFL* reveal a mixed pattern. While the first and third lags are negative and significant, the second lag is negative but insignificant. This pattern may reflect the gestation period for capital investments, where the effects on production are not immediate. For instance, the construction of infrastructure projects typically takes time before generating productive returns, leading to delayed or staggered effects on GDP.

Model Fit and Diagnostic Measures

The R-squares (0.8587) and Adjusted R-squared (0.8210) values in Table 4 indicate that the explanatory variables explain approximately 85.87% of the variation in Lesotho's GDP, confirming the strong predictive power of the ARDL model. Durbin-Watson Statistic (1.9165): The value of the Durbin-Watson statistic is close to 2, suggesting no serious issues of autocorrelation in the residuals. Similarly, Table 5 provides the results of key diagnostic tests to ensure model robustness and validity. The Jarque-Bera test for normality test statistic (2.6189) and probability (0.2700) indicate that the residuals are normally distributed. Breusch-Godfrey Serial Correlation LM Test statistic of 0.0442 and probability of 0.9569 indicate that there is no evidence of serial correlation in the residuals, which confirms the reliability of the estimates. Additionally, the test statistic (0.4519) and probability (0.9248) result for Breusch-Pagan-Godfrey test for heteroscedasticity suggest that there is no heteroscedasticity in the residuals, satisfying the homoscedasticity assumption. These diagnostic results confirm the model's robustness, ensuring that the estimated coefficients are unbiased, consistent, and efficient. The combined evidence from Tables 1 to 5 supports the validity of the modified Kaldor's First Law in the case of Lesotho in relation to her neighboring country (South Africa), demonstrating that manufacturing sector output (MSSA) in South Africa plays a crucial role in driving economic growth of Lesotho, alongside Lesotho's gross fixed capital formation and population dynamics.

Table 5: Diagnostics Test

	Model 1 ARDL (2,3,0,3)	Model 2 ARDL (1, 4, 4, 0)	Model 3 ARDL (4,0, 4, 4, 1)
Jarque-Bera Test for Normality (prob.)	3.2220 (0.1997)	2.6189 (0.2700)	1.1025 (0.5762)
Breusch-Godfrey Serial Correlation LM Test	F-statistic: 0.5057 Prob. F (2,26): 0.6089	F-statistic: 0.0442 Prob. F (2,24): 0.9569	F-Statistic: 0.7699 Prob. F (2,19): 0.4770
Breusch-Pagan-Godfrey test for heteroscedasticity	F-Statistic: 1.0826 Prob. F (11,28): 0.4090	F-Statistic: 0.4519 Prob. F (12,26): 0.9248	F-Statistic: 0.6086 Prob. F (17,21): 0.8489

Source: Computed by Authors

Conclusion

This study examined the applicability of a modified Kaldor's First Law by empirically investigating the long-run and short-run relationship between Lesotho's economic performance proxied by gross domestic product (GDPL) and South Africa's manufacturing sector performance (MSSA), along with Lesotho's investment proxied by gross fixe capital formation and population. The study covers the period 1980-2022 for which consistent data were available and uses a range of econometric techniques including descriptive statistics, correlation analysis, unit root testing, ARDL bounds testing, and ARDL regression estimation. The key findings of the study are structured as follows:

Long-run Relationships: Evidence from the ARDL bounds testing procedure confirms the existence of a long-run cointegration relationship among the variables. In particular, the results indicate that MSSA, GFCFL, and POPL significantly influence Lesotho's GDP in the long term.

Role of Manufacturing Sector (MSSA): The most notable finding is the statistically significant and positive impact of South Africa's manufacturing sector on Lesotho's GDP. This validates the modified Kaldor's First Law in the context of cross-border economic interdependence, where the industrial expansion in a coastal country (South Africa) can drive economic growth in another (Lesotho), a close LLDC.

Policy Implications: The expansion and growth of the manufacturing sector of a country is reflected in the forms of expansion of production, out-sourcing of production input, employment generation, technological advancement and innovation, export growth, and foreign direct investment outflow, amongst others. Apparently, there is the possibility harnessing the spillover benefits of South Africa's manufacturing sector for Lesotho's GDP, if deliberate policy actions are put in place. Thus, to capture these spillover benefits, the government of Lesotho should implement a range of targeted policy measures that;

- Facilitate access to South Africa's manufacturing sector outputs.
- Promote technical and vocational skills partnerships with South African manufacturing firms.
- Drive or attract investment from South African manufacturers.
- Encourage joint ventures with Basotho businesses.
- Promote bilateral agreements on trade, investment, and labour with South Africa to formalize cooperation in the manufacturing sector.

In conclusion, the study provides empirical support for deeper South Africa-Lesotho integration and cross-border industrial collaboration as strategic levers for economic growth in Lesotho. Strengthening ties with South Africa's manufacturing sector may offer a viable pathway to sustained economic development in Lesotho.

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ANALYZING COMPETITION IN THE ROMANIAN TELEVISION MARKET THROUGH ECONOMIC CONCENTRATION INDICATORS

Abstract

Purpose – This paper investigates the degree of market concentration and competition in the Romanian television industry by analysing audience share as the core performance indicator. It aims to highlight the extent of dominance among leading broadcasters and the implications for market structure and media pluralism.

Research design/method/approach – The study applies standard industrial organization tools, specifically the Concentration Ratio (CR4) and the Herfindahl-Hirschman Index (HHI), to audience data from secondary sources. These indices are calculated for a selected time frame to evaluate short-term and structural concentration levels. The analysis reveals a moderately to highly concentrated television market in Romania, characterized by the dominant position of a few key players. Audience fragmentation and consolidation trends are discussed, along with their effects on competition and content diversity.

Practical implication – The findings offer valuable insights for media regulators and policymakers regarding antitrust measures and diversity policies. The methodology can be extended to other cultural and creative industries facing similar concentration dynamics.

Originality/Value – This study contributes to the empirical literature on media market competition by providing a case study focused on an emerging European economy. It demonstrates the utility of classical economic indicators in assessing media sector dynamics.

__Key words:__ television market, Romania, audience share, concentration ratio, Herfindahl-Hirschman Index, media competition

__JEL classification: L82, L13, C43, D40__

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АНАЛИЗА КОНКУРЕНЦИЈЕ НА РУМУНСКОМ ТЕЛЕВИЗИЈСКОМ ТРЖИШТУ КРОЗ ИНДИКАТОРЕ ЕКОНОМСКЕ КОНЦЕНТРАЦИЈЕ

Апстракт

Сврха – Овај рад истражује степен концентрације тржишта и конкуренције у румунској телевизијској индустрији анализирајући удео у публици као основни индикатор учинка. Циљ му је да истакне обим доминације међу водећим емитерима и импликације на структуру тржишта и медијски плурализам.

Дизајн/метод/приступ истраживања – Студија примењује стандардне алате индустријске организације, посебно Коефицијент концентрације (CR4) и Херфиндал-Хиршманов индекс (HHI), на податке о публици из секундарних извора. Ови индекси се израчунавају за одабрани временски оквир како би се проценили краткорочни и структурни нивои концентрације. Анализа открива умерено до високо концентрисано телевизијско тржиште у Румунији, које карактерише доминантан положај неколико кључних играча. Разматрају се трендови фрагментације и консолидације публике, заједно са њиховим ефектима на конкуренцију и разноликост садржаја.

Практична импликација – Резултати нуде вредне увиде за регулаторе медија и креаторе политике у вези са антимонополским мерама и политикама разноликости. Методологија се може проширити на друге културне и креативне индустрије које се суочавају са сличном динамиком концентрације.

Оригиналност/Вредност – Ова студија доприноси емпиријској литератури о конкуренцији на медијском тржишту пружајући студију случаја усмерену на европску економију у развоју. То показује корисност класичних економских индикатора у процени динамике медијског сектора.

Кључне речи: телевизијско тржиште, Румунија, удео у публици, коефицијент концентрације, Херфиндал-Хиршманов индекс, медијска конкуренција

Introduction

The television industry remains a cornerstone of mass communication, shaping public discourse, cultural narratives, and political engagement across societies. Despite the emergence of digital media and streaming services, traditional television continues to command significant influence, especially in countries where it remains the dominant source of news, entertainment, and information. In Romania, television retains a central role in the media ecosystem, with high audience penetration and sustained advertising revenues. Understanding how competition functions within this market is therefore of critical importance for ensuring media pluralism, fostering healthy market dynamics, and guiding appropriate regulatory interventions.

One of the fundamental concerns in media economics is the degree of market concentration and its implications for competition, consumer welfare, and content diversity. Market concentration occurs when a small number of firms hold a large share of the market,

potentially leading to monopolistic or oligopolistic structures that limit entry, reduce innovation, and endanger the diversity of viewpoints. In media markets, this concern is even more acute, given the dual nature of media products as both economic and cultural goods. The risk of excessive concentration in the television sector can lead to a narrowing of editorial perspectives, reduced accountability, and greater susceptibility to political or commercial influence.

This paper investigates the Romanian television market through the lens of industrial organization theory, applying quantitative indicators of market concentration to assess the competitive landscape. In doing so, it addresses both the economic and societal dimensions of concentration in a key segment of the media industry. The focus is placed on audience share as the primary metric for market performance, given its central role in determining advertising revenue and the strategic behaviour of broadcasters. By analysing audience data from secondary sources, the study applies two well-established concentration measures — the Concentration Ratio for the top four firms (CR4) and the Herfindahl-Hirschman Index (HHI) — to evaluate the extent to which the Romanian television market is dominated by a few major players.

The choice of CR4 and HHI as analytical tools is grounded in their widespread use in competition policy and antitrust enforcement. The CR4 offers a snapshot of the market share held by the four largest firms, providing an intuitive understanding of market dominance. The HHI, by incorporating the square of each firm's market share, accounts for the distribution of power among all market participants and is more sensitive to asymmetries. These indices are applied over a selected time frame, allowing the study to observe both short-term fluctuations and more persistent structural trends. The findings suggest a market that is moderately to highly concentrated, raising important questions about the barriers to entry, competitive behaviour, and the regulatory safeguards needed to maintain a diverse and competitive media environment.

Beyond offering a technical analysis of market indicators, the study also engages with broader policy debates. In emerging European economies such as Romania, where media systems have undergone rapid transformation since the post-communist transition, the structure of the television market reflects complex interactions between historical legacies, commercial pressures, and regulatory capacities. Although liberalization and privatization have introduced competition, concerns remain about ownership concentration, cross-media control, and the resilience of public service broadcasting. As such, this research contributes to the ongoing conversation on how best to promote media pluralism and safeguard democratic values in a context marked by institutional challenges and evolving audience behaviours.

From a methodological perspective, the paper contributes by adapting tools from industrial economics to the specificities of the media sector, offering a replicable framework for similar analyses in other countries or cultural industries. Given the scarcity of empirical research on media market concentration in Eastern Europe, this study fills a critical gap by providing evidence-based insights and a standardized approach to measuring dominance in a transitional media market.

In sum, this paper connects theory with practice in the study of media competition. Using the Romanian television industry as a case study, it shows the current state of the market and discusses what this means for policy, the public interest, and the future of audiovisual media in the region. The remainder of the paper is structured as follows: Section 2 outlines the theoretical background and a review of the literature; Section 3 presents the Research

Design, Methodology and Hypothesis formulation; Section 4 discusses the findings in light of media policy concerns; and Section 5 concludes with recommendations and avenues for future research.

Theoretical backgrounds and/or Literature review

Market concentration is a key construct in industrial organization theory. It reflects the extent to which a small number of firms control a large portion of the market, often serving as a proxy for competitive intensity. Economic theory suggests that high concentration may lead to reduced competition, higher prices, diminished innovation, and inefficiencies (Carlton & Perloff, 2015). In media markets, however, these effects are compounded by risks to content diversity, editorial independence, and democratic discourse (Doyle, 2002; Baker, 2007). This dual nature of media—both economic good and democratic institution—makes the assessment of market power particularly urgent.

Standard measures of market concentration include the Concentration Ratio for the top four firms (CR4) and the Herfindahl-Hirschman Index (HHI), both of which are extensively used in competition policy. CR4 summarizes the combined market share of the four largest firms, while HHI provides a more granular assessment by incorporating the square of each firm's market share, placing greater weight on larger firms (Rhoades, 1993; Owen & Wildman, 1992). These indices are considered reliable indicators of dominance and are used in merger evaluations and antitrust decisions by the European Commission and U.S. Department of Justice (European Commission, 2004; US DOJ, 2010).

The literature shows that even in liberalized markets, the television industry often trends toward high concentration. Picard (2002) and Noam (2009) document this phenomenon in Western economies, where deregulation did not necessarily result in more competitive or pluralistic outcomes. The Romanian case, by contrast, remains underexplored. Following the post-1989 transition, Romania moved from a state-controlled media system to a commercialized one, but without the development of robust regulatory institutions (Gross, 2004; Jakubowicz, 2007). This led to rapid consolidation, as private broadcasters acquired significant audience shares and advertising revenues, while the public broadcaster declined in influence and trust (Suciu, 2015).

Empirical studies suggest that high concentration in television markets is associated with content homogenization, reduced access for independent voices, and increased susceptibility to political or economic capture (McQuail, 2010; Napoli, 2008). These risks are particularly pronounced in emerging democracies, where media markets are often volatile, politicized, and underregulated (Mungiu-Pippidi, 2008). In Romania, several reports and academic contributions point to the concentration of ownership in the hands of a few media conglomerates, raising concerns about editorial independence and cross-media monopolies (Coman, 2004; Dragomir, 2021; Toma, 2019).

From a methodological perspective, the application of CR4 and HHI to television audience share data remains a robust approach for quantifying competition, especially in contexts where ownership data may be opaque. Scholars such as Albarran (2010) and Napoli (2008) have emphasized the value of these indicators in identifying structural trends in media markets. While some argue for more complex models incorporating qualitative content

analysis or network influence, these economic metrics remain essential tools for regulatory baseline assessments (Baker, 2007; D'Arma & Steemers, 2021).

Recent papers confirms that the dynamics observed in the Romanian television market are not isolated but part of broader regional trends. Studies of Central and Eastern Europe show that media systems in the region have developed along diverging paths, with some countries building stronger public service institutions while others remain marked by political parallelism and commercial dominance (Boshnakova, 2023). In Romania, these challenges are particularly visible, as weak regulatory safeguards and the erosion of public service broadcasting have created conditions for ownership concentration and political influence (Botan, 2024). The evidence presented in this study, showing the dominance of a few broadcasters, is consistent with this wider literature that links market consolidation to systemic vulnerabilities in post-communist democracies. By situating the Romanian case within this comparative framework, the results underline the importance of continuous monitoring and reform of media institutions at the national level.

Comparative research in Central and Eastern Europe highlights that Romania's television market exhibits patterns similar to those in other post-socialist states: a small number of commercial broadcasters dominate the market, public service media struggle to remain relevant, and regulatory bodies face capacity constraints (Balčytienė, 2012; Jakubowicz, 2007). In this context, a systematic concentration analysis is not only timely but also crucial for informing debates on media pluralism, democratic accountability, and cultural policy.

An important contribution from the Romanian academic context comes from Busu (2012), who offers a detailed economic analysis of market concentration using both structural and performance-based indicators. His work emphasizes the relevance of CR4 and HHI in diagnosing market power and assessing the degree of competition across various industries, including media. By focusing on the implications of concentration for regulatory decision-making, Busu provides a practical framework for applying economic theory to real-world market structures. His findings support the use of standardized competition indicators in the Romanian context, aligning well with the methodological foundation of the present study. Furthermore, Busu's empirical orientation underscores the value of accessible metrics in transitional economies, where regulatory institutions often face data and capacity constraints.

Recent articles have highlighted that audiences no longer consume media in a straightforward way but often navigate news with a generalised scepticism, especially when using digital and social platforms, which places additional pressure on traditional broadcasters to maintain credibility and ensure diversity in information supply (Fletcher & Nielsen, 2020). At the same time, studies on media pluralism stress that competition in the market is not the only factor to consider, since the presence or absence of democratic safeguards and effective regulation plays a decisive role in shaping whether concentration threatens diversity and the public interest (Trappel, 2020). Building on this perspective, cross-national research shows that ownership concentration in the media sector can have clear negative consequences for democracy, as it tends to reduce editorial diversity, weaken access to independent voices, and strengthen the influence of dominant groups over both political and economic life (Puppis & Maggetti, 2022).

Beyond the national and regional level, recent research has also emphasized that ownership concentration and market regulation must be analysed in a European and global context. The Euromedia Ownership Monitor has developed new multidimensional approaches to measuring media ownership, which show that market concentration and cross-ownership

remain a challenge across the continent (Tomaz, 2024). Scholars have argued that EU media policy should evolve toward stronger frameworks for pluralism, transparency, and public interest protections, as existing mechanisms have proven insufficient to counter consolidation (Holtz-Bacha, 2024). At the same time, the Romanian media sector faces additional pressures linked to disinformation and political influence, highlighting the need for resilience policies that address both structural concentration and informational quality (Durach, 2025). These risks are also reflected in empirical work showing that concentrated media environments tend to produce less diverse news coverage, as automated text analysis has revealed greater similarity of content in markets dominated by a few players (Hendrickx & Van Remoortere, 2022). Taken together, these insights reinforce the relevance of the present findings and show that the Romanian case is part of a wider debate on how to balance market forces, democratic safeguards, and media pluralism.

In summary, this review shows that existing scholarship supports the use of concentration indices as valid and meaningful tools for analyzing competition in the media sector. While most literature focuses on mature Western markets, there is growing attention to transitional media systems in Eastern Europe. This study contributes to this gap by applying established economic indicators to the Romanian television market, thereby offering empirical evidence for regulators, scholars, and stakeholders concerned with both market dynamics and media freedom.

Research Design, Methodology, Research Tasks and Hypothesis

The study uses quantitative tools rooted in industrial organization theory. These are applied to real-world data on audience shares in order to assess the level of market dominance among the largest broadcasters. The analysis also considers the implications for media pluralism and regulatory oversight.

The research adopts a descriptive and analytical design based on secondary data. Audience share figures serve as the main performance indicator because they directly influence advertising revenues and reflect consumer preferences. The sample includes the major national broadcasters operating in Romania during a recent period.

To measure market concentration, the study applies two widely used indicators: the Concentration Ratio (CR4) and the Herfindahl-Hirschman Index (HHI). Both are standard tools in antitrust analysis and competition studies.

- **CR4** measures the combined market share of the four largest firms. Values above 60% indicate high concentration; values between 40–60% suggest moderate concentration; and values below 40% signal a competitive market.
- **HHI** is calculated as the sum of squared market shares of all firms. It ranges from near zero (perfect competition) to 10,000 (pure monopoly). According to the U.S. Department of Justice and the European Commission, values below 1,500 indicate low concentration, 1,500–2,500 indicate moderate concentration, and above 2,500 indicate high concentration.

These indices are commonly used in antitrust analysis and economic competition literature to measure the degree to which market share is concentrated among a few dominant players.

The Concentration Ratio for the top 4 firms (CR4) is defined as:

$$CR_4 = S_1 + S_2 + S_3 + S_4 \tag{1}$$

where S1,S2,S3,S4 represent the market shares (expressed as percentages) of the four largest firms in the industry. The CR4 index ranges from 0 to 100, with values above 60 indicating a highly concentrated market, values between 40–60 indicating moderate concentration, and values below 40 reflecting a competitive market structure.

The **Herfindahl-Hirschman Index (HHI)** is calculated using the formula:

$$HHI = \Sigma(S_i^2) \tag{2}$$

where Si represents the market share (in percentage terms) of firm iii, and nnn is the total number of firms in the market. The index can range from near 0 (perfect competition) to 10,000 (pure monopoly). According to the U.S. Department of Justice and the European Commission:

Table 1. Market classification based on the HHI values

HHI Value Range	Market Classification
Below 1,500	Unconcentrated market
Between 1,500 and 2,500	Moderately concentrated market
Above 2,500	Highly concentrated market

Source: Department of Justice (DoJ) and Federal Trade Commission (FTC)

Audience share data were obtained from Kantar Media, a leading international audience measurement company, and from the Romanian Association for Audience Measurement (ARMA), the official national authority overseeing TV audience research. ARMA ensures methodological consistency and transparency in Romania's audience ratings, while Kantar Media provides the technical implementation of the measurement system. These institutions are widely recognized in both academic research and industry practice as reliable sources of audience data (ARMA, 2024; Kantar, 2023).

The research followed three main steps:

1. Identification of the main national broadcasters.
2. Collection of secondary data on audience shares for a representative period.
3. Calculation of CR4 and HHI to quantify market concentration.

The study is driven by the following research hypothesis:

H$_1$: *The Romanian television market is characterized by a moderate to high level of concentration, with a few dominant broadcasters accounting for a significant share of the total audience.*

This hypothesis is grounded in prior observations of market dynamics in Eastern Europe and preliminary reports on media ownership structures. Confirming or rejecting this hypothesis will offer insights into the current state of competition in the Romanian television market and help inform media regulators and scholars concerned with pluralism, consumer choice, and democratic discourse.

In conclusion, this methodological approach - anchored in established economic tools - provides a replicable and robust framework for evaluating media market concentration. The next chapter presents the empirical results based on these calculations.

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Research results and Discussion

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The findings from the analysis of the Romanian television market based on audience share data. The focus is on calculating the degree of market concentration using the Concentration Ratio for the top four players (CR4) and the Herfindahl-Hirschman Index (HHI). These results are interpreted in light of theoretical expectations and existing literature on media competition in transitional economies.

The table below shows the estimated market shares of major national television broadcasters in Romania, based on average daily audience share for a representative period (e.g., Q4 2024). Data has been collected from public sources and audience measurement reports provided by ARMA (Romanian Association for Measuring the Audiences).

<div align="center">

Figure 1. Market Shares of Major Romanian Television Broadcasters

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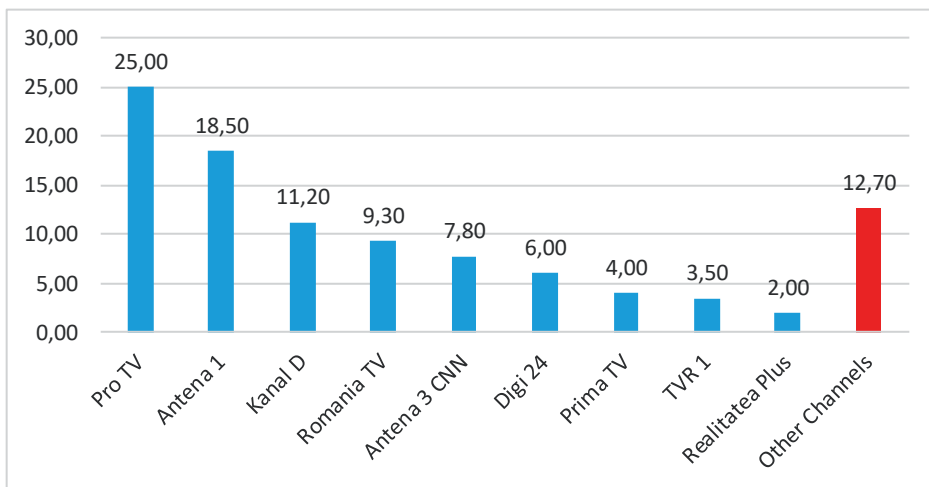
Source: ARMA, Quarterly Audience Report (Q4 2024)

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Based on the data above, we are able to calculate Concentration-Ratio for the top 4 companies (CR4) and the Herfindahl-Hirschman Index (HHI):

$CR_4 = 25.0 + 18.5 + 11.2 + 9.3 = 64.0\%$

The CR4 value of **64.0%** indicates a **highly concentrated** market, as it exceeds the 60% threshold commonly used in competition analysis.

$HHI = (25.0)^2 + (18.5)^2 + (11.2)^2 + (9.3)^2 + (7.8)^2 + (6.0)^2 + (4.0)^2 + (3.5)^2 + (2.0)^2 + (12.7)^2$

$HHI = 625.00 + 342.25 + 125.44 + 86.49 + 60.84 + 36.00 + 16.00 + 12.25 + 4.00 + 161.29 = 1469.56$

An HHI of 1,469.56 places the Romanian television market at the upper bound of an unconcentrated market, bordering on moderate concentration, according to U.S. DOJ and EU thresholds.

The CR4 result clearly signals a highly concentrated market structure dominated by four major broadcasters: Pro TV, Antena 1, Kanal D, and Romania TV. These players together

account for nearly two-thirds of total viewership, creating substantial barriers to entry for smaller or emerging channels. This dominance is reflected not only in audience size but also in advertising revenue, content acquisition, and political influence.

The HHI value, while below the 1,500 thresholds, suggests caution. When adjusted for the top four broadcasters alone, the partial HHI already exceeds 1,179, implying that the rest of the market is fragmented and unable to challenge the incumbents. The discrepancy between CR4 and HHI illustrates the limitations of relying on a single metric and highlights the importance of complementary indicators.

These findings are in line with previous analyses of post-communist media systems. Earlier studies have shown that weak regulatory frameworks and the limited role of public service broadcasting encouraged commercial actors to consolidate their market position (Jakubowicz, 2007; Dragomir, 2021). Our results support this observation by showing that market dominance in Romania is not temporary but has become a structural feature of the industry.

At the national level, similar patterns have been reported in earlier periods. Busu (2012), for example, found clear signs of market concentration in the Romanian media industry more than a decade ago, using both structural and performance-based indicators. The present analysis confirms that this trend has persisted, with concentration levels remaining high despite the growth of new channels and the spread of digital alternatives.

Comparisons with other countries in the region also reveal parallels. Research on Central and Eastern Europe has highlighted that a small number of commercial broadcasters dominate most markets, while public service media often struggle to maintain relevance (Balčytienė, 2012). Romania fits this broader pattern, showing that media consolidation is not only a local phenomenon but part of a wider regional trajectory.

On a global scale, the Romanian case is consistent with findings from Western democracies, where deregulation and liberalization did not necessarily increase pluralism. Studies by Picard (2002) and Noam (2009) demonstrate that even in mature markets, concentration remains a persistent feature of the television industry. More recent cross-national research further confirms that high ownership concentration reduces editorial diversity and may weaken democratic processes (Puppis & Maggetti, 2022).

Taken together, these comparisons emphasize the relevance of the current findings. The Romanian television market demonstrates the same structural risks identified in both regional and global studies: dominance by a few powerful broadcasters, reduced competition for smaller players, and potential threats to media pluralism. By situating the Romanian case within these broader trends, the results highlight the importance of regular monitoring and the adoption of policies aimed at maintaining diversity in the audiovisual sector.

Conclusion

This study examined the competitive dynamics of the Romanian television market by using two established measures of concentration: the Concentration Ratio and the Herfindahl-Hirschman Index. Audience share data served as the basis for the analysis and offered a clear picture of how market power is distributed among broadcasters.

The results show that a small group of television channels holds a dominant position, while the rest of the market remains fragmented. This imbalance gives the leading broadcasters

significant control over audiences and advertising revenues, shaping both the economic and cultural dimensions of the sector. Even though smaller players exist, they lack the influence to challenge the established leaders.

These findings confirm patterns already observed in other post-communist countries. In the Romanian case, weak regulation and the decline of public service broadcasting have allowed commercial actors to strengthen their positions. This situation raises concerns about media pluralism and the diversity of viewpoints available to the public.

The use of the two concentration indicators has proven effective in describing the structure of the market. At the same time, these measures cannot capture aspects such as ownership links, political influence, or the independence of editorial content. These factors remain critical for understanding the real impact of concentration in the media.

Several policy directions emerge from this study. Regulators should monitor market concentration on a regular basis and ensure that the results are made public. Conditions should be improved for smaller and independent broadcasters so that they can remain competitive and contribute to media diversity. Rules on cross-media ownership should also be strengthened, and public service broadcasting should be revitalized to provide a credible alternative to commercial players.

The study also has limitations. It relies only on audience data from a single period and does not include ownership structures, cross-media relations, or a deeper look at content diversity. Future research could build on this work by using longer time spans, adding qualitative indicators, and comparing the Romanian case with other countries in the region.

In conclusion, the Romanian television market is clearly shaped by the dominance of a few powerful broadcasters. This study provides an accessible method for examining that dominance and highlights its broader consequences for competition, policy, and democratic communication. By drawing attention to these issues, it supports ongoing debates about how to ensure a more open and pluralistic media system.

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ANALYSIS OF FISCAL AND MONETARY POLICY MEASURES - MITIGATE THE EFFECTS OF THE COVID-19 PANDEMIC IN THE SERBIAN ORGANIZATIONS

Abstract

Purpose: This study analyzes the fiscal and monetary policy measures implemented by the Republic of Serbia to mitigate the economic effects of the COVID-19 pandemic. This study evaluated their effectiveness in preserving economic stability, employment, and financial liquidity. This study employs a comparative analysis of fiscal and monetary policies using official data from the National Bank of Serbia and Ministry of Finance. A qualitative assessment of policy efficiency was performed along with an evaluation of their macroeconomic impact. This study finds that government interventions, including wage subsidies, tax relief, and monetary easing, play a crucial role in maintaining economic stability. While fiscal stimuli support short-term economic recovery, increased public debt poses long-term sustainability challenges. These findings highlight the importance of well-coordinated fiscal and monetary policies during an economic crisis. This study provides insights into policy effectiveness and offers guidance for future crisis management and financial stabilization strategies. This study contributes to the understanding of the role of policy responses in small economies during global crises. It provides a case study of Serbia, illustrating key takeaways applicable to similar economies that face economic shocks.

Key words: Fiscal policy, Monetary policy, COVID-19, Economic stability, Public debt, Serbia

JEL classification: E52, E58, E62, E63

АНАЛИЗА МЕРА ФИСКАЛНЕ И МОНЕТАРНЕ ПОЛИТИКЕ - СУЗБИЈАЊЕ ПОСЛЕДИЦА ВИРУСА COVID-19 У СРПСКИМ ОРГАНИЗАЦИЈАМА

Apstrakt

Ovaj rad ima za cilj analizu fiskalnih i monetarnih mera koje je Republika Srbija sprovela kako bi ublažila ekonomske posledice pandemije COVID-19. Studija

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procenjuje njihovu efikasnost u očuvanju ekonomske stabilnosti, zaposlenosti i finansijske likvidnosti. Istraživanje koristi komparativnu analizu fiskalne i monetarne politike, oslanjajući se na zvanične podatke Narodne banke Srbije i Ministarstva finansija. Kvalitativna procena efikasnosti mera je sprovedena zajedno sa analizom njihovog makroekonomskog uticaja. Studija pokazuje da su državne intervencije, uključujući subvencije za plate, poreske olakšice i monetarne podsticaje, imale ključnu ulogu u održavanju ekonomske stabilnosti. Dok su fiskalni stimulansi podržali kratkoročni ekonomski oporavak, povećanje javnog duga predstavlja izazov za dugoročnu održivost. Nalazi istraživanja ističu značaj dobro koordinisane fiskalne i monetarne politike tokom ekonomskih kriza. Studija pruža uvide u efikasnost donetih mera, nudeći smernice za buduće upravljanje kriznim situacijama i strategije finansijske stabilizacije. Ovo istraživanje doprinosi razumevanju uloge ekonomskih politika u malim ekonomijama tokom globalnih kriza. Pruža studiju slučaja Srbije, ističući ključne zaključke primenljive na slične ekonomije suočene sa ekonomskim šokovima.

Ključne reči: *Fiskalna politika, Monetarna politika, COVID-19, Ekonomska stabilnost, Javni dug, Srbija*

Introduction

The most important shift in the global world order was impacted by the Covid-19 virus. National economies were destabilized, financial capital markets were unstable, and the global economy was unstable. The social aspect of mankind, the global economy, and the potential for effective risk management have all been shattered by the fear of sickness. The financial markets and financial management have been subjected to extreme strain. As an economic sector, tourism has also been severely impacted by the virus, which has decreased travel, supply chains, endangered catering operations, decreased consumption and output, increased the negative effects on business, and prioritized safety. Additionally, the epidemic increased financial stress, which was mirrored in the costs of fossil fuels, renewable energy sources, and all other items. In the context of the COVID-19 pandemic, Chang and colleagues (2020) examined financial management risks in the domains of business, economics, and finance. Organizations, like humans, were compelled to adjust their operations as much as possible to the new circumstances in order to survive the crisis.

Negative responses to natural calamities and the invasiveness of viruses did not spare the markets. The global crisis that occurred five years ago served as a warning to investors and managers who are crucial to making strategically significant decisions, as well as to the entire human society, about the potential for significant economic harm and the harm that health factors can do to human lives (Goodell, 2020). According to medical perspective, a single "small virus" on the boundary between living and non-living organisms (since it only requires domestic oxygen for survival) caused confusion in all areas of human life and work, destroying the might of "strong" men and restoring nature's equilibrium (Ilic & Djukic, 2022). Even while the virus had a greater impact

on some facets of human society than others, its powerful impact was most noticeable in domestic consumption when seen internationally. According to Lagoarde-Segot and Leoni (2013), the authors' theoretical model demonstrated that the likelihood of the banking system in industrialized nations collapsing rises with the frequency of big pandemics; in other words, this risk affects banks' optimal reserves (Lagoarde-Segot & Leoni, 2013). It has been demonstrated that nations with stronger institutions, more advanced medical technology, and qualified professionals were unable to effectively combat the COVID-19 pandemic.

According to Petrović et al. (2020), systemic readiness did not equate to a good reaction mechanism to the viral outbreak. Priority and importance were given to government and government-affiliated programs (Ilic et al., 2023). Some authors contend that less developed countries fared better at the onset of the epidemic since there were less health interventions available for general preventative measures because there were no medications at the time and a shortage of vaccines (Adžić et al., 2022). The main defenses were reduced to imposing quarantine and limiting travel, which meant minimizing social contact. Maintaining personal hygiene and cleaning protective gear were also given careful consideration (Mijović, 2020). It can be concluded that the country's "readiness" in the health system was essential to its survival, while the financial system reflected business readiness, which in turn was essential to the social system's survival and, more importantly, its sustainability. Businesses have never been more socially conscious, particularly when it comes to safeguarding the health of their employees.

In an effort to boost sales, businesses have shifted toward new inventions and technology, depending more and more on new forms of communication (Ilić & Ostojić, 2023). In every region of the nation, the idea of sustainable development has taken center stage and become essential to human civilization on a local and global level (Stojanović et al., 2017).

In early March 2020, the first case of coronavirus disease (COVID-19) was reported in the Republic of Serbia. Shortly thereafter, a state of emergency was declared accompanied by a series of measures aimed at protecting public health. The actions taken had a significant impact on economic activities and limited business in most industries, putting in the center the trends of human resource protection (Krušković et al., 2023). To mitigate the adverse effects of the pandemic on the economy, the National Bank of Serbia and Government of the Republic of Serbia introduced a set of appropriate measures. This study conducts a comparative analysis of the fiscal and monetary policies implemented and their impacts on Serbia's economy. To thoroughly examine these issues, it is essential to briefly define public finance, its role in economic stability, and its two main components—fiscal and monetary policy.

Public finance is a critical segment of economic science that focuses on government revenues and expenditures and their effects on the economy. It encompasses financial activities, such as tax collection, public spending, and public debt management. Public finance plays a key role in economic stabilization, income redistribution, and the provision of public goods and services that the private sector cannot deliver efficiently.

Fiscal policy involves government decisions regarding public revenue and expenditure. It serves as a tool to achieve macroeconomic goals such as economic stability, growth, and reduced unemployment. Fiscal policy can be expansionary,

involving increased public spending and/or reduced taxes to stimulate economic activity, or restrictive, characterized by reduced spending and/or higher taxes to control inflation and decrease budget deficits (Baumol & Blinder, 2016).

Monetary policy, on the other hand, is the management of money supply and interest rates conducted by the central bank to maintain price stability and support economic growth. Its key instruments include open-market operations, benchmark interest rates, and reserve requirements. Similar to fiscal policy, monetary policy can be expansionary, with reduced interest rates and increased money supply to stimulate the economy, or restrictive, with the aim of controlling inflation through higher interest rates and reduced money supply (Mishkin, 2019).

Fiscal and Monetary Policy in the Republic of Serbia

The role of fiscal and monetary policies in public finance is crucial for achieving any country's macroeconomic goals. Understanding their functioning and interaction provides the foundation for analyzing economic policies and making informed decisions that contribute to economic development and stability.

In recent years, fiscal policy in the Republic of Serbia has been directed toward achieving fiscal consolidation and stabilizing public finances. Following the 2008 global economic crisis, Serbia faced significant challenges including high budget deficits and rising public debt. In response to these challenges, the Serbian government implemented a series of reforms aimed at reducing budget deficits, including public sector wage cuts, pension system reforms, and tax increases (Ministry of Finance of the Republic of Serbia, 2021).

Since 2015, Serbia has made significant progress in fiscal consolidation, resulting in reduced budget deficits and stabilized public debt. These measures have improved the country's credit rating and increased investor confidence. However, the COVID-19 pandemic has posed new challenges, necessitating additional fiscal interventions to support the economy and preserve jobs (Fiscal Council of the Republic of Serbia, 2020).

However, monetary policy in the Republic of Serbia is implemented by the National Bank of Serbia (NBS), which focuses on maintaining price stability and supporting economic activity. The NBS employs various monetary policy instruments, including open market operations, adjustments to the benchmark interest rate, and mandatory reserves to influence the banking system liquidity and interest rates.

Over the past decade, the National Bank of Serbia has successfully maintained relatively low and stable inflation rates, which is a key goal of monetary policy. Additionally, in response to the economic crisis caused by the COVID-19 pandemic, the National Bank of Serbia reduced the benchmark interest rate and implemented measures to ensure liquidity in the financial system to support the economy and maintain banking sector stability (National Bank of Serbia, 2020).

The following graph illustrates how the budget deficit surged in 2020 owing to increased expenditures and reduced revenues caused by the pandemic. Public debt also increased as a result of higher borrowing to finance support measures.

Graph 1. Trends in Budget Deficit and Public Debt
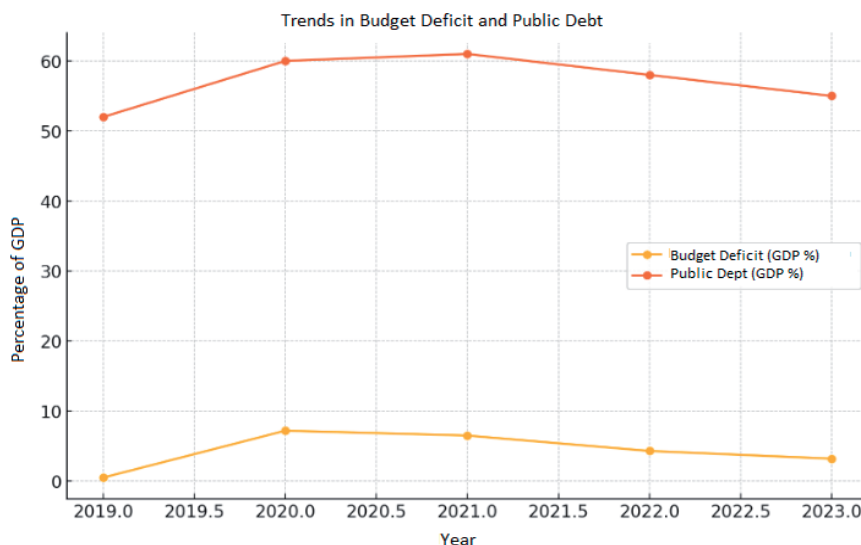
Source: Ministry of Finance of the Republic of Serbia, National Bank of Serbia

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Negative Effects of the COVID-19 Pandemic in the Republic of Serbia

The COVID-19 pandemic has had significant negative impacts on the economy of the Republic of Serbia, affecting various sectors and causing numerous economic and social problems. The key sectors that experienced the greatest losses include tourism, hospitality, retail, manufacturing, and transportation.

• **Tourism and Hospitality:** Tourism and hospitality were among the hardest-hit sectors. Border closures, travel restrictions, and reduced consumer spending have led to a drastic decline in tourist numbers and revenues in these sectors. Many travel agencies, hotels, restaurants, and other hospitality establishments face revenue losses or complete shutdowns, resulting in job losses and reduced employment in these industries (Ministry of Trade, Tourism, and Telecommunications, 2021).

• **Retail and Manufacturing:** Retail experienced significant declines due to reduced consumer demand and restrictive measures aimed at curbing the spread of the virus. The closure of shopping centers, stores, and markets affected the revenues of traders and manufacturers, while supply chain disruptions added further challenges. The manufacturing sector has faced issues such as reduced production, raw material shortages, and decreased exports (Chamber of Commerce and Industry of Serbia, 2020).

• **Transportation:** The transportation sector also suffered severe losses due to reduced population mobility and declining international transport activity. Airlines, railways, bus operators, and transport companies face reductions in passenger numbers and cargo volumes, leading to revenue losses and increased costs (Ministry of Construction, Transport and Infrastructure, 2021).

In addition to the aforementioned issues and consequences affecting key sectors in Serbia, the pandemic exposed and exacerbated several critical problems and risks that had a direct impact on the entire economy. These problems primarily affected unemployment and social insecurity, public debt and budget deficits, the healthcare system, and education.

• **Unemployment and Social Insecurity:** Reduced economic activity led to increased unemployment and decreased household incomes, further heightening social insecurity and poverty. The COVID-19 pandemic has caused significant increases in unemployment in Serbia. Owing to restrictive measures and reduced economic activity, many companies were forced to lay off workers or close their businesses entirely. The most affected sectors included tourism, hospitality, retail, and transportation, leaving a large number of workers unemployed. Increased unemployment further worsened social insecurity, particularly for vulnerable groups such as young people, women, and low-skilled workers (World Bank, 2021).

• **Public Debt and Budget Deficits:** To mitigate the negative economic effects of the pandemic, the Government of the Republic of Serbia implemented a series of fiscal measures, including subsidies, direct support to businesses and citizens, and increased public spending on the healthcare sector. These measures significantly increased the country's budget deficit and public debt. According to the Ministry of Finance, Serbia's public debt rose from 52% of GDP before the pandemic to over 60% of GDP during 2020. The increase in public debt could hinder fiscal stability in the long term and reduce the fiscal space for future investments and economic growth (Ministry of Finance of the Republic of Serbia, 2020).

• **Healthcare System:** The COVID-19 pandemic has placed immense pressure on Serbia's healthcare system. Hospitals faced capacity shortages, a lack of medical equipment, and insufficient personnel, making it difficult to provide adequate healthcare for COVID-19 patients and those with other medical needs. Additionally, the pandemic revealed structural weaknesses in the healthcare system, including insufficient investment in infrastructure, technology, and workforce training. These issues highlighted the need for urgent improvements to make the healthcare system more resilient to future crises (Institute of Public Health of Serbia, 2021).

• **Education Sector:** The closure of schools and the transition to online learning posed significant challenges for Serbia's education system. Many students, particularly those from rural areas and low-income families, lacked access to the necessary technological resources for online learning, increasing educational inequalities. Furthermore, the lack of interaction between students and teachers and the absence of practical learning negatively affected the quality of education. These issues underscored the need for improving digital infrastructure and ensuring equal access to education for all students (UNICEF Serbia, 2020).

The observed negative effects and challenges highlight the need to strengthen the economy and society's resilience to crises, improve the healthcare system, diversify the

economy, and enhance social protection. Appropriate measures were needed to mitigate the pandemic's negative impacts in response to the emerging crisis.

Implemented Monetary and Fiscal Policy Measures

The negative consequences of the COVID-19 pandemic created severe economic challenges in the Republic of Serbia, necessitating urgent and comprehensive monetary and fiscal policy measures. The goal of these measures was to stabilize the economy, protect jobs, and support the healthcare system. The Government of the Republic of Serbia, together with the National Bank of Serbia, implemented a series of fiscal and monetary measures to support the economy and mitigate the negative effects of the pandemic.

Key Fiscal Measures
• **Direct Support to Businesses and Citizens:** The government introduced direct support programs to mitigate the economic consequences of the pandemic. These measures are aimed to preserve jobs and increase the purchasing power of the population and include the following:
o **Wage Subsidies:** The Government of Serbia provided payments equivalent to the minimum wage for private sector employees over three months (April, May, and June 2020). This measure directly contributed to reducing layoffs and increasing employee security. The cost of this measure amounted to approximately 3% of the GDP.
o **One-Time Payments to Citizens:** All adult citizens received one-time financial assistance of 100 euros (in dinar equivalents) in May and June 2020. The estimated cost of this measure was approximately 1% of the GDP.
o **Support for Small and Medium Enterprises (SMEs):** The SME sector was granted non-repayable subsidies and favorable loans to ease operations and maintain liquidity. Programs of non-repayable subsidies and favorable loans for SMEs contributed to maintaining liquidity and business activity. The cost of these programs is estimated to be approximately 2% of the GDP.
o **Tax Reliefs and Deferrals:** Businesses were provided with relief in the form of deferred payment of taxes and contributions, as well as temporary exemption from certain fiscal obligations, to reduce liquidity pressures. The deferral of income tax and social security contributions helped preserve liquidity and business continuity, while temporary tax exemptions most benefited sectors such as hospitality and tourism, significantly alleviating the negative effects of the pandemic on these sectors. The cost of deferrals and exemptions is estimated to be around 1.5% of GDP, with most funds planned for collection in subsequent years. Exemptions for the most affected sectors reduced fiscal revenue by approximately 0.5% of GDP but significantly helped sustain operations in these sectors.
• **Increased Public Investments:** The government increased public investments in the healthcare sector, prioritizing the procurement of medical equipment, construction of new hospitals, and expansion of existing healthcare facilities. Additional funds

were allocated to healthcare worker salaries and other costs related to the fight against COVID-19. Increased investments in healthcare infrastructure and equipment had a direct positive impact on the capacity of the healthcare system to respond to the pandemic. The total cost of these investments is estimated to be approximately 2% of GDP. Additionally, investments in infrastructure were increased to stimulate economic growth. These investments included road construction, railways, and energy facilities, aimed at boosting economic activity and creating new jobs. Public infrastructure investments have contributed to job creation and economic growth. The cost of these projects is estimated to be approximately 1% of the GDP.

• **Financial Support for the Most Vulnerable:** Programs of social assistance were introduced for the most vulnerable groups, including additional support for pensioners and socially disadvantaged citizens. Pensioners received one-time bonuses, and regular pensions for the most vulnerable categories were increased. This measure helped maintain the standard of living for pensioners, with a cost estimated at around 0.5% of the GDP. Additionally, social assistance programs were expanded to cover all citizens in need of support during the pandemic. The expansion of social assistance programs positively impacted the most vulnerable population groups, with a total cost of around 0.5% of the GDP.

The fiscal measures taken by the Republic of Serbia include direct support to citizens and businesses, tax relief, and investments in the healthcare sector. According to Ministry of Finance estimates, the total value of these measures amounted to 608.3 billion dinars, representing approximately 11% of the gross domestic product (GDP). Of this, 28.4 billion dinars (0.5% of GDP) were invested in the healthcare sector, while 161 billion dinars (2.9% of GDP) were allocated for direct support to citizens and small and medium enterprises. Tax relief and direct payments amounted to 68 billion dinars (1.2% of GDP), while liquidity measures for businesses amounted to 264 billion dinars (4.8% of GDP). Other measures accounted for 86 billion dinars (1.6% of GDP) (Ministry of Finance of the Republic of Serbia, 2021).

Graph 2. Costs of Fiscal Policy Measures as a Percentage of GDP
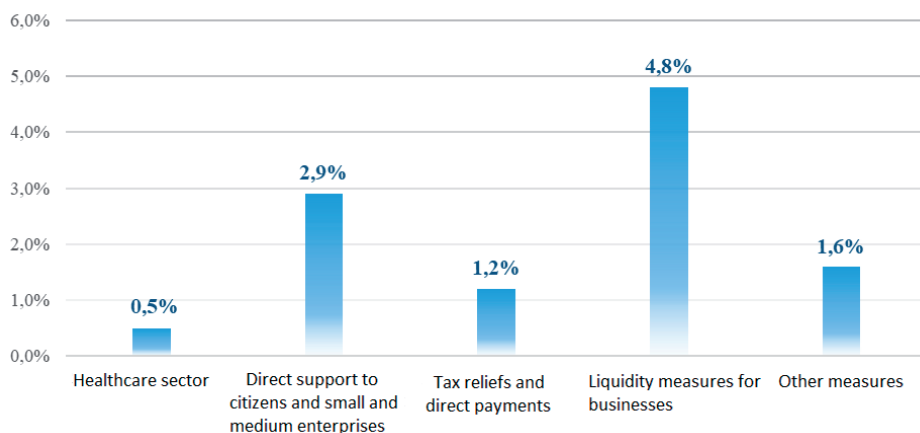
Source: Ministry of Finance of the Republic of Serbia

In addition to the fiscal measures undertaken by the Government of the Republic of Serbia, the National Bank of Serbia (NBS) also implemented a series of monetary measures to support economic recovery and maintain financial stability.

Key Monetary Measures

• **Reduction of the Benchmark Interest Rate:** The National Bank of Serbia reduced the benchmark interest rate to a historically low level, from 2.25% to 1.0% in 2020. These measures aimed to lower borrowing costs for businesses and households, stimulate credit activity, and support liquidity in the financial system. While the effects of this measure are difficult to quantify in terms of GDP percentage, they significantly contributed to the recovery of the economy.

• **Open Market Operations:** The National Bank of Serbia conducted open market operations, including the purchase of government bonds in the secondary market, to increase bank liquidity, reduce interest rates, and support the stability of the financial system. The cost of open-market operations is estimated to be approximately 2% of the GDP. Additionally, the NBS temporarily repurchased securities from banks with an obligation to repurchase them, thereby increasing the short-term liquidity in the banking sector. The effects of these operations are estimated at approximately 1% of GDP.

• **Credit Facilitation Measures:** To ease credit availability for businesses and households, the National Bank of Serbia introduced a reduction in mandatory reserves that banks are required to hold with the central bank, thereby freeing up additional funds for lending. Although the cost of this measure is difficult to quantify precisely, it contributed to increased credit activity. Additionally, government-backed guarantee programs for loans to businesses, particularly small and medium enterprises (SMEs), were introduced to reduce risks for banks and facilitate loan approvals. The total cost of guarantee programs is estimated to be approximately 1% of the GDP.

• **Exchange Rate Stabilization:** The National Bank of Serbia implemented measures to stabilize the exchange rate, including interventions in the foreign exchange market to maintain investor confidence and prevent excessive dinar volatility. Exchange rate stabilization was achieved through foreign exchange market interventions by buying and selling foreign currencies to stabilize the dinar's value, thereby maintaining the financial system's stability. The cost of foreign exchange market interventions for exchange rate stabilization is estimated to be approximately 1% of the GDP.

The total monetary measures undertaken during the pandemic are estimated to be approximately 5% of GDP (National Bank of Serbia, 2020).

Fiscal and monetary measures significantly contributed to stabilizing the economy and mitigating the negative effects of the pandemic. The total fiscal measures are estimated at around 11% of GDP, while monetary measures account for approximately 5% of GDP. Combined, these measures represented about 16% of the GDP, showcasing a substantial effort by the state to address the economic crisis caused by the pandemic (Ministry of Finance of the Republic of Serbia, 2021; National Bank of Serbia, 2020).

Graph 3. Comparison of Fiscal and Monetary Measures as a Percentage of GDP
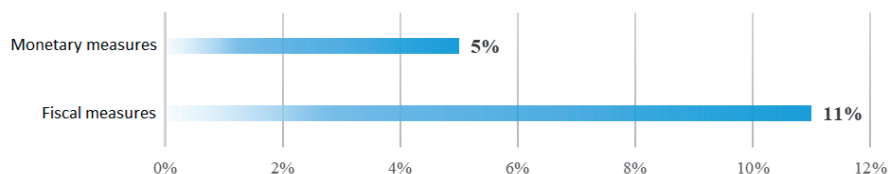
Source: Ministry of Finance of the Republic of Serbia, National Bank of Serbia

Fiscal and monetary measures significantly contributed to stabilizing the economy and mitigating the negative effects of the pandemic. However, the increase in budget deficit and public debt presents a long-term challenge to the country's fiscal stability. During the pandemic, Serbia's budget deficit rose from 1.8% of its GDP in 2019 to approximately 8% of its GDP in 2020 (Ministry of Finance of the Republic of Serbia, 2021).

Serbia's public debt increased from 52.0% of GDP by the end of 2019 to approximately 57.4% of GDP by the end of 2020, which represents a significant increase but remains below the Maastricht criterion of 60% of GDP (Ministry of Finance of the Republic of Serbia, 2021). These changes highlight the need for careful fiscal policy planning in the coming years to ensure the long-term sustainability of public finance.

Conclusion

The COVID-19 pandemic represented one of the most significant challenges for the global economy in recent decades, and the Republic of Serbia was no exception. The economic and health impacts of the pandemic necessitated urgent and extensive fiscal and monetary policy measures to mitigate its negative effects. Serbia responded with a comprehensive package of measures aimed at preserving jobs, supporting the economy, stabilizing the financial system, and protecting the most vulnerable groups.

Some of the implemented measures proved effective and yielded significant results. These included wage subsidies and one-time payments to citizens, which were key to preserving jobs and boosting the aggregate demand. Wage subsidies directly prevented mass layoffs and helped businesses survive the crisis. One-time payments to citizens stimulated consumption, thus benefiting the retail sector. Additionally, support for small and medium enterprises (SMEs) through grants and favorable loans enabled businesses to maintain liquidity and continue operations, preventing bankruptcy. Investments in the healthcare sector increased the capacity of the healthcare system, facilitated the procurement of medical equipment, and allowed for a better response to the pandemic, reducing pressure on hospitals and healthcare workers.

Regarding monetary measures, the reduction of the benchmark interest rate yielded positive results, encouraging credit activity and reducing borrowing costs, which supported the liquidity of businesses and households. Increased credit availability helped enterprises navigate crises. Significant results were also achieved through open-market operations, where the purchase of government bonds and repo operations

provided additional liquidity to banks, enabling them to continue lending to businesses and households under favorable conditions. Furthermore, guarantee programs for loans reduced banks' risks and facilitated loan approvals for SMEs, helping maintain business activity and liquidity.

However, not all the measures yielded equally significant results. For example, tax reliefs and deferrals, although reducing financial pressure on businesses, had limited effectiveness because of the uncertainty of the crisis duration and the need for long-term solutions. Deferred taxes had to be paid later, creating additional pressure on businesses when economic activities recovered. Temporary tax exemptions for the most affected sectors provided limited relief because of their narrow scope, leaving some industries unaddressed. Exchange rate stabilization measures aimed at supporting dinar's stability were costly and could not completely prevent volatility caused by global economic disruptions. Pressure on foreign exchange reserves increased the risk of long-term stability.

The implemented fiscal and monetary measures had a significant positive effect on mitigating the negative consequences of the pandemic, preserving jobs, supporting the economy, and stabilizing the financial system. However, these measures led to an increase in budget deficit and public debt, posing a long-term challenge to the country's fiscal stability. In the future, careful fiscal policy planning and structural reforms will be necessary to ensure the sustainability of public finances and to support economic growth. The success in preserving jobs, increasing liquidity, and supporting the most vulnerable groups demonstrates the effectiveness of the measures in addressing the crisis. However, the need for further adjustments and additional reforms remains crucial to ensuring long-term economic recovery and stability through careful fiscal policy planning, supporting private sector innovation, and strengthening healthcare and social protection systems.

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ШАБЛОН / ТЕМПЛАТЕ ЗА ПИСАЊЕ РАДОВА

Име аутора (Font size 10 Normal) Times New Roman (SR-Cyrilic)
Факултет или институција и Град (Font size 10 Italic)

НАСЛОВ СРПСКИ (Font size 11 Bold)

Апстракт

Текст апстракта на српском ...

Кључне речи:

NASLOV ENGLESKI ili neki drugi jezik (Font size 11 Bold)

Abstract

Tekst apstrakta na engleskom ili na nekom drugom jeziku...

Key words:

НАСЛОВ (Font size 11 Bold)

Текст (Font size 10)……...

Литература

1.   Списиак литературе

Veličina strane 170mm x 240mm
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