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Original Scientific Paper

MILLENNIALS IN THE CREATION OF SOCIAL VALUE OF THE ENTERPRISE

UDC 005.35

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Abstract. *The article emphasizes the creative activity that underlies the concept of "social value", which forms in the course of solving actual social problems. Social responsibility is mainly determined by reducing the negative impact of business on the basis of support and development of innovative projects. An analytical comparison of the categories of "social value" and "social responsibility" with the Sustainable Development Goals revealed a greater correspondence of the concept of "social value" to the sustainable development strategy. A statistical study of data from European countries allowed to draw a conclusion about the increase in social value in consumption, recycling of production resources, the use of renewable energy sources, and the growth of preferences for the development of own business. Based on the conducted research, the article highlights the exceptional role of millennials in updating the issues of social focus of business.*

Key words: *social responsibility, social value, sustainable development strategy, Gen Y.*

JEL Classification: M140

INTRODUCTION

In Deloitte's 2019 Global Human Capital Trends Report, 44% of business and HR executives surveyed said social entrepreneurship issues are more important to their organizations than they were three years ago, and 56% expect them to become even more important in three years (Deloitte, 2020). In Deloitte's 2019 Global Cxos survey, 73% said their organizations had changed or developed products or services in the past year to make a positive impact on society (Deloitte, 2020).

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The research results show the increasing relevance of the issues of social influence of business. If we consider the impact of the activities of enterprises on society, it is worth paying special attention to the study of the essence of the concepts of "social responsibility" and "social value".

Questions of social focus of business are interesting not only for entrepreneurs, but also for scientists. For example, recent research has identified a U-shaped relationship between an entrepreneur's age and their willingness to create social value (Brieger et al, 2020). According to the researchers, the emphasis on creating social values decreases with increasing age throughout early middle age, during which entrepreneurs are more likely to prioritize personal values. However, the age factor can be considered as one of the determinants motivating the creation of social value. Thus, a more detailed study of the social identity of the main stakeholders of the social orientation of business is of scientific interest.

As part of the study, a literature review of publications related to the social identity of millennial, the concepts of "social responsibility" and "social value" was conducted. Based on the literature review, scientific hypotheses were put forward, the verification of which was described in the results. At the end of the study, the conclusions obtained as a result of studying the problems of social orientation of business are presented.

Literature Review and Hypothesis Development

Recent studies demonstrate that individuals enjoy the pursuit of specific brands to express their sense of belonging to a social group or status (Helal & Ozuem, 2019; Aaker, 2004; Adjei et al, 2009; Algesheimer et al, 2005, Tsimonis & Dimitriadis, 2014). The point of discussion is the direction of mutual influence of brand demand and belonging to a social group (Brickson, 2007; Gielnik et al, 2012; Kanfer & Ackerman, 2004; Kautonen et al, 2011). Perhaps it is belonging to a social group that determines the demand for specific brands. Researchers claim that millennial influence should be reflected in organizations' strategic plans, brand messaging, and stakeholder networks (Maiers, 2017; Acs et al, 2013; Athayde, 2009). Agreeing with this statement, we note that it is worth delving into the advantages of such a strategy. The influence of Gen Z is expanding, but what is the social influence of representatives of this generation (Francis & Hoefel, 2020).

Recent studies point different features of millennials, such as thinking complexly (Afifah, 2020), extraordinary thinking abilities (Yusri, 2020), idealistic, altruistic generation (Gay, 2017), collaborative, accessible, responsible (Haber, 2016), looking for employers with CSR values (PwC, 2020), impacted by internet influencers (Loeb, 2020). At the same time, it is advisable to systematize scientific developments in order to more fully reveal the social influence of Generation Y.

Recent research shows dramatic shifts in youth behaviors, attitudes and lifestyles (Dimock, 2019). It is the issue whether entrepreneurs' individual resources influence their willingness to create social value and to meet principles of sustainable development (Brieger& De Clercq, 2019; Carsrud & Brännback, 2011; Cohen et al, 2008; Hörisch et al, 2017; Hörisch et al, 2019; Kautonen et al, 2014; Wiernik et al, 2013) and what are the causes of social tensions inside the countries (Gontareva et al, 2021; De Clercq et al, 2013; Estrin et al, 2013; Estrin et al, 2016).

Thus, we summarized our thoughts in the following hypotheses:

Hypothesis 1: "Social value" in a conceptual comparison with the concept of "social responsibility", which previously was the base for progressive corporate strategies, demonstrates greater compliance with the current principles of sustainable development.

Hypothesis 2: The most motivated actors in creating social value for businesses are Gen Y (millennials) social and entrepreneurial identities.

The purpose of the research is to test hypotheses theoretically and practically, to define the social aspects of entrepreneurship, to determine the correspondence of the social and environmental principles of modern business, to identify the key actors in the formation and promotion of the social value of entrepreneurship.

To achieve the goal of the study, comparison, generalization, analysis, synthesis, deduction, induction, as well as statistical analysis were used.

RESULTS

First, the existing approaches to determining the social responsibility of the enterprise were studied. The main definitions of the categories "social responsibility" and "social value" are presented in Tables 1 and 2 accordingly.

Table 1 Definition of the category "social responsibility"

Source	Definition
Investopedia	“Social responsibility means that a business, in addition to maximizing shareholder value, must act in a way that benefits society. However, critics argue that the basic nature of business does not view society as an interested party” (Ganty, 2020).
American Society for Q uality (ASQ)	“Social responsibility is a means to achieve sustainability. Adopting key principles of social responsibility, such as accountability and transparency, can help ensure the long-term viability and success of any organization or system” (American Society for Quality, 2020).
United Nations Industrial Development Organisation (UNIDO)	“Corporate social responsibility is a management concept in which companies integrate social and environmental concerns into their business operations and interactions with their stakeholders” (United Nations Industrial Development Organisation, 2020).
Business News Daily	“Corporate social responsibility (CSR) is a type of self - regulation of a business to ensure social responsibility; many corporate CSR initiatives seek to make a positive contribution to society, the economy, or the environment” (Schooley, 2020)

Source: built by author based on Ganty, 2020, American Society for Quality, 2020, United Nations Industrial Development Organisation, 2020, Schooley, 2020

Table 2 Definition of the category "social value"

Organization	Definition
Bristol City Council	"Social value is about maximizing the impact of public expenditure to get the best possible outcomes, and recognizing that local people are central to determining how these can be achieved".
BusinessDictionary.com	"Social value is larger concept which includes social capital as well as the subjective aspects of the citizens' well-being, such as their ability to participate in making decisions that affect them".
Kirklees Council	"If £1 is spent on delivery of services, can that same £1 be used to also produce a wider benefit to the community?"
National Association of Certified Valuation Analysts (NACVA)	"Social value is about maximizing the impact of public expenditure. It looks at what is created, and sometimes what is forsaken, through a commissioning process".
Social Value Hub	"Social value is the benefit to the community from a commissioning/procurement process over and above the direct purchasing of goods, services and outcomes".
Sustainable Procurement Task Force 2006	"Social value is a process whereby organizations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits to society and the economy, whilst minimizing damage to the environment".
The Public Services (Social Value) Act 2012	"Social value seeks to maximize the additional benefit that can be created by procuring or commissioning services, above and beyond the benefit of merely the services themselves".

Source: UK Green Building Council, 2018

Based on tables 1 and 2, the categories "social responsibility" and "social value" were compared according to the criteria of key areas of activity, areas of influence and stakeholders. The results are presented in table 3.

Table 3 Comparison of the categories "social responsibility" and "social value"

Comparison criteria	Social responsibility	Social value
Key areas of activity	Innovative technologies Green energy	Solving urgent social problems
Key impact	Harm reduction, correction of influence	Creating positive external effects
Key actors	Medium and large businesses, global corporations	Microenterprises Startups
Stakeholders	Government, business	Vulnerable social groups Territorial communities

Source: built by author based on Hopkins, 2006

Further research is aimed at studying the correspondence of the concept of "social responsibility" and "social value" to the main goals of sustainable development. "The World Commission on Environment and Development (the Brundtland Commission) in its report to

the United Nations in 1987 defined sustainable development as meeting the needs of the present without compromising the ability of future generation to meet their own needs" (United Nations, 2020). Thus, the principles of sustainable development determine the future of social development, the future of business. The desire of entrepreneurs to coordinate business activities is due not only to economic benefits, but also to the motivation to create a social effect. The formation of an entrepreneurial strategy is based on clear performance criteria. In this regard, it was studied to what extent the concepts of "social responsibility" and "social value" correspond to the goals of sustainable development. Agenda 21, adopted during the United Nations Conference on Environment and Development (UNCED) called Earth Summit held in Rio de Janeiro in Brazil in 1992 is a blue print on how to make development socially, economically and environmentally sustainable (United Nations, 2020).

The results of the study of the degree of influence of social orientations on the achievement of the Sustainable Development Goals are presented in table 4.

Table 4 Compliance of the concepts of "social responsibility" and "social value" with the Sustainable Development Goals

Sustainable Development Goals (United Nations)	"Social responsibility"	"Social value"
Goal 1: No poverty		Enterprises that create social value are focused on involving people with different income levels in the creation of marketable products
Goal 2: Zero hunger		Manufacturing is focused on creating the most sought-after products, satisfaction is first and foremost of the basic needs
Goal 3: Good health and well-being	Development and active implementation of comprehensive wellness programs for the company's employees	
Goal 4: Quality education	Corporations and the government as stakeholders and partners in the design and creation of innovative educational programs	
Goal 5: Gender equality	Equal gender opportunities as part of corporate culture	Women's employment as a response to domestic violence, as well as equal gender opportunities for starting own business
Goal 6: Clean water and sanitation	Financing of environmental projects	Creating startups based on eco-developments
Goal 7: Affordable and clean energy		The implementation and promotion of innovative technological solutions based on green energy

Sustainable Development Goals (United Nations)	"Social responsibility"	"Social value"
Goal 8: Decent work and economic growth		Involvement of representatives of various social groups in the process of creating added value
Goal 9: Industry, innovation, and infrastructure	Investment in the creation and development of infrastructure to scale the business	
Goal 10: Reduced inequalities		Involvement of representatives of various social groups in the process of creating added value
Goal 11: Sustainable cities and communities		The implementation and promotion of innovative technological solutions based on green energy
Goal 12: Responsible consumption and production	Development of corporate ethics aimed at reducing the negative impact on the environment	Promotion of business ideas based on the principles of responsible consumption and production
Goal 13: Climate action	Development of corporate ethics aimed at reducing the negative impact on the environment	Promotion of business ideas based on the principles of responsible consumption and production
Goal 14: Life below water		Implementation and promotion of technological business ideas based on elimination of pollution results and improvement of ecosystems
Goal 15: Life on land		Implementation and promotion of technological business ideas based on elimination of pollution results and improvement of ecosystems
Goal 16: Peace, justice and strong institutions		Creating prerequisites for "bottom-up management"
Goal 17: Partnerships		Active interaction with stakeholders in order to implement business ideas and scale them
Total number of compliance points	7	14

Source: built by author

Thus, the concept of social value is more consistent with the goals of sustainable development. An entrepreneurial approach based on the creation of social value is becoming more relevant.

To test Hypothesis 2, we generalize the characteristics of millennials. Special attention is paid to the following issues:

- what products are most in demand by millennials (consumption characteristics);
- entrepreneurial activity of millennials (investment and creation of their own business);
- changing the standards of production activities (use of renewable energy and reuse of resources).

Based on the study of scientific materials devoted to the various socio-age groups of the population, the main information presented in Table 5 was systematized.

Table 5 Characteristics of social and age groups of the population

	Baby Boomer	Gen X	Gen Y (millennial)	Gen Z
	1946-1964	1965-1980	1981-1996	1997-2020
Age in 2020	56-74 years	40-55 years	24-39 years	Up to 23 years
Behavior basics	Idealism	Materialistic	Globalist	Undefined ID
	Collectivist	Competitive	Questioning	Communaholic
		Individualistic	Oriented to self	Dialoguer
				Realistic
Consumption	Ideology	Status	Experience	Uniqueness
focus	Movies	Brands	Travel	Unlimited
		Luxury	Flagships	Ethical

Source: built by author based on Fry & Parker, 2018, Van Den Bergh et al., 2019

Summarizing the results of modern research, scientific publications and global surveys, it is possible to identify the main criteria for revealing the socio-economic identity of the millennial generation. These results are presented in table 6 below.

Table 6 Socio-economic identity Gen Y (millennial)

Parameter	Characteristics
1) Balance of personal and social values	▪ ability to think comprehensively, be creative, responsible and find solutions to surrounding problems; ▪ low assessment of the influence of leaders on society and the desire of leaders to improve the world; ▪ the desire to travel and help society is greater (46%) than the desire to create families or own a business (34%); ▪ among the 20 problems facing society, the most personal concerns are about climate change and environmental protection.
2) Consumer behavior	▪ "42% of millennials said they started or deepened business relationships because the company's products or services have a positive impact on society and / or the environment"; ▪ 37% of millennials said they ended or weakened business relationships because of the company's ethical behavior; ▪ "36% of millennials started / deepened relationships because they believed the company was ethical"; ▪ millennials choose brands that actively voice social, cultural, political and environmental motivation; they are even willing to overpay for these brands.

Parameter	Characteristics
3) Attitude to business	▪ "millennials believe that businesses should prioritize the production of high-quality goods and services (36%) and job creation (35%)"; ▪ "the majority (55%) considers making a profit to be the main achievement of the business"; ▪ according to millennials, business does not make enough efforts to improve the skills of employees (33% said this is a priority; 16% said it is being implemented), improve society (32% vs. 16%), improve and protect the environment (27% vs. 12%); ▪ business (30%) is most responsible for training employees, followed by educational institutions (24%).
4) Entrepreneurial activity	▪ striving for an open atmosphere of cooperation. Millennials believe in themselves and their colleagues, because unlike previous generations, Generation Y was raised in an atmosphere of equal relations and joint decision-making; ▪ 55% of millennials are interested in starting their own business one day; ▪ 63% of millennials believe that the biggest obstacle to innovation is the attitude of management. ▪ 13% of millennials surveyed said that their career goal includes promotion. But 67 % stated their goal to start their own business.
5) A sense of social responsibility	▪ serious attitude to academic achievement (94% of millennials believe that higher education is necessary for success in life); ▪ the rate of violent crimes involving young people is at an all-time low. Since 1991, the number of teenage pregnancies has decreased by 51 %. The number of teenagers smoking has plummeted. Drug use has declined. All this indicates a higher level of responsibility; ▪ a high level of environmental component of demand (the use of green packaging promotes promotion among young consumers); ▪ a high degree of humanism and philanthropy (the average millennial gives almost $ 600 a year to charity).

Source: built by author based on Auliandri et al, 2018, Awaluddin & Hamid, 2019, Deloitte, 2020, Gay, 2017, Giarratana & Pasquini, 2019, Haber, 2016, Francis & Hoefel, 2020, Pew Research Center, 2020, Shetty et al, 2019, Smerichevskyi et al, 2018

Based on the table 6, it can be argued that Gen Y representatives are often personally concerned about social and environmental problems, and base their consumer choices on these assumptions. Millennials believe that business is responsible not only for the quality of products, but also for the educational, cultural and political components of public relations. In this regard, Gen Y is more motivated to create a business and is ready to take responsibility for the results of their business activities.

To test hypothesis 2, a statistical study of data from EU countries was also conducted on the example of France, Germany, Greece and Poland. Testing of hypothesis 2 was carried out in three directions:

1) Products most in demand by Gen Y representatives (consumption characteristics). Within the framework of the direction, the level of social inclusion (risk of poverty), the dynamics of greenhouse gas emissions were studied. The study of these indicators makes it possible to determine how rational and socially responsible millennials are in their consumption, as well as how representatives of this social group align their consumer ambitions with social and environmental effects.

2) Entrepreneurial activity of millennials. Within the framework of the direction, the level of investment of households and the dynamics of motivation to create their own business were studied. Based on the data of the Global Entrepreneurship Monitor, the indicator Entrepreneurship as a Good Career Choice Rate was studied (Fig. 5): "Percentage of 18-64 population who agree with the statement that in their country, most people consider starting a business as a desirable career choice" (Global Entrepreneurship Monitor, 2020). Regression analysis of these indicators makes it possible to draw a conclusion about the trends of responsibility for creating a public product, a healthy competitive environment.

3) Change in production standards. Within the framework of the direction, the degree of resource reuse and the level of renewable energy use were studied. The analysis of these indicators in connection with the dynamics of the composition of the social group of millennials makes it possible to assess the impact of Gen Y on the change in the priorities of production standards towards socialization and greening.

The indicators used in the study are consistent with the Sustainable Development Goals, such as no poverty, affordable and clean energy, decent work and economic growth, sustainable cities and communities, responsible consumption and production. It is these goals that correspond to the creation of social value.

The study was conducted using regression analysis methods based on statistical data Eurostat Database and Global Entrepreneurship Monitor in 2009-2019. Using regression analysis, hypotheses were tested regarding the presence of an "impact-result" relationship (linear dependence) between a number of the studied values. The main parameters of the studied models are:

1) R - the multiple correlation coefficient.
2) R^2 - the coefficient of determination that characterizes the quality of the model (the higher the value of this parameter, the greater the proportion of values that characterize this model).
3) The coefficients a and b, which are the parameters of the linear regression equation $Y=a+b*X$, where:

X - variable impact

Y - resulting parameter.

The sign and value of the coefficients a and b help to estimate the direction of the connection between Y and X, as well as the strength of this connection.

The results of the analysis are presented in the tables.

Table 7 Results of the regression analysis for Germany

X (impact)	Y (result)	R	R^2	Coefficient a	Coefficient b
Gen Y (millennial) population rate	Population at risk of poverty or social exclusion	0.69	0.48	0.79	-0.19
Gen Y (millennial) population rate	Greenhouse gas emissions	0.75	0.56	100.18	-1.12
Gen Y (millennial) population rate	Household investment share of GDP	0.69	0.48	4.19	0.08
Gen Y (millennial) population rate	Entrepreneurship as a Good Career Choice Rate	0.66	0.44	41.39	0.40
Gen Y (millennial) population rate	Circular material use rate	0.88	0.77	-2.53	0.59
Gen Y (millennial) population rate	Share of renewable energy in gross final energy consumption	0.90	0.82	-29.26	1.88

Source: built by author

Table 8 Results of the regression analysis for Greece

X (impact)	Y (result)	*R*	R^2	Coefficient *a*	Coefficient *b*
Gen Y (millennial) population rate	Population at risk of poverty or social exclusion	0.67	0.45	27.43	-1.33
Gen Y (millennial) population rate	Greenhouse gas emissions	0.92	0.84	364.62	-11.22
Gen Y (millennial) population rate	Household investment share of GDP	0.84	0.72	-55.65	2.20
Gen Y (millennial) population rate	Entrepreneurship as a Good Career Choice Rate	0.76	0.58	35.10	1.41
Gen Y (millennial) population rate	Circular material use rate	0.56	0.31	-9.95	0.52
Gen Y (millennial) population rate	Share of renewable energy in gross final energy consumption	0.89	0.79	-61.51	3.23

Source: built by author

Table 9 Results of the regression analysis for France

X (impact)	Y (result)	*R*	R^2	Coefficient *a*	Coefficient *b*
Gen Y (millennial) population rate	Population at risk of poverty or social exclusion	0.76	0.58	46.66	-1.17
Gen Y (millennial) population rate	Greenhouse gas emissions	0.71	0.51	169.3	-3.36
Gen Y (millennial) population rate	Household investment share of GDP	0.71	0.51	0.82	0.16
Gen Y (millennial) population rate	Entrepreneurship as a Good Career Choice Rate	0.67	0.45	4.57	2.23
Gen Y (millennial) population rate	Circular material use rate	0.76	0.59	-34.97	2.20
Gen Y (millennial) population rate	Share of renewable energy in gross final energy consumption	0.76	0.59	-50.15	2.67

Source: built by author

Table 10 Results of the regression analysis for Poland

X (impact)	Y (result)	*R*	R^2	Coefficient *a*	Coefficient *b*
Gen Y (millennial) population rate	Population at risk of poverty or social exclusion	0.64	0.41	32.53	-1.3
Gen Y (millennial) population rate	Greenhouse gas emissions	0.91	0.84	68.22	-1.65
Gen Y (millennial) population rate	Household investment share of GDP	0.89	0.79	0.7	0.30
Gen Y (millennial) population rate	Entrepreneurship as a Good Career Choice Rate	0.67	0.46	1.69	2.57
Gen Y (millennial) population rate	Circular material use rate	0.74	0.55	7.41	0.25
Gen Y (millennial) population rate	Share of renewable energy in gross final energy consumption	0.79	0.62	4.19	0.25

Source: built by author

According to the results of the regression analysis, in European countries there is a strong relationship between the number of millennials and the studied indicators (a linear relationship is confirmed in at least 41% of cases). At the same time, the values of the coefficients *a* indicate that the relationship between the number of Gen Y and the level of poverty, as well as the volume of greenhouse gas emissions, is reversed, i.e., with the growth of the number of millennial generation, these indicators tend to decrease. The relationship between the other indicators is direct, i.e. with the growth of the number of Gen Y, the level of household investment, motivation for entrepreneurial activity, circular use of resources, and the use of renewable energy increases.

The observed trends indicate an increase in not only consumer, but also entrepreneurial consciousness. This is reflected in the increasing orientation of business not only to reduce, but also to create a positive social impact (solving environmental problems, fighting poverty, helping vulnerable social groups). Given the growing share of Gen Y representatives in the population of countries, there is a high level of dependence between the social identity of Gen Y and the social orientation of entrepreneurship.

CONCLUSION

An in-depth study of the essence of the concepts of "social responsibility" and "social value", as well as their comparison based on the Sustainable Development Goals, allowed us to conclude that the orientation of modern business strategies to "social value" is more promising. It is the concept of "social value" that has an advantage over the concept of "social responsibility" according to such goals as no poverty, zero hunger, affordable and clean energy, decent work and economic growth, reduced inequalities, sustainable cities and communities, life below water, life on land, peace, justice and strong institutions, partnerships.

A review of the results of previous studies made it possible to formulate the main characteristics of the Gen Y, such as concern about social and environmental problems, belief in the responsibility of the business for the quality of products, as well as for the educational, cultural and political components of public relations, high level of motivation to create a business and to take responsibility for the results of their business activities.

The criteria formulated based on the obtained conclusions provided the basis for studying the role of the Gen Y in creating social value using regression analysis. The results of the analysis show that representatives of the millennial generation significantly determine the growth of social efficiency of business, namely, reducing the risk of social exclusion and the level of greenhouse gas emissions, as well as the growth of private investment and entrepreneurial activity, increasing the circular use of resources, and the use of renewable energy.

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MILENIJALCI U STVARANJU DRUŠTVENE VREDNOSTI PREDUZEĆA

Ovaj rad naglašava kreativne aktivnosti koje se nalaze u suštini koncepta „društvene vrednosti“ koja se stvara prilikom rešavanja konkretnih socijalnih problema. Društvenu odgovornost uglavnom određuje smanjenje negativnog uticaja preduzeća na osnovu podrške i razvijanja inovativnih projekata. Analitičko poređenje kategorija „društvena vrednost“ i „društvena odgovornost“ sa Ciljevima održivog razvoja otkrilo je da koncept „društvene vrednosti“ više korespondira sa strategijom održivog razvoja. Statističko proučavanje podataka iz evropskih zemalja omogućilo je da se izvede zaključak o povećanju društvene vrednosti u potrošnji, recikliranju proizvodnih resursa, korišćenju obnovljivih izvora energije i razvoju preferenci za rayvijanje sopstvenog biznisa. Na osnovu sprovedenog istraživanja, rad naglašava izuzetnu ulogu milenijalaca u modernizovanju pitanja društvenog fokusa biznisa.

Ključne reči: *društvena odgovornost, društvena vrednost, strategija održivog razvoja, Generacija Y*

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ANALYSIS OF LIMITATIONS OF ISO STANDARDS IMPLEMENTATION FROM THE EXTERNAL STAKEHOLDERS' POINT OF VIEW

UDC 006.83

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Abstract. *The purpose of this paper is to identify key limitations of the implementation of ISO 9001:2015 standard, their correlations, as well as the connection with the problems that companies face. The paper in literature review used the research papers of other researchers related to the limitations of the implementation of ISO standards. In order to realize the purpose of the research, empirical research was conducted. The research was realized by the method of a survey questionnaire, on the sample of 12 respondents, experts of consulting companies for the implementation of standards and lead auditors of accredited certification bodies for the implementation of ISO standards in Serbia. Using this approach based on external source ensures a certain level of objectivity. Also, the experience of the respondents based on the implementation of a process approach and certification of various organizations provides the necessary credibility and quality of the research itself. The paper identifies 12 limitations of implementation ISO 9001. The results of the research show that non-material limitations are the dominant obstacle to the implementation of ISO 9001:2015. Also, those limitations are positively correlated with each other, so they can cause multiple problems for companies in fulfilling the requirements of ISO standards.*

Key words*: process approach, ISO 9001, limitations, problems, solutions, empirical research.*

JEL Classification: L15, M11

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INTRODUCTION

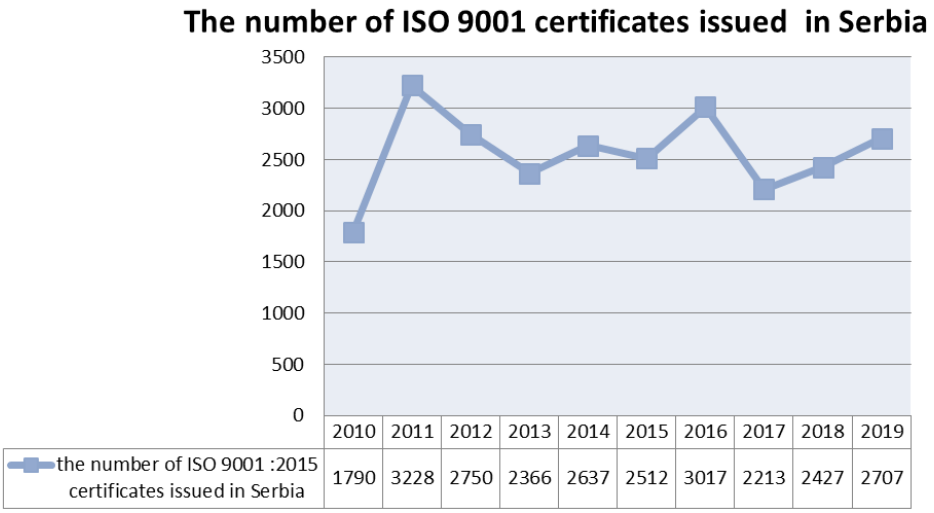
Process approach is a necessary condition for successful business of a modern company. Efficient and effective business process management ultimately ensures the creation of added value (for the company and its owners, users of products and services, employees, suppliers and all other stakeholders), increases competitive advantage, reduces business costs, improves product and service quality. Business process management is the core of quality management. In order to talk about quality of business processes in general, it is necessary to consider the standards that define quality. Globally, currently widely accepted quality management system is based on ISO 9001:2015 standard. All ISO 9001:2015 requirements are generic and can be applied in any organization, regardless of its type or size, or the products and services that organization provides. According to the latest ISO report for 2019 (published in September 2020, on the website www.iso.org), the total number of valid certificates at the global level shows that 883521 organizations are certified according to the ISO 9001:2015 standard, the second most important is ISO 14001 standard.

Graph 1 Number of ISO 9001 certificates issued for period of 10 years globally.
Source: Committee Survey results before 2018 (iso.org)

The chart of issued ISO 9001 certificates at the global level over a period of 10 years (Graph 1) shows a significant process of desertification according to ISO 9001:2015, after the last revision of this standard. The International Organization for Standardization explained the decrease in the number of certificates issued by the insufficient participation of certification bodies in annual reporting.

The countries with the most issued ISO 9001:2015 certificates according to the ISO 2019 Report are: China, Italy, Germany, India, Japan, Spain, Great Britain, France, USA and Brazil. In these 10 countries, 69% of ISO 9001:2015 certificates have been issued globally. When the subject of comparison are those European countries that have the most certified organizations according to ISO 9001:2015, the following can be noticed: in

Italy, the most issued certificates are in the field of services, wholesale and retail trade, construction, basic metal & fabricated metal products. Germany has the most certified organizations in basic metal & fabricated metal products, electrical and mechanical industry, trade, education and information technology. In Spain, these are construction, services, manufacturing, education and information technology. The UK has the most certified companies in basic metal & fabricated metal products, construction, trade and service industries. As far as Serbia is concerned, the leading activities are wholesale and retail trade, construction, manufacturing, services, education and information technology. It can be seen from the same database that Serbia had a loss of certificates in 2012 by 15%, while in 2017 the loss of certificates was 27%. In the last two years, there has been a slight growth of certified organizations.



Graph 2 Number of ISO 9001 certificates issued in Serbia
Source: Committee Survey results before 2018 (iso.org), Committee 09. ISO Survey of certifications to management system standards - Full results

Comparing Serbia to the countries in the region that have a certification system according to ISO 9001:2015, it can be noticed that Serbia does not differ significantly in the number of certificates issued, nor in the trend of certification. There are numerous and diverse reasons why companies are abandoning the certification of quality systems according to ISO 9001:2015. The reasons are undoubtedly related to the reasons for implementation and the limitations that companies encounter during implementation, which are not completely eliminated, but are only emphasized and complicated through the implementation.

LITERATURE REVIEW

During the implementation of the management system according to the requirements of the ISO 9001:2015 standard, organizations face certain limitations. These limitations have been studied by many authors. The theoretical part of the paper is based on the

analysis of the limitations of enterprises in general, because the literature concerning specific limitations in SMEs is not particularly available.

Talib and Rahman (2015) identified the following three groups of key barriers to TQM in the services sector and their impact on the implementation of ISO 9001:

1. „Barriers based on managerial issues - the most significant are the following: lack of top-management commitment, lack of coordination between departments, no benchmarking, poor planning, lack of communication,
2. Barriers based on people-oriented issues - lack of proper training and education, human resources barrier, employee resistance to change, inadequate use of empowerment and teamwork,
3. Barriers based on organizational issues - high turnover and absenteeism at the management level creates afflictions and nuisances in many organizations, attitude of employees towards quality, the lack of a continuous improvement culture.“

Othman et al. (2019) identified and ranked TQM management factors influencing the successful completion and sustainable construction of projects based on the Index of Relative Importance (RII) and the correlation between clients, consultants and contractors in the Malaysian construction industry. These factors are:

1. “Management commitment,
2. Employee related,
3. Customer related,
4. Organizational culture,
5. Communication related,
6. Strategic planning,
7. Teamwork,
8. Continuous improvement.”

Bounabri et al. (2018) in an empirical study on Barriers to ISO 9001 implementation Moroccan organizations, which included 115 companies, gave the following restrictions in implementation ISO 9001:

1. “Resistance to change,
2. Poor interdependence between departments,
3. Lack of top management commitment,
4. Dominance of bureaucracy,
5. Lack of internal communication among staff and between staff and top management,
6. Insufficient requirements diffusion to all organizational levels,
7. Lack of trainings,
8. Difficulty in changing culture,
9. Difficulty in process identification and management.”

According to a survey conducted by Gul Polat et al., (2011) on a sample of 80 Turkish construction companies, the following limitations for ISO 9001 successful implementation are identified:

1. “Lack of top management commitment,
2. Lack of top management support,
3. Lack of top management leadership,
4. Difficulties in mapping processes and developing standardized procedures,
5. Difficulties in taking corrective and preventive actions,
6. Difficulties in employing statistical quality control techniques in construction process,
7. Lack of workforce qualified in quality management implementations,
8. Lack of effective teams / team building skills,

9. Difficulties in including quality measures, continuously monitoring and controlling construction processes,
10. Need for employing skilled workforce,
11. Difficulties in developing quality information systems in construction process,
12. Difficulties in quantifying cost of poor quality,
13. Increases in paperwork,
14. Difficulties in finding workers, who can claim to be experts in both construction and quality,
15. Need for conducting continuous training programs for employees,
16. Difficulties in quantifying cost of quality,
17. High cost of developing and utilizing a quality management system,
18. Incompatibility of standardized quality management systems with the construction industry."

Sadikoglu and Olcay (2014) identified the following limitations on the implementation of ISO 9001 on a sample of 150 Turkish companies:

1. "Lack of employee involvement,
2. Inadequacy of the firm structure and lack of the resources,
3. Illiteracy and unawareness among the employees,
4. Constraints of the industry/market,
5. Inaccuracy and assessment difficulty in the process planning,
6. Inadequacy in the leadership comprehension,
7. Lack of understanding the importance of continuous improvement,
8. Discrepancies among customers' expectations,
9. Difficulty in the TQM structure,
10. Lack of the suppliers' support."

Sanchez-Lizarraga et al., (2020), on a sample of 172 organizations in exploratory analysis in the manufacturing sector in Mexico identified implementations barriers for ISO 9001 standard:

1. "Not demanded by the customers,
2. High investment,
3. The company manages a better QMS than ISO 9001,
4. Unnecessary for the industry,
5. Bureaucratic paper work,
6. Other reasons."

Almeida et al., (2018) the authors of an empirical study of Brazilian companies in the automotive supply chain, on a sample of 47 suppliers, identified the following implementation barriers for ISO 9001:

1. "Top management commitment,
2. Team commitment,
3. Training,
4. Responsibilities and authorities defined,
5. Schedule for implementation,
6. Quality culture,
7. Resources' availability,
8. Integration between departments,
9. Un-bureaucratic management system,
10. People awareness regarding the ISO 9001 significance."

Bounabri et al., (2018) gave a wide overview of the barriers that authors dealing with this issue in different countries have defined as shown in Table 1.

Table 1 Systematic review of ISO 9001 implementation barriers

Authors	Research method	Country and sample	Identified Barriers
Burcher, Lee & Waddell (2010)	Questionnaire	129 Australian and 175 British companies	Three main difficulties were identified for an organization when implementing quality initiatives in Australia: ▪ Communication ▪ Organizational inertia ▪ Commitment. While in Britain, commitment was singled out as the most significant factor
Kumar & Balakrishnan (2011)	Questionnaire	100 contractors from UAE	▪ Leadership related issues ▪ Strategy Related Issues ▪ Quality System related issues ▪ Society oriented gaps
Al-Najjar & Jawad (2011)	Questionnaire survey	42 companies in Iraq	▪ Top management commitment ▪ employee resistance ▪ Difficulty of performing internal audits ▪ Requirements of the standards are unrealistic
Willar (2012)	Questionnaire survey	77 companies in Indonesia	▪ ISO 9001 being a matter of fulfilling audit requirements ▪ Misleading QMS purposes ▪ Lack of a well-design reward system
Mosadeghrad (2014)	Literature review	54 empirical studies wordwide	▪ Insufficient education and training ▪ Lack of employees' involvement ▪ Lack of top management support ▪ Inadequate resources ▪ Deficient leadership ▪ Lack of a quality-oriented culture ▪ Poor communication ▪ Lack of a plan for change ▪ Employee resistance
Jayasundara & Rajini (2014)	Questionnaire survey	10 ISO 9001 well experienced professionals, in Sri Lanka	▪ Lack of top management involvement during the implementation process' ▪ Unwillingness of employees to change work systems ▪ Weak interdepartmental relations ▪ Employee resistance
Talib & Rahman (2015)	Literature review	General	▪ Lack of communication ▪ Lack of top-management commitment ▪ Employee's resistance to change ▪ Lack of coordination between departments

Source: Adapted according to - Implementation in Moroccan Organizations: Empirical Study, Noussaiba Bounabri, Ahmed Amine El Oumri, Elmadani Saad, Latifa Zerrouk, Amina Ibnlfassi, Journal of Industrial Engineering and Management, page 38

Sfakianaki and Kakouris (2020) explored barriers to ISO 9001 certification for SMEs in the Greek food and beverage industry (F&B) and concluded that the most common are bureaucracy, lack of senior management guidance, time and resource requirements, and employee response.

Very important implementation barriers for ISO 9001 are lack of involvement of top management, insufficient personnel qualifications, and employees' resistance to change, lack of knowledge and skills to implement TQM, and limited financial resources (Sampaio et al., 2014; Sfakianaki and Kakouris, 2020; Berrouiguet 2013).

Also the most frequent obstacles to ISO 9001 certification referred to in the literature are the cost of the QMS certification process, adaptation to the standard during implementation, employee resistance to change, qualification of human resources, employees' available time, the quantity of documentation required, top management involvement, compatibility of the standard with the activity sector (Ferreira & Candido, 2021). Willar et.al, (2015) identified issues of management attitude and purpose as barriers that may affect effective QMS implementation. The involvement of top management and the active participation of all employees are key factors for certification renewal, in the absence of which the company may not be able to renew its certificate (Sampaio et al., 2014).

The critical barriers for the successful implementation of TQM also can be inappropriate planning of TQM implementation program, lack of financial support, lack of employee training, lack of empowerment of employees, lack of sufficient physical resources (Talapatra & Uddin, 2019).

The basis for the successful implementation of ISO standards is a supportive environment (supportive leadership, culture, and structure), and the main obstacles are related to management and leadership. In this context, strategic problems are significant barriers to TQM implementation and have the most negative impact on its success. These are strategic barriers, structural barriers, human resource barriers, contextual barriers, and procedural barriers (Mosadeghrad, 2014). The environment where ISO standards are applied largely defines the key barriers to implementation. This is especially the case with an ethically poor business environment. Therefore, the barriers such as the lack of quality support, poor TQM knowledge and TQM awareness, poor information sharing, temporary workers, overdependence on contract document, poor data collection measurement, undefined TQM roles and responsibilities, award to lowest bidder tendency, poor business environment, and corruption are common (Dilawo & Salimi, 2019). Looking at the health services sector, in addition to barriers that occur in other SME sectors, there are other obstacles: high employee turnover, resistance to change among employees, bureaucracy and hierarchical structure, professional autonomy, tensions between managers and professionals, and difficulties in evaluating health processes and outcomes (Alsughayir 2014; Mosadeghrad 2013). Some authors consider barriers to be difficulties and divide them into difficulties related to employees, difficulties associated with structuring the quality management system, integration difficulties, and difficulties arising from planning (Anholon et al.,2018).

Based on the literature review, it can be said that certain research is based on case studies, while others involved sample based statistical analysis. Also, most of the research concerns the survey of companies, more precisely their representatives, but there are also surveys that are based on the examination or experts. In any case, a systematic review of the literature is a useful tool to formulate initial hypotheses and trace research directions. The literature review is the basis for the development of a survey questionnaire for the implementation of the empirical part of the research.

RESEARCH METHODOLOGY

Although it is evident that the implementation of process approach and the establishment of appropriate management systems, aimed at improving quality, has a positive impact on business performance, the trend of desertification and a significant list of limitations in the implementation of management systems according to ISO 9001:2015 indicate the need for more detailed analysis, especially for small and medium enterprises (SMEs). In this sense, the purpose of the paper is to identify key limitations, their correlations, as well as the connection between limitations and problems that companies face. In order to realize the purpose of the research, empirical research was conducted.

Research related to the implementation of process approach to ensure business excellence has a major limitation that is reflected in the subjectivity of the respondents, regardless of the research method used. Especially since the respondents are mostly from the managerial structure of the company (top managers, quality managers). Using an approach based on external source ensures a certain level of objectivity. Also, the experience of the respondents based on the implementation of a process approach and certification of various organizations provides necessary credibility and quality of the research itself. The research was realized by the survey questionnaire method on a sample of 12 respondents, including consulting companies' experts for the implementation of standards and lead auditors of accredited certification bodies for the implementation of ISO standards in Serbia, according to the Accreditation Body of Serbia (ATS). In order to achieve the purpose of the research, the paper tested several hypotheses:

H1: Non-material limitations compared to material have a greater impact on the success of the implementation of ISO 9001 standards,

H2: Most of the limitations faced by organizations in the implementation of ISO 9001 standards are positively correlated with each other,

H3: Limitations in the implementation of ISO 9001 lead to problems in fulfilling the requirements of the ISO 9001 standard.

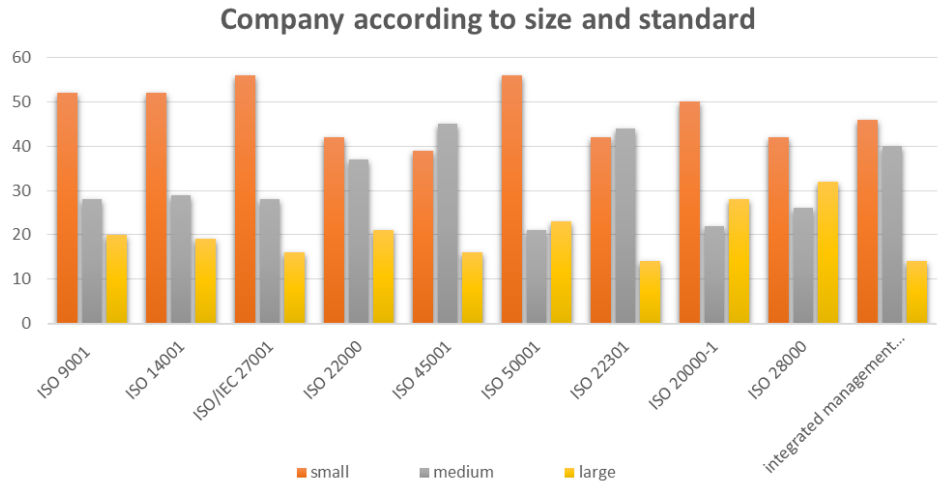
Analyzing the literature review, the limitations of implementing ISO 9001 standards in organizations can be classified as:

1. Lack of commitment of top management to the management system based on the processes and requirements of ISO 9001:2015,
2. Unclearly defined company strategies and goals,
3. Non-involvement of employees who are the bearers of the process in defining strategies and goals (centralized decision-making),
4. Resistance to change,
5. Inadequate internal communication between employees, also between employees and managers,
6. Lack of innovation and continuous learning,
7. Insufficient professional knowledge of the process bearers,
8. Lack of human resources management (HRM),
9. Lack of finance for implementation and certification according to the requirements of ISO 9001:2015,
10. Lack of adequate information system,
11. Inadequate customers and suppliers' databases,
12. Insufficient capabilities and skills of those employees who are key to quality (creativity, teamwork, critical thinking, emotional intelligence, negotiation, ability to solve complex problems).

These limitations represent a key segment of the survey questionnaire for experts. Certainly, for the purpose of complete analysis and testing of all hypotheses, a questionnaire included the questions that refer to the problem in fulfilling the requirements of the ISO 9001 standard, as well as questions concerning the capability of employees and ways of solving problems. Other questions that were part of the questionnaire were presented through the analysis of research results. To test the hypothesis, the collected data have been analyzed using the statistical analysis methods. In doing so, the following methods have been applied: descriptive statistics and correlation analysis, hierarchical cluster analysis.

RESEARCH RESULTS

The research was conducted in the period from December 22nd 2020 to February 11th 2021. Questionnaires were sent to the addresses of 30 consulting companies for the implementation and evaluation of ISO 9001:2015. The feedback was received from 12 consultants and lead auditors, which means that the response rate was 40%. The questionnaire is divided into general questions, the main questions of identifying limitations, the problems that limitations cause and the solutions.



Graph 3 Companies by size that were subject to implementation and certification according to the requirements of ISO standards

Source: Author's calculation

According to the answers, all respondents participated in the implementation of ISO 9001 standards and integrated management systems. 88% of them participated in the implementation of ISO / IEC27001, followed by ISO14001 and 77% of ISO 45001. 33% of them participated in the implementation of ISO 20000-1 and ISO 28000. Respondents applied the ISO 9001 standard in small enterprises in Serbia 52%, 28% were medium, 20% large enterprises. Thus, the answers of the respondents mainly refer to their experiences in the implementation of ISO 9001 standards in the SME sector in Serbia, which is the subject of this paper. In the survey of experts, answers were sought that refer only to the SME

sector. The questionnaire defined 12 limitations for the implementation of ISO 9001. The limitations are classified into two groups, non-material and material. The only **material limitation** relates to the lack of finance for implementation and certification according to the requirements of ISO 9001:2015. **Non-material** limitations are defined as:

1. **Limitations of human capital** - lack of commitment of top management to the management system based on processes and requirements of ISO 9001: 2015, unclear defined company strategy and goals, insufficient professional knowledge of the process holder,
2. **Limitations of structural capital** - lack of human resource management (HRM), lack of adequate information system, inadequate customers and suppliers' database,
3. **Limitations concerning organizational culture** - non-involvement of employees who are the bearers of the process in defining strategies and goals (centralized decision-making), resistance to change, inadequate internal communication between employees and between employees and managers, lack of innovation and continuous learning,
4. **Limitation of insufficient capabilities and skills** of those employees who are key to quality (creativity, teamwork, critical thinking, emotional intelligence, negotiation, ability to solve complex problems).

Table 2 Descriptive statistics: Limitations

	N	Minimum	Maximum	Mean	Std. Deviation
O1	12	1.00	5.00	4.0833	1.24011
O2	12	2.00	5.00	3.6667	.77850
O3	12	2.00	5.00	3.5000	1.08711
O4	12	1.00	5.00	2.2500	1.21543
O5	12	1.00	5.00	2.6667	1.23091
O6	12	1.00	4.00	2.6667	1.15470
O7	12	3.00	5.00	4.2500	.75378
O8	12	3.00	5.00	4.1667	.57735
O9	12	2.00	5.00	3.1667	.93744
O10	12	2.00	5.00	3.7500	1.21543
O11	12	1.00	4.00	3.0833	.79296
O12	12	1.00	3.00	2.1667	.71774

Source: Author's calculation

Descriptive statistics analysis from Table 2 shows that the highest average mean by respondents was assigned to the following limitations: Non-involvement of employees who are process bearers in defining strategies and goals (centralized decision making) - O7 (Mean 4.2500), Resistance to change - O8 (Mean 4.1667), Lack of commitment of top management to the management system based on processes and requirements ISO 9001:2015 - O1 (Mean 4,0833).

The low value of the standard deviation in these three defined limitations shows that the answers of the respondents do not differ significantly from each other. This actually points to the conclusion that respondents agreed that organizational culture is a key limitation for the application of ISO 9001 in enterprises. Group of limitations related to

intellectual capital (human, structural) average score 3.1389 with a larger difference in the answers of respondents (average standard deviation 1.1178) compared to a group of limitations related to organizational culture (Mean 3.833, Std. deviation 0.871). When it comes to the limitations of human and structural capital and their impact on the implementation of ISO 9001 in SMEs, according to the results, human capital is a larger limitation (Mean 3,7501, Std. deviation 1,03524) compared to structural capital (Mean 2, 5278, Std. deviation 1,2003). Limitation of insufficient capabilities and skills of those employees who are key to quality (creativity, teamwork, critical thinking, emotional intelligence, negotiation, ability to solve complex problems) O11 is according to the answers of respondents with a Mean of 3.0833, Std. deviation 0.79296 are proved to be a significant limiting factor in the implementation of ISO standards, immediately after the inadequate organizational culture and lack of intellectual capital. Limitation O12 according to the data in Table 2 with a Mean of 2.1667 with a small difference in the respondents' answers (Std. deviation 0.71774) shows that financial capital is the factor that least affects the implementation of ISO standards. Thus, the statement defined in hypothesis H1 is confirmed.

Respondents were asked to evaluate the capabilities of employees that most affect the success of the implementation of ISO 9001 in the company, and the results are presented in Table 3.

Table 3 Descriptive Statistics – Employees' capabilities

	N	Minimum	Maximum	Mean	Std. Deviation
SZ1	12	2.00	5.00	3.2500	1.13818
SZ2	12	2.00	4.00	3.4167	.90034
SZ3	12	1.00	5.00	3.4167	1.31137
SZ4	12	2.00	5.00	4.0000	.95346
SZ5	12	2.00	5.00	4.3333	.98473
SZ6	12	1.00	5.00	3.2500	1.28806
SZ7	12	3.00	5.00	4.2500	.86603
SZ8	12	1.00	5.00	2.9167	1.08362
SZ9	12	2.00	4.00	3.1667	.93744
SZ10	12	3.00	5.00	4.0833	.51493

Source: Author's calculation

The most evaluated capability is cooperation with others SZ5 (4.3333 respondents' answers do not differ significantly), then logical reasoning and decision-making SZ7, then cognitive flexibility SZ10, communication skills SZ4. The least important for the success of the implementation by respondents were negotiating SZ9 (3.1667) and service orientation SZ8 (2.9167).

Since organizations are complex holistic systems, the problems they face are mutually correlated. In that sense, a correlation analysis of the observed limitations of the implementation of the ISO series standards was performed. Regarding the correlation between limitations, the correlation analysis shows that the O1 limitation, defined as the lack of commitment of top management to the management system based on processes and requirements of ISO 9001:2015, is positively correlated with the O7, limitation non-involvement of employees in the process (centralized decision making). This actually indicates that if the responsibility does not come from the top of the organization and if

authorizations and responsibilities are not fully defined and assigned to all levels of management, quality has no chance. Also, a correlation coefficient of 0.621 clearly indicates that lack or inadequate use of human capital personified in lack of commitment top management of QMS and the lack of financial capital personified in the lack of finance for implementation and certification according to the requirements of ISO 9001:2015 may actually threaten the success of the implementation of this standard in the SME sector in Serbia. A correlation coefficient of 0.586 for O2 shows a positive correlation between the limitation of unclearly defined company strategy and goals and the limitation of non-involvement of employees who are the bearers of the process in defining strategies and goals (centralized decision-making).

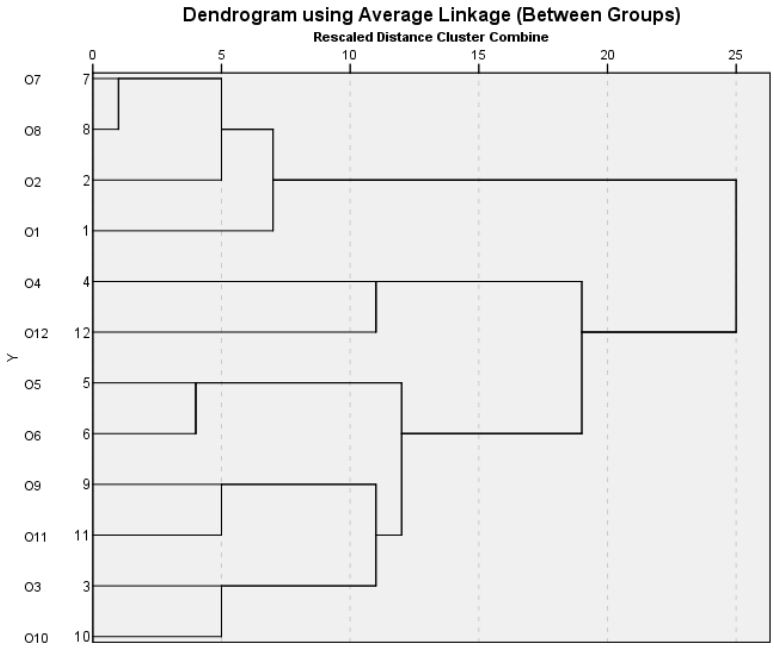
Table 4 Correlation between limitations

		O1	O2	O3	O4	O5	O6	O7	O8	O9	O10	O11	O12
O1	CC	1.000	.356	-.308	-.199	-.080	-.483	.585*	.285	.302	-.503	-.446	.621*
	Sig.		.256	.329	.536	.806	.112	.046	.368	.341	.095	.146	.031
	N	12	12	12	12	12	12	12	12	12	12	12	12
O2	CC	.356	1.000	.120	.174	.093	.246	.586*	-.260	.340	-.125	-.090	.524
	Sig.	.256		.711	.590	.773	.442	.045	.414	.280	.699	.781	.080
	N	12	12	12	12	12	12	12	12	12	12	12	12
O3	CC	-.308	.120	1.000	.509	.536	.573	.398	.302	.208	.557	.253	-.236
	Sig.	.329	.711		.091	.072	.052	.200	.340	.516	.060	.427	.460
	N	12	12	12	12	12	12	12	12	12	12	12	12
O4	CC	-.199	.174	.509	1.000	.577*	.341	.252	.274	.206	.699*	.183	-.074
	Sig.	.536	.590	.091		.050	.279	.429	.390	.521	.011	.569	.819
	N	12	12	12	12	12	12	12	12	12	12	12	12
O5	CC	-.080	.093	.536	.577*	1.000	.596*	.305	.244	.273	.734**	.052	-.181
	Sig.	.806	.773	.072	.050		.041	.335	.444	.391	.007	.873	.574
	N	12	12	12	12	12	12	12	12	12	12	12	12
O6	CC	-.483	.246	.573	.341	.596*	1.000	.071	-.157	-.092	.647*	.341	-.143
	Sig.	.112	.442	.052	.279	.041		.827	.625	.776	.023	.278	.657
	N	12	12	12	12	12	12	12	12	12	12	12	12
O7	CC	.585*	.586*	.398	.252	.305	.071	1.000	.336	.358	-.022	-.368	.173
	Sig.	.046	.045	.200	.429	.335	.827		.286	.253	.946	.240	.590
	N	12	12	12	12	12	12	12	12	12	12	12	12
O8	CC	.285	-.260	.302	.274	.244	-.157	.336	1.000	.496	.031	-.121	.188
	Sig.	.368	.414	.340	.390	.444	.625	.286		.101	.923	.707	.558
	N	12	12	12	12	12	12	12	12	12	12	12	12
O9	CC	.302	.340	.208	.206	.273	-.092	.358	.496	1.000	.070	.239	.370
	Sig.	.341	.280	.516	.521	.391	.776	.253	.101		.828	.455	.237
	N	12	12	12	12	12	12	12	12	12	12	12	12
O10	CC	-.503	-.125	.557	.699*	.734**	.647*	-.022	.031	.070	1.000	.445	-.449
	Sig.	.095	.699	.060	.011	.007	.023	.946	.923	.828		.147	.143
	N	12	12	12	12	12	12	12	12	12	12	12	12
O11	CC	-.446	-.090	.253	.183	.052	.341	-.368	-.121	.239	.445	1.000	-.060
	Sig.	.146	.781	.427	.569	.873	.278	.240	.707	.455	.147		.854
	N	12	12	12	12	12	12	12	12	12	12	12	12
O12	CC	.621*	.524	-.236	-.074	-.181	-.143	.173	.188	.370	-.449	-.060	1.000
	Sig.	.031	.080	.460	.819	.574	.657	.590	.558	.237	.143	.854	
	N	12	12	12	12	12	12	12	12	12	12	12	12

Source: Author's calculation

If the employees who are the bearers of the process are not involved in defining strategies and goals, then they will be unclear to them, and the inability to identify with the defined will negatively affect the efficiency of implementation of both strategies and

goals. Limitation lack of adequate information system O5 has the highest positive correlation (0.734) with limitation of O10 lack of innovation and continuous learning, and then with O6 inadequate database of customers and suppliers. Significant association with the limitation lack of innovation and lifelong learning (O10). The greatest correlation with other limitations is shown by the O10 limitation, the correlation coefficient with (O4-0,699, O5-0,734, O6-0,647), which actually suggests that organizations, when they want to increase their innovation and provide their employees with competitive knowledge and skills through continuous learning, go mostly in two directions. One is the provision of adequate databases and an adequate information system and the other is the efficient management of employees through professional HRM and adequate training. The lack of this significantly limits the implementation of ISO 9001 standards in SMEs. Based on the above, it can be stated that the second hypothesis should be accepted, i.e., that most of the limitations that organizations face in the implementation of ISO 9001 standards are positively correlated with each other.



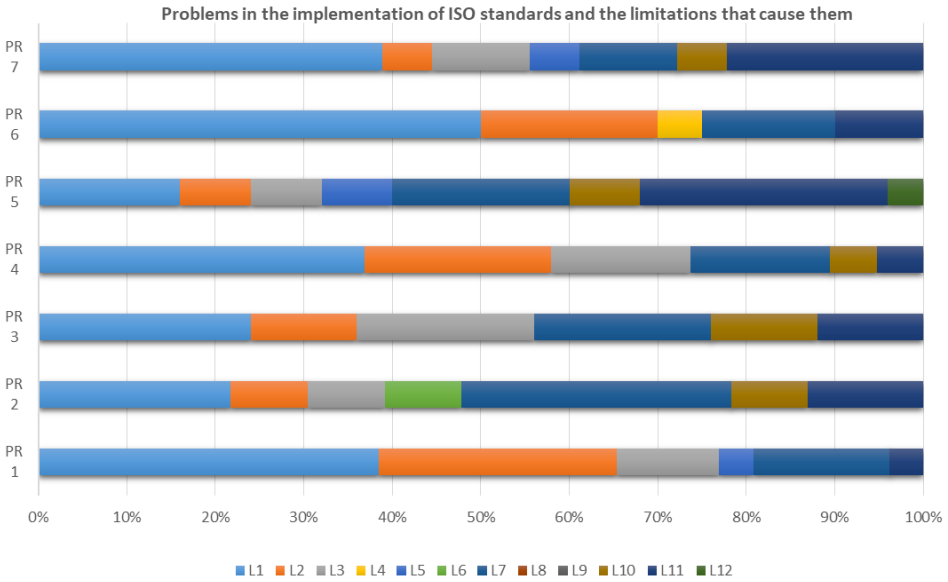
Dendrogram1 Relationship between groups of the limitations
Source: Author's calculation

Based on the model of hierarchical cluster analysis, the dendrogram shows the relationship between the limitations as follows: O7, O8, O2 and O1 are closely related, a slightly lower degree of connection is present in the limitations O9, O11, O3 and O10. There is also a significant correlation between the O5 and O6 limitations, while the O4 and O12 limitations are poorly interconnected and almost independent of the other limitations. Hierarchical cluster analysis showed that the lack of management commitment to the management system based on ISO 9001:2015 processes and requirements and centralized

decision-making result in unclear strategy and goals and employees due to non-involvement in defining them show resistance to any changes, including the implementation of ISO 9001. Variables: insufficient knowledge of the process holder, inadequate internal communication, lack of innovation and continuous learning, and insufficient developed skills of employees key to quality within a cluster, show the importance of a strategic approach that includes HRM which will provide employees with the necessary knowledge and skills and improve interpersonal communication.

Despite the fact that the limitation of the non-existence of HRM was assessed with almost the lowest average score by the respondents, cluster analysis and correlation analysis show the need for professional human resource management in companies. The identification of limitations is important due to their connection to problems in fulfilling the requirements of ISO standards. The problems are defined according to the key requirements of ISO 9001:2015, and their connection with the limitations provides an answer to the question - which requirements due to the number and type of limitations can be difficult to fulfil.

Respondents were asked to link problems to the limitations previously defined in the Questionnaire. Respondents were able to cite several different limitations as the cause for each problem.



Graph 4 Problems in the implementation of ISO standards and the limitations that cause them
Source: Author's calculation

The results of this comparative analysis are the following:

PR 1 - the problem of leadership and commitment of top management to QMS (problem in defining Business Policy, Quality Policy, strategy, quality goals and planning their realization, there is no focus on the user) is mostly influenced by intellectual capital constraints and organizational culture. Due to these limitations, it is difficult for a company to meet all the requirements related to leadership in standards.

PR 2 - The problem in process design and determining process owners (how to define them and who will manage the process, the problem in defining what documented information is needed) arises mostly due to limitations: non-involvement of employees who are process holders in defining strategies and goals (centralized decision making), inadequate internal communication between employees, also between employee and manager , lack of top management commitment to the management system based on ISO 9001: 2015 processes and requirements, insufficiently developed skills of those employees who are key to quality.

PR3 - The problem of performance evaluation, identification of KPIs processes and their measurement, monitoring and analysis, arises equally due to: lack of top management commitment to the management system based on processes and requirements ISO 9001: 2015, non-involvement of employees in defining strategies and goals (centralized decision making), and insufficient professional knowledge of the process holder in the first place. And then there are the poorly defined company strategies and goals and the lack of innovation and continuous learning.

PR4 - The problem of understanding the organization and its context, identifying stakeholders and their requirements, as well as keeping this information up to date is conditioned by the limitations of human capital and organizational culture.

PR5 - The problem in planning and managing the implementation of operational activities, design and development of products and services and management of outsource processes, products and services is caused by research results mostly due to insufficient capabilities and skills of those employees who are key to quality (creativity, teamwork, critical thinking, emotional intelligence, negotiation, ability to solve complex problems). After this cause, the lack of top management commitment to the management system based on the processes and requirements of ISO 9001: 2015, centralized decision-making and inadequate internal communication between employees, also between employees and managers equally affected the emergence of this problem.

PR6 -The problem in determining responsibilities and authorities for employees and process managers is primarily due to the commitment of management to QMS, and then unclearly defined strategies and goals and inadequate communication between employees and employees and managers.

PR7 - The problem of consistency in the implementation of the process approach (management of documented information and their changes, review by management, internal checks, identification of risks and opportunities, taking measures and control of their implementation) is a consequence of lack of top management commitment to management process based on ISO 9001: 2015, inadequate communication between employees, and between employees and managers, to a lesser extent also insufficient capabilities and skills of those employees who are key to quality.

Based on the above, it can be concluded that the third hypothesis should be accepted, i.e., that the limitations in the implementation of ISO 9001 lead to problems in fulfilling the requirements of ISO standards.

When it comes to the way of solving problems, respondents were given the opportunity to express their agreement or disagreement with the proposed solutions. For each of the proposed solutions, the results of the descriptive statistic analysis show high average score without significant differences in the answers of the respondents.

Table 5. Descriptive Statistics - Solutions

	N	Minimum	Maximum	Mean	Std. Deviation
R1	12	1.00	5.00	4.3333	1.23091
R2	12	2.00	5.00	3.8333	.93744
R3	12	3.00	5.00	4.3333	.65134
R4	12	3.00	5.00	4.7500	.62158
R5	12	4.00	5.00	4.5833	.51493
R6	12	3.00	5.00	4.3333	.77850
R7	12	2.00	5.00	3.9167	.90034
R8	12	1.00	5.00	4.1667	1.19342
R9	12	1.00	5.00	3.8333	1.11464
R10	12	2.00	5.00	4.1667	.93744
R11	12	4.00	5.00	4.4167	.51493
R12	12	3.00	5.00	4.0833	.66856
R13	12	3.00	5.00	3.9167	.66856

Source: Author's calculation

The most important solutions to the defined problems are identified as: R4 - Defining area of implementation of QMS and defined processes and their owners, ensuring management commitment and customer focus (Mean 4.7500, Std. deviation 0.62158), R5 - Providing full involvement of process owners in formulating all necessary documented information, updating them, defining KPIs (Mean 4.5833, Std. deviation 0.51493), R11 - Continuous review of documented information through internal checks, with defining corrective measures, control of their implementation (Mean 4.4167, Std. deviation 0.51493). As the least important solutions were evaluated R2 - Adequately defined quality goals and ways of achieving them, and R9 - Adequately defined Quality Policy and communication through the organization.

CONCLUSION

During the implementation and maintenance of quality management systems according to the requirements of ISO 9001:2015, organizations face many limitations, which if not eliminated during implementation, can only become more complicated and can lead to decertification. The results of the research show that non-material limitations are the dominant obstacle to the implementation of ISO 9001:2015. Also, they are positively correlated with each other and together they can cause problems for companies in fulfilling the requirements of ISO standards. The analysis showed that most problems in fulfilling the requirements of the standard (such as requirements related to leadership, understanding the organization and its context, as well as determining responsibilities and authorities for employees and managers), were actually caused by two human capital limitations (lack of top management commitment and poorly defined strategy and goals). When fulfilling the requirements for process design and determining the process owner, the most problems are caused by centralized decision-making and insufficiently developed skills of employees key to quality and commitment to quality management, which indicates the importance of strategic approach in process design and the need to establish process orientation. Problems can be most effectively solved by clearly defining the area of implementation of quality

management systems, defining processes and their owners, ensuring management commitment, ensuring full involvement of process owners in formulating all necessary documented information, updating them, defining KPIs for each process. Continuous review of documented information through internal checks, with the definition of corrective measures, and control of their implementation ensure the elimination of problems and fulfilling the requirements of the standard. Although the financial limitation is often cited as an excuse by company managers, the results of this research show the opposite. In this regard, future research should be devoted to a more detailed analysis of the limitations of a non-material nature.

Also, based on the results of the research, managers are suggested to provide the top management training concerning the requirements of the standard at the very beginning of the implementation in order to provide the necessary support for quality management systems. In addition, full involvement of process owners in defining quality strategies and objectives, process design and definition of documented procedures and performances of the processes, as well as their ongoing training to build capacity and capabilities to effectively implement quality management systems should be ensured. In this way, interpersonal communication will be improved and the resistance of employees to change reduced.

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ANALIZA OGRANIČENJA IMPLEMENTACIJE STANDARDA SERIJE ISO SA STANOVIŠTA EKSTERNIH STEJKHOLDERA

Svrha ovog rada je da se identifikuju ključna ograničenja primene standarda ISO 9001: 2015, njihove korelacije, kao i povezanost sa problemima sa kojima se kompanije susreću. U radu u pregledu literature korišćeni su istraživački radovi drugih istraživača koji se odnose na ograničenja primene ISO standarda. U cilju obezbeđenja svrhe istraživanja, sprovedeno je empirijsko istraživanje. Istraživanje je realizovano metodom anketnog upitnika, na uzorku od 12 ispitanika, konsultanata konsultantskih kompanija za primenu standarda i vodećih ocenjivača akreditovanih sertifikacionih tela za primenu ISO standarda u Srbiji. Korištenje ovog pristupa zasnovanog na eksternim izvorima osigurava određeni nivo objektivnosti. Takođe, iskustvo ispitanika u primeni procesnog pristupa i sertifikaciji različitih organizacija daje potreban kredibilitet i kvalitet samom istraživanju. U radu je identifikovano 12 ograničenja primene ISO 9001. Rezultati istraživanja pokazuju da su nematerijalna ograničenja dominantna prepreka primeni ISO 9001:2015. Ta su ograničenja pozitivno međusobno povezana, tako da kompanijama mogu stvoriti višestruke probleme u ispunjavanju zahteva ISO standarda.

Ključne reči: *procesni pristup, ISO 9001, ograničenja, problemi, rešenja, empirijsko istraživanje.*

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ASSESSING THE QUALITY OF COVID-19 DATA: EVIDENCE FROM NEWCOMB-BENFORD LAW

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Abstract. *The COVID-19 infection started in Wuhan, China, spreading all over the world, creating global healthcare and economic crisis. Countries all over the world are fighting hard against this pandemic; however, there are doubts on the reported number of cases. In this paper Newcomb-Benford Law is used for the detection of possible false number of reported COVID-19 cases. The analysis, when all countries have been observed together, showed that there is a doubt that countries potentially falsify their data of new COVID-19 cases of infection intentionally. When the analysis was lowered on the individual country level, it was shown that most countries do not diminish their numbers of new COVID-19 cases deliberately. It was found that distributions of COVID-19 data for 15% to 19% of countries for the first digit analysis and 30% to 39% of countries for the last digit analysis do not conform with the Newcomb-Benford Law distribution. Further investigation should be made in this field in order to validate the results of this research. The results obtained from this paper can be important for economic and health policy makers in order to guide COVID-19 surveillance and implement public health policy measures.*

Key words: *COVID-19, misreporting, Newcomb-Benford Law, Kolmogorov-Smirnov Z test, chi-square test*

JEL Classification: C12, I10

1. INTRODUCTION

The COVID-19 has been initially identified in Wuhan, China, spreading all over the world causing global healthcare and economic crisis. There has been a slowdown in all economic

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sectors worldwide, namely tourism, oil industry, aviation, financial and healthcare sector, Shohini (2020). The spread of the virus benefited from the underlying interconnectedness due to globalization, catapulting a global health crisis into a global economic shock, hitting the most vulnerable the hardest, United Nations (2020:6). World Health Organization declared the outbreak of the COVID-19 infection to be a public health emergency of international concern, Zhang (2020). Countries reported their first cases of infection transparently; however, there were doubts about the reported number of cases. There also appears to be a doubt regarding the reported number of cases in the early stages of the epidemic. There were ongoing concerns about the level of transparency around the data from China. The manipulation of pandemic numbers by underreporting for the interest of politics risks lives, Cambell and Gunia (2020). Accurate pandemic numbers are essential for shaping an ongoing response and in making informed decisions on easing restrictions. Reporting accurate numbers is hard because many countries have struggled with adequate testing, which skews the official numbers of those infected, Alwine and Goodrum Sterling (2020). The politics continue to obfuscate the inconvenient truths about the true numbers of COVID-19 cases and deaths. This was encouraged in order to create a false sense of security but the COVID-19 data must be collected and released independently of politics, Alwine and Goodrum Sterling (2020).

In this paper the interaction between new daily cases of COVID-19 disease and the conformance with the Newcomb-Benford Law (NBL) or Benford's Law, Newcomb (1881) and Benford (1938) was investigated. The aim of the analysis is primarily not to report whether a particular country misreports or manipulates the COVID-19 data. The purpose is to assess the quality of COVID-19 data by using Newcomb-Benford Law as a tool. Newcomb-Benford Law is a natural occurrence of digits which are not uniformly distributed. The property of the Newcomb-Benford Law is that the fraudulent or misreported data deviate significantly from the NBL distribution, Balashov et al. (2020). The analysis was made for the early stages of the epidemic for which the numbers of new cases rose exponentially and the Benford's Law should hold, Kennedy and Yam (2020). Benford's Law (BL), or Newcomb-Benford Law (NBL), has many applications in economics. The most important one is as a forensic accounting tool in auditing and fraud detection, Nigrini (2012). This paper follows on previous investigation in this field (Balashov et al. (2020), Kennedy and Yam (2020), Kilani and Georgiou (2020), Zhang (2020)) by analysing the conformance of COVID-19 data with the NBL distribution. In order to detect possible misreported numbers of infection, the distribution of first and last digits of the new cases of COVID-19 infection for 206 countries and self-government territories worldwide will be analysed. The compliance with the Newcomb-Benford Law will be inspected by using chi-square and Kolmogorov-Smirnov Z tests. The expected result is that the distribution of first digits of new COVID-19 cases of infection would follow the Newcomb-Benford Law distribution, meaning that countries do not falsify or diminish their COVID-19 data intentionally. It is also expected that the distribution of last digits in new cases of infection would follow the uniform distribution or equal probability of occurrence. Main contribution of this paper is comprehensive analysis of conformity between new cases of infection and NBL distribution for almost all countries and self-government dependencies in the world in the beginning period of the COVID-19 epidemic, from December 31st, 2019 to April 23rd, 2020.

Paper is organised in six sections. After the introduction, in literature review the history of Newcomb-Benford Law is explained with main applications in the field of economics and epidemiology. In the methodology and data section the Newcomb-Benford Law distribution is derived, the methodology for conducting the chi-square and Kolmogorov-

Smirnov Z tests explained as well as descriptive statistics of data. In the results and discussion section the main results of the analysis are displayed, both for the first and last digits of COVID-19 cases by using Newcomb-Benford Law and uniform distribution as a tool. Final chapter presents concluding remarks.

2. LITERATURE REVIEW

Benford's Law or Newcomb-Benford Law is a natural observation in many occurring selections of numbers for which the first digit is not uniformly distributed. The history of Newcomb-Benford Law originates in 1881 when Simon Newcomb (Newcomb, 1881) noticed that the first pages of logarithmic tables were more worn out than the rest. That implies there are more digits starting with the digit one than that is expected under the uniform distribution. Newcomb described this phenomenon in his paper "*Note on the Frequency of Use of the Different Digits in Natural Numbers*". Unaware of Newcomb's findings, Frank Benford came to the similar conclusion almost 60 years later in his paper "*The law of anomalous numbers*", Benford (1938). Therefore, Newcomb-Benford Law was named according to both deserving economists. Newcomb-Benford Law has applications in various fields of economics but the most important one is as a tool for forensic accounting and fraud detection, Nigrini (1996). Other applications of Newcomb-Benford Law are for campaign fraud detection, Cho and Gaines (2007), governmental statistics inspection, Hindls and Hronová (2015), fraudulent scientific data, Diekmann (2007) and for inspection whether countries falsify their economic data strategically, Michalski and Stoltz (2013).

Jošić and Žmuk (2018) used Benford's Law for psychological pricing detection. Seminal paper in this field was published by El Sehity et al. (2005) which analyses consumer price digits before and after the euro introduction. Another piece of empirical evidence on psychological pricing was related to Austrian retailers, Wagner and Jamsawang (2012). Zhang (2020) proposed a test for checking the reported number of COVID-19 cases in China using the Newcomb-Benford Law. The obtained p-value of 92.8% indicated that the distribution of COVID-19 cumulative cases abide by the Newcomb-Benford Law. The author stated that the reported number of cases could be lower than the real number of infected people due to the lack of medical equipment and resources. Balashov et al. (2020) used Newcomb-Benford Law to test whether countries manipulate their COVID-19 data during the pandemics. The most important finding of the paper was that democratic countries with higher values of gross domestic product per capita, higher healthcare expenditures and universal healthcare coverage are the ones less likely to deviate from the Newcomb-Benford Law. It was found that roughly one third out of the 185 countries in the world affected by the pandemics seem to misreport their data. Kennedy and Yam (2020) studied the applicability of Benford's Law to national COVID-19 case figures. The aim was to establish guidelines for methods of fraud detection in epidemiology. Benford's Law largely held across countries in the early stages of the epidemic for which the number of infected people is relatively small in regards to the population. This argument also held for the second digit analysis.

Kilani and Georgiou (2020) collected a database of potential data misreports by 171 countries regarding their COVID-19 daily reported cases. They employ three different tests (chi-square, Kuiper and Mean Absolute Deviation (MAD)) in order to determine if data for each observed country fit the Benford's Law. For most of the countries the results showed the conformity of COVID-19 data with the Benford's Law. Koch and

Okamura (2020) emphasized the importance of veracity of reported contagious diseases data in real time. The authors found that the Chinese, United States and Italian data matched the distribution expected by Benford's Law. If the numbers were taken from the exponential distribution, it could be demonstrated that they automatically follow the Benford's Law distribution, Lee et al. (2020). The number of cases of infections and/or deaths will not obey the Benford's Law if the current control interventions are successful in flattening the epidemic curve. It is the case when the epidemic growth rate is below the exponential growth rate. Investigating whether countries misreport or diminish their numbers of COVID-19 cases in the early stages of infection can be therefore considered as valid.

Moreno-Montoya (2020) propose a new test in evaluating compliance with the Benford's Law distribution in the case of small data samples because conventional statistical methods for evaluation of small data samples are controversial. According to Peng and Nagata (2020), China's empirical distribution of new cases of infection appears to be particularly different from other countries. Despite being the first country affected by the disease, there was a linear trend present in the early stages of infection. Silva and Figueiredo Filho (2020) employed Newcomb–Benford Law to evaluate the reliability of COVID-19 figures in Brazil in the period from February 25th to September 15th . They found strong evidence that Brazilian reports do not conform with the Newcomb-Benford Law theoretical predictions showing that the Brazilian epidemiological surveillance system failed to provide trustful data on the COVID-19 epidemic.

3. DATA AND METHODOLOGY

Newcomb-Benford Law (NBL) is empirical wellknown pattern for frequency of first digit occurrence in various datasets. The first digit is not uniformly distributed: the number one appears as a leading digit in 30.1% of cases, the number two appears as a leading digit in 17.6% of cases while the number nine occurs as the first digit in 4.5% of the time. Checking for conformance with the NBL would be the best approach in a forensic analysis looking at potential manipulations of the number of cases since the distribution of first digits that deviates from the expected distribution may indicate frauds, Lee et al. (2020:4). In this paper it is analysed whether distribution of new cases of COVID-19 disease conform with the Newcomb-Benford Law distribution for the first leading digit and whether distribution of new cases of the COVID-19 conform with the uniform distribution for the last digit. A reasonable assumption will be that COVID-19 new case numbers should follow the Newcomb-Benford Law distribution. It seems the infection grows exponentially, particularly at the beginning in the early stage, Zhang (2020). It is hard to fabricate data closely following the Newcomb-Benford Law distribution. That implies if the distribution of first digits for new daily cases of COVID-19 follows the NBL distribution then there is no misreporting or possible diminishing of the number of new daily cases. Also, it is expected that the distribution of last digits of new daily cases would follow the uniform distribution, meaning the same frequency of number occurrence, leading again to the conclusion that there are no frauds or misreports of data detected.

The probabilities of first digit occurrence in the Newcomb-Benford Law are derived using the following Equation 1:

$$p(d) = \log_{10}\left(1+\frac{1}{d}\right), \text{ where } d \in \{1,2,3,...,8,9\}. \quad (1)$$

The probabilities for the second digit occurrence in the NBL are derived from the Equation 2:

$$P(d) = \sum_{k=1}^{9} \log_{10}\left(1+\frac{1}{10k+d}\right), \text{ where } d = 0,1,2,...,9. \quad (2)$$

In Equation 3 the probabilities of occurrence for the higher-order digits up to the last digit with equal probability of 0.1 which is identical to uniform distribution are derived.

$$P(d_k) = \sum_{d_1=1}^{9}\sum_{d_2=0}^{9}...\sum_{d_{k-1}=0}^{9} \log_{10}\left(1+\frac{1}{\sum_{i=1}^{k} d_i \cdot 10^{k-i}}\right), \text{where } \; d_k = 0,1,2,...,9. \quad (3)$$

The calculated probabilities of occurrence for the first digit, second digit, higher-order and the last digit are presented in Table 1.

Table 1 Expected frequencies of digit occurrence in NBL distribution

Number	1st digit	2nd digit	3rd digit	4th digit	5th digit
0	-	0.11968	0.10178	0.10018	0.10
1	0.30103	0.11389	0.10138	0.10014	0.10
2	0.17609	0.10882	0.10097	0.10010	0.10
3	0.12494	0.10433	0.10057	0.10006	0.10
4	0.09691	0.10031	0.10018	0.10002	0.10
5	0.07918	0.09668	0.09979	0.09998	0.10
6	0.06695	0.09337	0.09940	0.09994	0.10
7	0.05799	0.09035	0.09902	0.09990	0.10
8	0.05115	0.08757	0.09864	0.09986	0.10
9	0.04576	0.08500	0.09827	0.09982	0.10

Source: Nigrini (1996), Jošić and Žmuk (2018)

Epidemics such as COVID-19, which we are experiencing at the moment, are classic examples of exponential growth function. The number of infected people tomorrow, I_1 , is equal to constant α times the amount of infected people today, I_0, that is $I_1 = \alpha \cdot I_0$. This expression could be generalized for *t* days as $I_1 = \alpha^t \cdot I_0$. This exponential growth could obey Newcomb-Benford Law, Peng and Nagata (2020). Kennedy and Yam (2020) provided a justification for the emergence of Benford's Law during the early stages of epidemic. Let *S*(*t*) denote the number of susceptible individuals. In the early stages of the epidemic the upper constraint of population size is negligible. Under the assumptions of fixed infectiousness $\theta > 0$, fixed recovery rate $\delta > 0$ and $\delta < \theta$, the evolution of *I*(*t*) can be described by:

$$I(t+1) = I(t) + (\theta + \varepsilon^I_{t+1})I(t) - (\delta + \varepsilon^R_{t+1})I(t) \quad (4)$$

for $t = 1,...,T-1$, ε_t^I are independent and identically distributed (i.i.d.) random noise terms, as are ε_t^R. The evolution of $S(t)$ is analogously defined as:

$$S(t+1) = S(t) - (\theta + \varepsilon_{t+1}^I)I(t) + (\delta + \varepsilon_{t+1}^R)I(t) \tag{5}$$

The epidemic growth of $I(t)$ can be further expressed as:

$$I(t+1) = A_{t+1} \times A_t \times ... \times A_1 \tag{6}$$

where

$$A_t \triangleq 1 + \theta - \delta + \varepsilon_t^I - \varepsilon_t^R \tag{7}$$

The Equation 6 suggests that Newcomb-Benford Law should emerge naturally during the early stages of an epidemic.

Data about new cases of COVID-19 infection are taken from the EU Open Data Portal database, EU Open Data Portal (2020). The number of new cases is observed from the start of the infection, from December 31st, 2019 up to April 23rd, 2020. The days in which there were no new cases of COVID-19 infection were omitted from the analysis. The data for overall 206 countries and self-government dependencies in the world were collected. Firstly, the analysis will be conducted by taking into account all observed countries together. After that the analysis will be conducted for each country separately. In order to inspect whether the distributions of the first and the last digits follow NBL or uniform distribution, chi-square and Kolmogorov-Smirnov Z tests will be used. The chi-square test values will be calculated by using the following Equation 8:

$$\chi^2 = \sum_{i=1}^{n} \frac{(f_i - e_i)^2}{e_i} \tag{8}$$

where f_i are the actual values for the i-th first digit or the i-th last digit, e_i are actual values of the i-the first digit or the i-th last digit under the assumption that the distribution of the first digits is distributed according to the NBL distribution and the distribution of the last digits is distributed according to the uniform distribution. Similarly, the values for Kolmogorov-Smirnov Z test will be calculated as follows:

$$K - S = \frac{\sqrt{-\frac{1}{2}ln\left(\frac{\alpha}{2}\right)}}{\sqrt{n}} \tag{9}$$

where α is statistical significance level (here 0.05) and n is the total number of new daily values. For both statistical tests the null hypothesis contains an assumption that the observed daily new cases of COVID-19 will follow the certain distribution (here NBL or uniform distribution). On the other hand, the alternative hypothesis assumes that the observed data will not follow the certain data distribution. Before conducting the chi-square and Kolmogorov-Smirnov Z tests, basic descriptive statistics analysis was done. In Table 2 basic descriptive statistics results for the new cases of COVID-19 infection, first digit and the last digit of the new cases by taking into account all countries together are presented.

Table 2 Descriptive statistics for the new cases, first and last digit, all countries together, daily values from December 31st, 2019 to April 23rd, 2020

Statistics	New cases	First digit	Last digit
Sample size	6,787	6,787	6,787
Mean	381.36	3.17	3.95
Standard deviation	1,998.73	2.34	2.76
Coeff. of variation	524%	74%	70%
Skewness	12	0.98	0.35
Kurtosis	176	-0.09	-1.11
Mode	1	1	1
Minimum	1	1	0
1st quartile	4	1	1
Median	19	2	4
3rd quartile	106	5	6
Maximum	37,289	9	9
Range	37,288	8	9
Interquartile range	102	4	5

Source: EU Open Data Portal (2020), authors.

According to the results from Table 2 there were overall 6,787 daily data about new cases of COVID-19 infection. The total number of days in the observed period was 12,596, but there were 5,809 days without new cases of infection which were excluded from the analysis. On average there were 381 new cases of infection daily with an average deviation of 1,999 new cases or 524%. The very high variability level is obvious if just minimum and maximum values are compared. From the new cases values their first and last digits are taken and basic descriptive statistics analysis is conducted as well. The results are shown in the last two columns and they are quite similar.

4. Results and Discussion

In addition to the numeric analysis for the first digits, their distributions and comparison with the Newcomb-Benford Law distribution are graphically shown in Figure 1. According to the Figure 1, the most common first digit is one. It appeared in 2,279 cases or 33.58% of total cases. On the other hand, the number eight the lowest appearance had; it appeared in 244 cases or 3.60% of total cases. From the graphical analysis it can be seen that the daily distribution of new cases of infection and Newcomb-Benford Law distribution are close to each other indicating that the distribution of the first digits for new cases of COVID-19 infection is conforming with the Newcomb-Benford Law distribution. However, in order to be sure, statistical tests (chi-square and Kolmogorov-Smirnov Z test) are going to be applied. The results of the chi-square and the Kolmogorov-Smirnov Z tests for the first digit of new cases of COVID-19 infection on the overall sample of countries are presented in Tables 2 and 3.

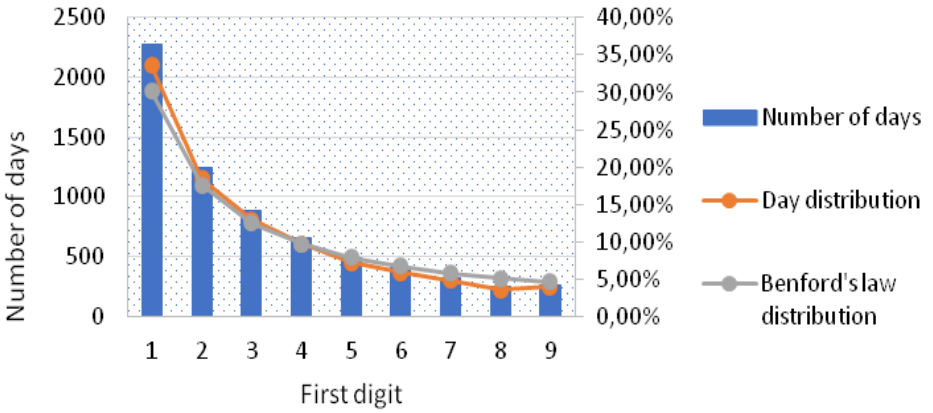

Fig. 1 Distribution of first digits of the new cases and comparison with the NBL distribution

It is examined whether distribution of first digits in the sample follows the distribution defined by the Newcomb-Benford Law. The hypotheses are as follows:

H_0... *The distribution of first digits for the number of new cases of COVID-19 follows the distribution defined by the Newcomb-Benford Law.*

H_1... *The distribution of first digits for the number of new cases of COVID-19 does not follow the distribution defined by the Newcomb-Benford Law.*

Table 3 Chi-square test for the first digit of new cases of COVID-19 infection

First digit	Number of days	Percentage of days	Benford rate	f_i	e_i	$(f_i-e_i)^2/e_i$
1	2,279	33.58%	30.10%	2,279	2,043	27
2	1,250	18.42%	17.61%	1,250	1,195	3
3	882	13.00%	12.49%	882	848	1
4	657	9.68%	9.69%	657	658	0
5	486	7.16%	7.92%	486	537	5
6	400	5.89%	6.69%	400	454	7
7	324	4.77%	5.80%	324	394	12
8	244	3.60%	5.12%	244	347	31
9	265	3.90%	4.58%	265	311	7
Total obs.	6,787	100.00%	100.00%	6,787	6,787	92

Source: Authors' calculations.

According to the chi-square test results presented in Table 3 (empirical chi-square value equal to 92.196, theoretical chi-square of 15.51 (α=0,05), p-value < 0.0001 and with 8 degrees of freedom) the null hypothesis of the chi-square test can be rejected at any commonly used statistical significance level. It can be concluded that the first digit distribution of new cases, when all countries are observed together, is not following the Newcomb-Benford Law distribution, meaning that countries are possibly misreporting the number of new COVID-19 cases of infection. Comparison of the first digit cumulative density distribution of COVID-19

new cases and the cumulative density of Newcomb-Benford Law distribution is presented in Figure A1 in Appendix.

Table 4 Kolmogorov-Smirnov Z test for the first digit of new cases of COVID-19 infection

First digit	Number of days	Percentage of days	Benford rate	Cum. density new cases distribution	Cum. density Benford's law distribution	Absolute difference
1	2,279	33.58%	30.10%	0.3358	0.3010	0.0348
2	1,250	18.42%	17.61%	0.5200	0.4771	0.0428
3	882	13.00%	12.49%	0.6499	0.6021	0.0479
4	657	9.68%	9.69%	0.7467	0.6990	0.0478
5	486	7.16%	7.92%	0.8183	0.7782	0.0402
6	400	5.89%	6.69%	0.8773	0.8451	0.0322
7	324	4.77%	5.80%	0.9250	0.9031	0.0219
8	244	3.60%	5.12%	0.9610	0.9542	0.0067
9	265	3.90%	4.58%	1.0000	1.0000	0.0000
Total	6,787	100.00%	100.00%	-	-	-

Source: Authors' calculations.

Again, at first, it could be said that the first digit distribution of new cases follows the Newcomb Benford Law distribution. However, the conducted Kolmogorov-Smirnov Z test (empirical test value equal to 0.0479, theoretical K-S value of 0.0015) indicates that the null hypothesis can be rejected at any commonly used statistically significant level. So, the conclusion is that the first digit distribution of new cases does not follow the Newcomb-Benford Law distribution. In Figure 2 distribution of last digits of the new cases of COVID-19 and comparison with the uniform distribution is presented.

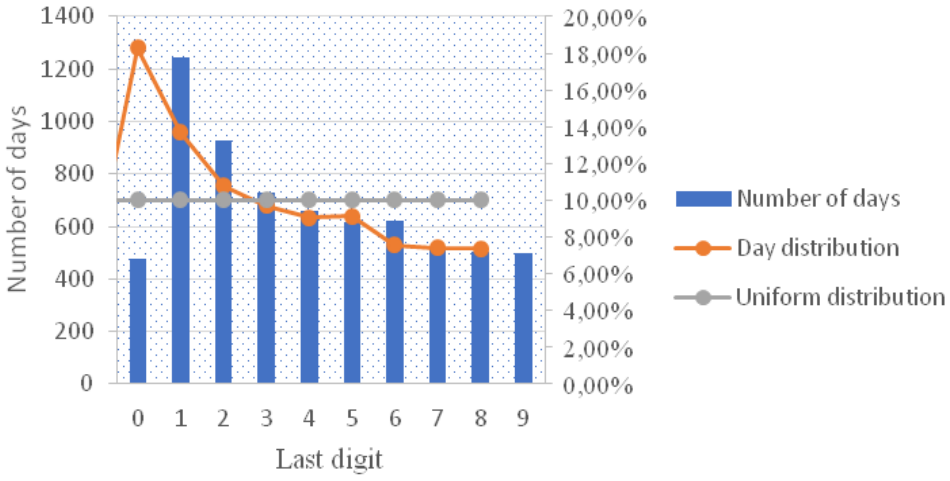

Fig. 2 Distribution of last digits of the cases and comparison with the uniform distribution

According to the Figure 2 the most common last digit is one (1,242 cases or 18.30% of total cases) and the least common last digit is zero (478 cases or 7.04% of total cases).

From the graphical representation it is obvious that the last digit distribution of new cases does not follow the uniform distribution. In the following hypotheses it is examined whether distribution of the last digits in the sample conforms with the uniform distribution.

H_0... *The distribution of the last digits for the new cases of COVID-19 infection follows the uniform distribution.*

H_1... *The distribution of the last digits for the new cases of COVID-19 infection does not follow the uniform distribution.*

Table 5 Chi-square test for the last digit of new cases of COVID-19 infection

Last digit	Number of days	Percentage of units	Uniform distribution	f_i	e_i	$(f_i-e_i)^2/e_i$
0	478	7.04%	10.00%	478	679	59
1	1,242	18.30%	10.00%	1,242	679	468
2	928	13.67%	10.00%	928	679	92
3	731	10.77%	10.00%	731	679	4
4	658	9.70%	10.00%	658	679	1
5	614	9.05%	10.00%	614	679	6
6	620	9.14%	10.00%	620	679	5
7	513	7.56%	10.00%	513	679	40
8	502	7.40%	10.00%	502	679	46
9	501	7.38%	10.00%	501	679	47
Total	6,787	100.00%	100.00%	6,787	6,787	767

Source: Authors' calculations.

The conducted chi-square test (empirical chi-square value equal to 767.33, theoretical chi square 16.92, p-value < 0.0001 with 9 degrees of freedom) confirmed that the null hypothesis of the test can be rejected at any usually used statistically significance level. In Figure A2 in Appendix the comparison between the last digit cumulative density distribution of new cases and the cumulative density uniform distribution is presented.

Table 6 Kolmogorov-Smirnov Z test for the last digit of new cases of COVID-19 infection

Last digit	Number of days	Percentage of units	Uniform distribution	Cumulative density new cases distribution	Cumulative density uniform distribution
0	478	7.04%	10.00%	0.0704	0.1000
1	1,242	18.30%	10.00%	0.2534	0.2000
2	928	13.67%	10.00%	0.3902	0.3000
3	731	10.77%	10.00%	0.4979	0.4000
4	658	9.70%	10.00%	0.5948	0.5000
5	614	9.05%	10.00%	0.6853	0.6000
6	620	9.14%	10.00%	0.7766	0.7000
7	513	7.56%	10.00%	0.8522	0.8000
8	502	7.40%	10.00%	0.9262	0.9000
9	501	7.38%	10.00%	1.0000	1.0000
Total	6,787	100.00%	100.00%	-	-

Source: Authors' calculations.

The Kolmogorov-Smirnov Z test (empirical test value equal to 0.0979 and theoretical Kolmogorov-Smirnov Z value of 0.0015) led to the same conclusion as the corresponding chi-square test. The conclusion is that the last digit distribution of new cases does not follow the uniform distribution. It can be concluded that when all countries in the world are observed together, there is a potential doubt that countries misreport their data of new cases of infection. The same analysis, as explained here for all countries together, is conducted for each country separately. The aggregated results are shown in Table 7.

Table 7 Summary results for individual countries, 206 countries, data are daily values of new cases in the period from December 31st, 2019 to April 23rd, 2020

Continent	Test conclusion at significance level 0.05	Null hypothesis: the distribution of the first digits of new cases is following the NBL distribution		Null hypothesis: the distribution of the last digits of new cases is following the uniform distribution	
		Chi-square test	Kolmogorov-Smirnov Z test	Chi-square test	Kolmogorov-Smirnov Z test
Overall	Do not reject null hypothesis	167	175	127	146
	Reject null hypothesis	39	31	79	60
Africa	Do not reject null hypothesis	50	47	28	32
	Reject null hypothesis	2	5	24	20
America	Do not reject null hypothesis	40	43	22	34
	Reject null hypothesis	9	6	27	15
Asia	Do not reject null hypothesis	32	34	27	27
	Reject null hypothesis	10	8	15	15
Europe	Do not reject null hypothesis	36	43	46	48
	Reject null hypothesis	18	11	8	6
Oceania	Do not reject null hypothesis	8	7	3	4
	Reject null hypothesis	0	1	5	4
Other	Do not reject null hypothesis	1	1	1	1
	Reject null hypothesis	0	0	0	0

Source: EU Open Data Portal (2020), authors.

When the analysis is lowered on the individual country level, different conclusions could bereached. Detailed results of conducted chi-square and Kolmogorov-Smirnov Z tests for the first and last digit for 206 countries and self-government dependencies are presented in Table A1 in Appendix. The chi-square tests have shown that for 167 countries (out of 206) the distribution of the first digits for new cases follows the Newcomb Benford's distribution meaning that countries do not misreport or diminish data of new cases of COVID-19. The distribution of the last digits of new cases is following the uniform distribution for 127 countries, leading to the similar conclusion. The Kolmogorov-Smirnov Z tests results are going even more in favour of not rejecting the null hypothesis. The difference between the results achieved in the analysis for all countries together and on the individual country level can be explained with heterogeneity in data or unique characteristics of each individual country.

The obtained results are in the line with previous investigation in this field of research, however, there is no general theory that the epidemics like COVID-19 should obey the Newcomb-Benford Law. Balashov et al. (2020) came to the conclusion that roughly one third out of 185 countries misreport their data intentionally, which are results similar to our

findings. We found that 39 out of 206 countries for the chi-square test and 31 out of 206 countries for the Kolmogorov-Smirnov Z test for the first digit analysis which is result in the range of 15%-19% of countries, potentially misreport their data. On the other hand, we found that 79 out of 206 countries for the chi-square test and 60 out of 206 countries for the Kolmogorov-Smirnov Z test for the last digit analysis, which is in the range of 29%-38% of countries, potentially misreport their data. Lee at al. (2020) found that 9 out of 10 countries satisfy the Newcomb-Benford Law, indicating that the growth rates of COVID-19 in these 9 countries were close to an exponential trend. Kilani and Georgiou (2020) made ranges of tests (chi-square, Kuiper and MAD) for 171 countries regarding their COVID-19 daily reported cases. The results of chi-square and Kuiper tests mostly confirmed the conformity with the Benford's Law, in 78.4% and 65.50% respectively. On the other hand, the MAD test pointed out to different conclusion; 111 out of 171 countries or 64.91% showed the non-conformity with the Newcomb-Benford Law. The authors devised the conformity ranges with the NBL distributions dividing them into close conformity, acceptable conformity, marginable acceptable conformity and nonconformity.

Kennedy and Yam (2020) found empirical evidence that Benford's Law largely hold across countries while deviations could be easily explained, including constrained testing, poorly defined start dates or government intervention through social distancing measures in slowing down transmission of the disease. Zhang (2020) showed that Newcomb-Benford Law held for the cumulative case numbers of COVID-19 on data for 31 province-level divisions in China in the period from January 15th 2020 to February 10th 2020. There were overall 628 data points in the analysis which was not a big dataset compared to ours (6,787 data points). Miranda (2020) conducted test of frauds by examining the cumulative distribution of the Philipinnian COVID-19 data and the Newcomb-Benford Law distribution by employing the Kolmogorov-Smirnov test in order to analyse the differences between the distributions. The data were used for three months after the first case of COVID-19 in the country, that is in the beginning of the epidemic, similar as in this paper. There was no significant difference between the COVID-19 data's first digit distribution and the distribution set by NBL suggesting no evidence for data manipulation. Wong et al. (2020) focused the study on two Southeast Asian countries: Indonesia and Malaysia during the period between March and November 2020. A chi-square test was recruited to quantify the closeness of the data and Newcomb-Benford Law distribution. Distribution of daily infection and death cases in Indonesia followed the Newcomb-Benford Law while the opposite result was obtained for Malaysia.

Contribution of this paper to the existing theory and knowledge in this field of research is twofold. Firstly, in line with conducting the first digit analysis for the new cases of COVID-19 infection, the analysis was broadened to the last digit analysis using uniform distribution as a reference distribution. Secondly, the dataset included almost all countries in the world with consequent cases of infection at the beginning of the epidemics. According to the Kennedy and Yam (2020) there are some ambiguities in how the timeline of the epidemic should be defined; the beginning of the epidemic should be set on date when sustained community transmission firstly occur, as opposed to the emergence of the first case of infection.

This study has important implications for the government health care systems and overall community. Similar tests can be applied to epidemics other than COVID-19. Countries should report their numbers of COVID-19 cases correctly. However, the motivation for possible data misreporting or diminishing could be to avoid travel bans and decline in tourism.

That could lead to taking the disease not seriously so there is clear need to verify the data throughout rigorous statistical techniques, help detect fraudulent behavior and verify the authenticity of published figures. Without valid data it is almost impossible to correctly evaluate the government intervention measures. It can be concluded that falsifying epidemic data is a short-lived strategy for governments and is not sustainable over the long run, Balashov et al. (2020).

5. CONCLUSIONS

Main findings of the paper can be summarized as: (1) the results of the Kolmogorov-Smirnov Z test and chi-square test, when all countries in the world were observed together, pointed out to the conclusion that the distribution of the first digits of new COVID-19 cases was not following the NBL distribution meaning that countries are potentially misreporting their COVID-19 data, (2) the aforementioned tests confirmed that the distribution of the last digits of new cases did not follow the uniform distribution, (3) when the analysis was lowered on an individual country level, both tests, chi-square and Kolmogorov-Smirnov Z test, pointed out to the conclusion that the distribution of first digits in most cases (167 out of 206 and 175 out of 206) obey the NBL, indicating that most of the countries do not diminish their numbers of new COVID-19 cases deliberately, (4) when the distribution of the last digits of new cases of infection was observed, the similar conclusion could be reached.

It can be concluded that the quality of COVID-19 data in most of countries in the world at the beginning of the epidemic is on the satisfactory level of trust. The divergences from the expected distributions should not be attributed to the deliberate falsification of data from governments but possibly from the low quality or structural breaks in data. In addition, government measures intended to flatten the epidemic curve could influence the results even at the early stages of the epidemic, in its exponential phase of growth. When the main findings of this paper are compared with the previous research it can be said that they are in the line with the state of the art of economic theory. The COVID-19 data show exponential growth at the beginning of the epidemic with distribution conforming with the Newcomb-Benford Law distribution.

Limitations of the research are related to the uneven number of observed days of infection duration for the each observed country, meaning that the reported number of cases is actually lower than the real number of infected people. The data are incomplete due to the lack of medical equipment and resources with many suspected cases remaining to be confirmed. There is also a cyclic component of data reports on weekends, especially Sundays, for which the data of new cases of infection are usually lower due to less testing on these days.

There are several areas of future research that could be built upon this paper such as detailed analysis of individual countries, second and/or higher order digit analysis, observation of cumulative number of cases or the number of reported deaths. The spread of the disease come in waves, so similar analysis could be made for the start of the second and third wave of infection or any other successive wave. The methodology displayed in this paper could be additionally improved in order to include government measures for preventing the disease through limitation of social contacts and lockdowns, in testing the compliance of COVID-19 data distribution with the Newcomb-Benford Law distribution. The results

obtained in this paper can be important for economic and health policy makers in order to guide the COVID-19 surveillance by evaluating the effectiveness and performance of COVID-19 control interventions and public health surveillance systems.

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PROCENA KVALITETA COVID-19 PODATAKA: PRIMENA NEWCOMB-BENFORDOVOG ZAKONA

Infekcija COVID-19 započela je u kineskom grad Wuhanu, šireći se celim svetom stvarajući globalnu zdravstveno-zaštitnu i ekonomsku krizu. Zemlje širomsveta se žestoko bore protiv ove pandemije, međutim, postoje sumnje u prijavljeni broj zaraženih ljudi. U ovom se radu Newcomb-Benfordov zakon koristi za otkrivanje lažnog broja prijavljenih slučajeva COVID-19. Analiza, kada su sve zemlje posmatrane zajedno, je pokazala da postoji potencijalna sumnja da zemlje prijavljuju lažne podatke o novim slučajevima zaraze. Kada je analiza spuštena na nivopojedinih zemalja, pokazala je da većina zemalja ne umanjuje broj novih slučajeva COVID-19 namerno. U analizi prvih cifara je utvrđeno da u 15-19 odsto slučajeva kao i u analizi zadnjihcifara u 30-39 odsto slučajeva da distribucija COVID-19 brojki ne odgovara distribuciji Newcomb-Benfordovog zakona. Međutim, na ovom polju je potrebno činiti daljnja istraživanja kako bi se potvrdili rezultati ovog rada. Rezultati dobijeni u ovom istraživanju mogu biti važni za kreatore ekonomskih i javno-zdravstvenih politika kako bi usmeravali nadzor nad COVID-19 sprovođenjem mera politike javnog zdravstva.

Ključne reči: *COVID-19, pogrešno prijavljivanje, Newcomb-Benfordov zakon, Kolmogorov-Smirnov Z test, hi-kvadrat test*

APPENDIX

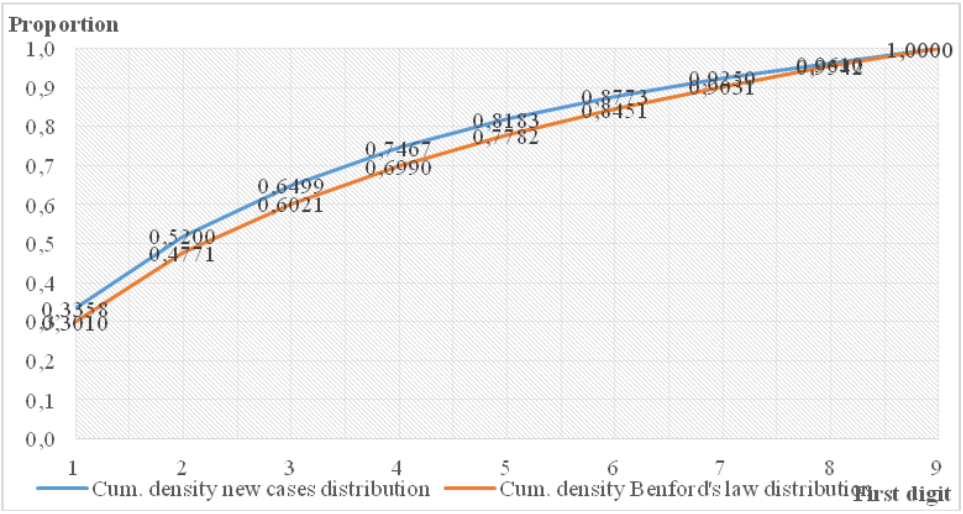

Fig. 1A Comparison of the first digit cumulative density distribution of COVID-19 new cases and the cumulative density Benford's Law distribution

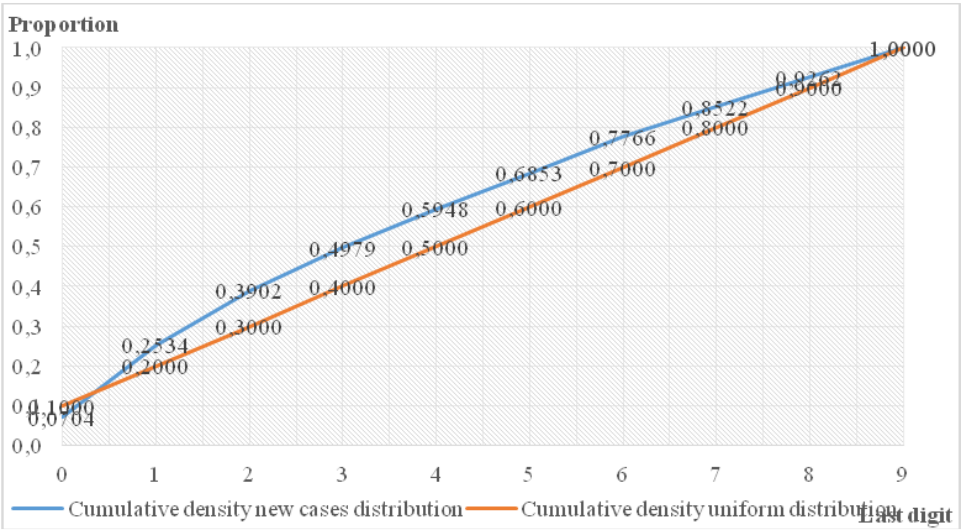

Fig. 2A Comparison of the last digit cumulative density distribution of COVID-19 new cases and the uniform distribution

Table A1 Results of the chi-square and Kolmogorov-Smirnov Z tests for the first and last digit, 206 countries and self-government dependencies

		First digit chi-square test			First digit Kolmogorov-Smirnov Z test			Last digit chi-square test			Last digit Kolmogorov-Smirnov Z test		
Country	Continent	Empirical chi-square	p-value	Decision	Kolmogorov-Smirnov Z empirical (D)	Kolmogorov -Smirnov Z theoretical	Decision	Empirical chi-square	p-value	Decision	Kolmogorov -Smirnov Z empirical (D)	Kolmogorov -Smirnov Z theoretical	Decision
Afghanistan	Asia	15.90	0.04	H1	0.16	0.22	H0	5.16	0.82	H0	0.09	0.22	H0
Albania	Europe	16.18	0.04	H1	0.23	0.20	H1	4.56	0.87	H0	0.06	0.20	H0
Algeria	Africa	12.99	0.11	H0	0.13	0.20	H0	9.92	0.36	H0	0.09	0.20	H0
Andorra	Europe	7.91	0.44	H0	0.13	0.22	H0	12.00	0.21	H0	0.09	0.22	H0
Angola	Africa	4.91	0.77	H0	0.25	0.41	H0	20.82	0.01	H1	0.43	0.41	H1
Anguilla	America	2.50	0.96	H0	0.52	0.96	H0	8.00	0.53	H0	0.70	0.96	H0
Antigua and Barbuda	America	8.82	0.36	H0	0.19	0.45	H0	18.78	0.03	H1	0.39	0.45	H0
Argentina	America	23.08	0.00	H1	0.19	0.20	H0	6.78	0.66	H0	0.12	0.20	H0
Armenia	Europe	23.79	0.00	H1	0.18	0.21	H0	11.19	0.26	H0	0.14	0.21	H0
Aruba	America	8.28	0.41	H0	0.16	0.29	H0	18.00	0.04	H1	0.22	0.29	H0
Australia	Oceania	3.86	0.87	H0	0.08	0.16	H0	27.09	0.00	H1	0.22	0.16	H1
Austria	Europe	11.84	0.16	H0	0.13	0.18	H0	6.33	0.71	H0	0.09	0.18	H0
Azerbaijan	Europe	15.17	0.06	H0	0.15	0.21	H0	2.81	0.97	H0	0.04	0.21	H0
Bahamas	America	13.22	0.10	H0	0.23	0.26	H0	44.86	0.00	H1	0.43	0.26	H1
Bahrain	Asia	4.07	0.85	H0	0.06	0.18	H0	5.55	0.78	H0	0.07	0.18	H0
Bangladesh	Asia	11.34	0.18	H0	0.15	0.23	H0	10.71	0.30	H0	0.08	0.23	H0
Barbados	America	4.54	0.81	H0	0.13	0.28	H0	33.96	0.00	H1	0.30	0.28	H1
Belarus	Europe	11.01	0.20	H0	0.11	0.23	H0	8.71	0.46	H0	0.06	0.23	H0
Belgium	Europe	22.18	0.00	H1	0.25	0.18	H1	7.48	0.59	H0	0.07	0.18	H0
Belize	America	12.42	0.13	H0	0.45	0.39	H1	58.00	0.00	H1	0.55	0.39	H1
Benin	Africa	3.51	0.90	H0	0.15	0.38	H0	7.77	0.56	H0	0.25	0.38	H0
Bermuda	America	12.68	0.12	H0	0.19	0.32	H0	22.00	0.01	H1	0.23	0.32	H0
Bhutan	Asia	16.25	0.04	H1	0.70	0.51	H1	63.00	0.00	H1	0.80	0.51	H1
Bolivia	America	8.54	0.38	H0	0.07	0.21	H0	23.00	0.01	H1	0.13	0.21	H0
Bonaire, Saint Eustatius and Saba	America	6.77	0.56	H0	0.52	0.61	H0	29.00	0.00	H1	0.70	0.61	H1
Bosnia and Herzegovina	Europe	17.99	0.02	H1	0.19	0.22	H0	3.05	0.96	H0	0.05	0.22	H0
Botswana	Africa	4.50	0.81	H0	0.15	0.48	H0	12.00	0.21	H0	0.35	0.48	H0
Brazil	America	9.16	0.33	H0	0.18	0.19	H0	8.40	0.49	H0	0.08	0.19	H0
British Virgin Islands	America	4.89	0.77	H0	0.52	0.68	H0	21.00	0.01	H1	0.70	0.68	H1

Brunei Darussalam	Asia	9.52	0.30	H0	0.15	0.26	H0	20.57	0.01	H1	0.33	0.26	H1
Bulgaria	Europe	16.01	0.04	H1	0.26	0.20	H1	10.33	0.32	H0	0.07	0.20	H0
Burkina Faso	Africa	4.17	0.84	H0	0.15	0.23	H0	5.86	0.75	H0	0.06	0.23	H0
Burundi	Africa	4.73	0.79	H0	0.32	0.61	H0	13.00	0.16	H0	0.50	0.61	H0
Cambodia	Asia	12.34	0.14	H0	0.22	0.27	H0	44.77	0.00	H1	0.40	0.27	H1
Cameroon	Africa	6.54	0.59	H0	0.14	0.26	H0	18.56	0.03	H1	0.13	0.26	H0
Canada	America	41.35	0.00	H1	0.34	0.17	H1	13.39	0.15	H0	0.10	0.17	H0
Cape Verde	Africa	7.79	0.45	H0	0.26	0.35	H0	37.67	0.00	H1	0.43	0.35	H1
Cases on an international conveyance Japan	Other	4.16	0.84	H0	0.14	0.35	H0	4.33	0.89	H0	0.10	0.35	H0
Cayman Islands	America	11.43	0.18	H0	0.13	0.33	H0	13.00	0.16	H0	0.18	0.33	H0
Central African Republic	Africa	13.29	0.10	H0	0.52	0.39	H1	54.67	0.00	H1	0.70	0.39	H1
Chad	Africa	8.22	0.41	H0	0.27	0.36	H0	38.86	0.00	H1	0.41	0.36	H1
Chile	America	21.86	0.01	H1	0.16	0.19	H0	10.40	0.32	H0	0.14	0.19	H0
China	Asia	3.32	0.91	H0	0.03	0.14	H0	7.81	0.55	H0	0.05	0.14	H0
Colombia	America	15.20	0.06	H0	0.11	0.20	H0	14.64	0.10	H0	0.15	0.20	H0
Congo	Africa	6.83	0.56	H0	0.23	0.35	H0	5.67	0.77	H0	0.20	0.35	H0
Costa Rica	America	5.98	0.65	H0	0.15	0.20	H0	14.06	0.12	H0	0.20	0.20	H0
Cote dIvoire	Africa	18.78	0.02	H1	0.17	0.23	H0	5.11	0.82	H0	0.08	0.23	H0
Croatia	Europe	7.77	0.46	H0	0.14	0.18	H0	23.41	0.01	H1	0.17	0.18	H0
Cuba	America	27.60	0.00	H1	0.25	0.22	H1	6.38	0.70	H0	0.08	0.22	H0
Curacao	America	6.80	0.56	H0	0.41	0.45	H0	29.89	0.00	H1	0.60	0.45	H1
Cyprus	Europe	5.16	0.74	H0	0.10	0.21	H0	7.50	0.59	H0	0.13	0.21	H0
Czechia	Europe	8.16	0.42	H0	0.07	0.19	H0	3.38	0.95	H0	0.07	0.19	H0
Democratic Republic of the Congo	Africa	9.47	0.30	H0	0.19	0.25	H0	15.33	0.08	H0	0.17	0.25	H0
Denmark	Europe	17.41	0.03	H1	0.22	0.18	H1	14.36	0.11	H0	0.19	0.18	H1
Djibouti	Africa	3.67	0.89	H0	0.10	0.26	H0	6.70	0.67	H0	0.07	0.26	H0
Dominica	America	5.96	0.65	H0	0.32	0.48	H0	27.00	0.00	H1	0.45	0.48	H0
Dominican Republic	America	11.85	0.16	H0	0.11	0.22	H0	13.05	0.16	H0	0.11	0.22	H0
Ecuador	America	8.93	0.35	H0	0.08	0.19	H0	14.88	0.09	H0	0.10	0.19	H0
Egypt	Africa	10.66	0.22	H0	0.17	0.20	H0	5.98	0.74	H0	0.07	0.20	H0
El Salvador	America	7.74	0.46	H0	0.12	0.26	H0	5.96	0.74	H0	0.13	0.26	H0
Equatorial Guinea	Africa	10.02	0.26	H0	0.35	0.33	H1	27.12	0.00	H1	0.48	0.33	H1
Eritrea	Africa	4.42	0.82	H0	0.15	0.38	H0	12.38	0.19	H0	0.35	0.38	H0
Estonia	Europe	20.52	0.01	H1	0.10	0.20	H0	12.42	0.19	H0	0.10	0.20	H0
Eswatini	Africa	9.26	0.32	H0	0.32	0.38	H0	24.69	0.00	H1	0.52	0.38	H1
Ethiopia	Africa	6.88	0.55	H0	0.10	0.24	H0	20.50	0.02	H1	0.25	0.24	H1
Falkland Islands (Malvinas)	America	5.57	0.70	H0	0.30	0.61	H0	17.00	0.05	H1	0.40	0.61	H0
Faroe Islands	Europe	9.69	0.29	H0	0.10	0.30	H0	18.00	0.04	H1	0.35	0.30	H1

Fiji	Oceania	13.37	0.10	H0	0.45	0.39	H1	59.67	0.00	H1	0.62	0.39	H1
Finland	Europe	20.63	0.01	H1	0.15	0.19	H0	9.20	0.42	H0	0.09	0.19	H0
France	Europe	13.45	0.10	H0	0.14	0.17	H0	11.31	0.25	H0	0.08	0.17	H0
French Polynesia	Oceania	6.29	0.61	H0	0.22	0.30	H0	35.00	0.00	H1	0.40	0.30	H1
Gabon	Africa	11.66	0.17	H0	0.21	0.30	H0	17.57	0.04	H1	0.31	0.30	H1
Gambia	Africa	9.95	0.27	H0	0.53	0.55	H0	37.33	0.00	H1	0.63	0.55	H1
Georgia	Europe	16.10	0.04	H1	0.16	0.20	H0	16.17	0.06	H0	0.13	0.20	H0
Germany	Europe	12.55	0.13	H0	0.13	0.16	H0	9.94	0.36	H0	0.13	0.16	H0
Ghana	Africa	4.46	0.81	H0	0.10	0.26	H0	9.86	0.36	H0	0.19	0.26	H0
Gibraltar	Europe	4.54	0.81	H0	0.10	0.30	H0	4.00	0.91	H0	0.10	0.30	H0
Greece	Europe	23.41	0.00	H1	0.13	0.19	H0	11.85	0.22	H0	0.12	0.19	H0
Greenland	America	4.98	0.76	H0	0.40	0.51	H0	23.00	0.01	H1	0.60	0.51	H1
Grenada	America	6.71	0.57	H0	0.38	0.51	H0	20.14	0.02	H1	0.56	0.51	H1
Guam	Oceania	4.68	0.79	H0	0.06	0.25	H0	16.17	0.06	H0	0.19	0.25	H0
Guatemala	America	3.28	0.92	H0	0.13	0.22	H0	22.73	0.01	H1	0.19	0.22	H0
Guernsey	Europe	7.66	0.47	H0	0.14	0.26	H0	6.70	0.67	H0	0.10	0.26	H0
Guinea	Africa	3.70	0.88	H0	0.06	0.27	H0	5.00	0.83	H0	0.14	0.27	H0
Guinea Bissau	Africa	8.08	0.43	H0	0.17	0.38	H0	13.92	0.13	H0	0.30	0.38	H0
Guyana	America	3.50	0.90	H0	0.10	0.29	H0	18.00	0.04	H1	0.27	0.29	H0
Haiti	America	9.66	0.29	H0	0.26	0.29	H0	30.73	0.00	H1	0.46	0.29	H1
Holy See	Europe	9.56	0.30	H0	0.53	0.55	H0	37.33	0.00	H1	0.63	0.55	H1
Honduras	America	8.42	0.39	H0	0.15	0.21	H0	7.50	0.59	H0	0.10	0.21	H0
Hungary	Europe	8.08	0.43	H0	0.10	0.20	H0	10.33	0.32	H0	0.12	0.20	H0
Iceland	Europe	7.69	0.46	H0	0.16	0.19	H0	10.58	0.31	H0	0.10	0.19	H0
India	Asia	7.00	0.54	H0	0.09	0.18	H0	7.11	0.63	H0	0.14	0.18	H0
Indonesia	Asia	17.15	0.03	H1	0.29	0.20	H1	6.78	0.66	H0	0.08	0.20	H0
Iran	Asia	25.15	0.00	H1	0.25	0.17	H1	11.13	0.27	H0	0.13	0.17	H0
Iraq	Asia	5.98	0.65	H0	0.10	0.20	H0	5.75	0.76	H0	0.07	0.20	H0
Ireland	Europe	7.13	0.52	H0	0.10	0.19	H0	11.94	0.22	H0	0.09	0.19	H0
Isle of Man	Europe	10.03	0.26	H0	0.22	0.25	H0	18.24	0.03	H1	0.36	0.25	H1
Israel	Asia	18.00	0.02	H1	0.14	0.18	H0	9.33	0.41	H0	0.13	0.18	H0
Italy	Europe	37.73	0.00	H1	0.24	0.17	H1	13.98	0.12	H0	0.09	0.17	H0
Jamaica	America	16.32	0.04	H1	0.21	0.23	H0	20.71	0.01	H1	0.32	0.23	H1
Japan	Asia	11.74	0.16	H0	0.13	0.15	H0	3.54	0.94	H0	0.04	0.15	H0
Jersey	Europe	2.32	0.97	H0	0.07	0.28	H0	5.26	0.81	H0	0.14	0.28	H0
Jordan	Asia	9.59	0.30	H0	0.08	0.23	H0	14.00	0.12	H0	0.11	0.23	H0
Kazakhstan	Asia	8.79	0.36	H0	0.17	0.22	H0	8.44	0.49	H0	0.09	0.22	H0
Kenya	Africa	10.48	0.23	H0	0.15	0.24	H0	10.94	0.28	H0	0.10	0.24	H0
Kosovo	Europe	13.53	0.09	H0	0.12	0.24	H0	9.12	0.43	H0	0.05	0.24	H0
Kuwait	Asia	9.86	0.28	H0	0.12	0.18	H0	5.91	0.75	H0	0.13	0.18	H0

Kyrgyzstan	Asia	7.61	0.47	H0	0.20	0.25	H0	14.00	0.12	H0	0.13	0.25	H0
Laos	Asia	4.81	0.78	H0	0.30	0.43	H0	24.00	0.00	H1	0.50	0.43	H1
Latvia	Europe	8.64	0.37	H0	0.12	0.20	H0	10.23	0.33	H0	0.10	0.20	H0
Lebanon	Asia	4.80	0.78	H0	0.11	0.19	H0	14.47	0.11	H0	0.09	0.19	H0
Liberia	Africa	6.73	0.57	H0	0.19	0.31	H0	14.16	0.12	H0	0.28	0.31	H0
Libya	Africa	7.15	0.52	H0	0.19	0.35	H0	21.67	0.01	H1	0.33	0.35	H0
Liechtenstein	Europe	9.37	0.31	H0	0.22	0.28	H0	34.33	0.00	H1	0.38	0.28	H1
Lithuania	Europe	19.20	0.01	H1	0.23	0.21	H1	9.50	0.39	H0	0.13	0.21	H0
Luxembourg	Europe	9.44	0.31	H0	0.17	0.20	H0	4.11	0.90	H0	0.07	0.20	H0
Madagascar	Africa	8.61	0.38	H0	0.23	0.28	H0	8.50	0.48	H0	0.10	0.28	H0
Malawi	Africa	12.66	0.12	H0	0.31	0.41	H0	37.18	0.00	H1	0.51	0.41	H1
Malaysia	Asia	29.03	0.00	H1	0.29	0.17	H1	16.42	0.06	H0	0.20	0.17	H1
Maldives	Asia	11.63	0.17	H0	0.31	0.31	H1	28.89	0.00	H1	0.33	0.31	H1
Mali	Africa	9.07	0.34	H0	0.10	0.27	H0	9.00	0.44	H0	0.08	0.27	H0
Malta	Europe	5.41	0.71	H0	0.10	0.20	H0	6.33	0.71	H0	0.11	0.20	H0
Mauritania	Africa	8.79	0.36	H0	0.53	0.55	H0	37.33	0.00	H1	0.70	0.55	H1
Mauritius	Africa	6.95	0.54	H0	0.13	0.26	H0	9.14	0.42	H0	0.08	0.26	H0
Mexico	America	6.66	0.57	H0	0.12	0.20	H0	13.21	0.15	H0	0.15	0.20	H0
Moldova	Europe	13.12	0.11	H0	0.21	0.20	H1	22.33	0.01	H1	0.19	0.20	H0
Monaco	Europe	8.91	0.35	H0	0.13	0.25	H0	23.33	0.01	H1	0.30	0.25	H1
Mongolia	Asia	14.53	0.07	H0	0.43	0.35	H1	57.67	0.00	H1	0.50	0.35	H1
Montenegro	Europe	7.48	0.49	H0	0.13	0.23	H0	3.57	0.94	H0	0.06	0.23	H0
Montserrat	America	2.46	0.96	H0	0.30	0.61	H0	9.00	0.44	H0	0.50	0.61	H0
Morocco	Africa	24.34	0.00	H1	0.20	0.20	H0	21.45	0.01	H1	0.21	0.20	H1
Mozambique	Africa	3.75	0.88	H0	0.18	0.34	H0	22.75	0.01	H1	0.38	0.34	H1
Myanmar	Asia	3.53	0.90	H0	0.13	0.28	H0	20.91	0.01	H1	0.30	0.28	H1
Namibia	Africa	4.42	0.82	H0	0.30	0.48	H0	17.00	0.05	H1	0.50	0.48	H1
Nepal	Asia	8.99	0.34	H0	0.40	0.38	H1	29.31	0.00	H1	0.52	0.38	H1
Netherlands	Europe	21.73	0.01	H1	0.15	0.18	H0	7.93	0.54	H0	0.09	0.18	H0
New Caledonia	Oceania	11.50	0.17	H0	0.41	0.45	H0	29.89	0.00	H1	0.59	0.45	H1
New Zealand	Oceania	7.77	0.46	H0	0.09	0.21	H0	8.00	0.53	H0	0.09	0.21	H0
Nicaragua	America	9.79	0.28	H0	0.52	0.48	H1	42.00	0.00	H1	0.70	0.48	H1
Niger	Africa	8.71	0.37	H0	0.10	0.27	H0	7.40	0.60	H0	0.08	0.27	H0
Nigeria	Africa	2.73	0.95	H0	0.09	0.23	H0	6.78	0.66	H0	0.13	0.23	H0
North Macedonia	Europe	13.13	0.11	H0	0.11	0.21	H0	17.78	0.04	H1	0.16	0.21	H0
Northern Mariana Islands	Oceania	6.13	0.63	H0	0.30	0.55	H0	14.00	0.12	H0	0.50	0.55	H0
Norway	Europe	12.11	0.15	H0	0.14	0.18	H0	7.73	0.56	H0	0.13	0.18	H0
Oman	Asia	11.13	0.19	H0	0.21	0.21	H0	18.76	0.03	H1	0.19	0.21	H0
Pakistan	Asia	7.33	0.50	H0	0.14	0.21	H0	4.67	0.86	H0	0.10	0.21	H0
Palestine	Asia	17.40	0.03	H1	0.14	0.22	H0	19.72	0.02	H1	0.11	0.22	H0
Panama	America	16.16	0.04	H1	0.20	0.20	H0	7.82	0.55	H0	0.11	0.20	H0

Papua New Guinea	Oceania	6.63	0.58	H0	0.45	0.68	H0	21.00	0.01	H1	0.55	0.68	H0
Paraguay	America	12.91	0.11	H0	0.11	0.23	H0	20.11	0.02	H1	0.23	0.23	H1
Peru	America	16.02	0.04	H1	0.08	0.20	H0	24.00	0.00	H1	0.11	0.20	H0
Philippines	Asia	13.12	0.11	H0	0.18	0.20	H0	10.96	0.28	H0	0.18	0.20	H0
Poland	Europe	11.43	0.18	H0	0.10	0.19	H0	6.71	0.67	H0	0.11	0.19	H0
Portugal	Europe	18.73	0.02	H1	0.26	0.19	H1	6.08	0.73	H0	0.07	0.19	H0
Puerto Rico	America	32.69	0.00	H1	0.28	0.27	H1	4.00	0.91	H0	0.05	0.27	H0
Qatar	Asia	8.89	0.35	H0	0.10	0.19	H0	7.94	0.54	H0	0.06	0.19	H0
Romania	Europe	17.75	0.02	H1	0.20	0.19	H1	9.92	0.36	H0	0.16	0.19	H0
Russia	Europe	12.45	0.13	H0	0.11	0.20	H0	7.48	0.59	H0	0.10	0.20	H0
Rwanda	Africa	4.08	0.85	H0	0.07	0.24	H0	10.94	0.28	H0	0.17	0.24	H0
Saint Kitts and Nevis	America	8.21	0.41	H0	0.41	0.45	H0	36.56	0.00	H1	0.59	0.45	H1
Saint Lucia	America	4.68	0.79	H0	0.27	0.51	H0	20.14	0.02	H1	0.41	0.51	H0
Saint Vincent and the Grenadines	America	6.68	0.57	H0	0.37	0.55	H0	24.00	0.00	H1	0.47	0.55	H0
San Marino	Europe	5.92	0.66	H0	0.10	0.20	H0	13.21	0.15	H0	0.11	0.20	H0
Sao Tome and Principe	Africa	7.16	0.52	H0	0.48	0.96	H0	8.00	0.53	H0	0.50	0.96	H0
Saudi Arabia	Asia	7.20	0.52	H0	0.15	0.20	H0	14.87	0.09	H0	0.11	0.20	H0
Senegal	Africa	9.51	0.30	H0	0.20	0.20	H0	15.55	0.08	H0	0.20	0.20	H0
Serbia	Europe	10.56	0.23	H0	0.12	0.20	H0	13.27	0.15	H0	0.13	0.20	H0
Seychelles	Africa	8.77	0.36	H0	0.52	0.48	H1	34.50	0.00	H1	0.70	0.48	H1
Sierra Leone	Africa	6.78	0.56	H0	0.27	0.34	H0	32.75	0.00	H1	0.45	0.34	H1
Singapore	Asia	6.89	0.55	H0	0.09	0.15	H0	27.19	0.00	H1	0.18	0.15	H1
Sint Maarten	America	7.47	0.49	H0	0.17	0.35	H0	12.33	0.20	H0	0.27	0.35	H0
Slovakia	Europe	12.81	0.12	H0	0.19	0.20	H0	9.89	0.36	H0	0.12	0.20	H0
Slovenia	Europe	31.43	0.00	H1	0.18	0.19	H0	6.71	0.67	H0	0.10	0.19	H0
Somalia	Africa	5.12	0.74	H0	0.18	0.34	H0	11.50	0.24	H0	0.15	0.34	H0
South Africa	Africa	6.49	0.59	H0	0.08	0.20	H0	5.74	0.77	H0	0.07	0.20	H0
South Korea	Asia	7.43	0.49	H0	0.07	0.15	H0	11.75	0.23	H0	0.08	0.15	H0
South Sudan	Africa	9.29	0.32	H0	0.70	0.68	H1	36.00	0.00	H1	0.80	0.68	H1
Spain	Europe	20.29	0.01	H1	0.25	0.17	H1	6.70	0.67	H0	0.08	0.17	H0
Sri Lanka	Asia	5.63	0.69	H0	0.08	0.21	H0	8.50	0.48	H0	0.13	0.21	H0
Sudan	Africa	8.99	0.34	H0	0.34	0.33	H1	18.88	0.03	H1	0.38	0.33	H1
Suriname	America	4.26	0.83	H0	0.32	0.61	H0	13.00	0.16	H0	0.50	0.61	H0
Sweden	Europe	8.27	0.41	H0	0.08	0.18	H0	10.62	0.30	H0	0.08	0.18	H0
Switzerland	Europe	4.72	0.79	H0	0.13	0.18	H0	11.50	0.24	H0	0.10	0.18	H0
Syria	Asia	12.95	0.11	H0	0.23	0.39	H0	16.33	0.06	H0	0.30	0.39	H0
Taiwan	Asia	21.34	0.01	H1	0.26	0.18	H1	51.33	0.00	H1	0.32	0.18	H1
Thailand	Asia	10.94	0.21	H0	0.18	0.18	H0	19.73	0.02	H1	0.20	0.18	H1
Timor Leste	Asia	6.22	0.62	H0	0.40	0.48	H0	24.50	0.00	H1	0.60	0.48	H1

Togo	Africa	4.24	0.83	H0	0.13	0.27	H0	22.46	0.01	H1	0.31	0.27	H1
Trinidad and Tobago	America	4.54	0.81	H0	0.16	0.25	H0	38.24	0.00	H1	0.39	0.25	H1
Tunisia	Africa	14.33	0.07	H0	0.15	0.21	H0	11.44	0.25	H0	0.20	0.21	H0
Turkey	Asia	24.98	0.00	H1	0.20	0.21	H0	12.41	0.19	H0	0.08	0.21	H0
Turks and Caicos islands	America	9.44	0.31	H0	0.41	0.51	H0	34.43	0.00	H1	0.60	0.51	H1
Uganda	Africa	7.19	0.52	H0	0.23	0.35	H0	27.00	0.00	H1	0.33	0.35	H0
Ukraine	Europe	9.07	0.34	H0	0.07	0.22	H0	4.33	0.89	H0	0.05	0.22	H0
United Arab Emirates	Asia	12.30	0.14	H0	0.15	0.20	H0	14.49	0.11	H0	0.24	0.20	H1
United Kingdom	Europe	36.71	0.00	H1	0.18	0.17	H1	7.35	0.60	H0	0.11	0.17	H0
United Republic of Tanzania	Africa	4.86	0.77	H0	0.11	0.29	H0	28.00	0.00	H1	0.25	0.29	H0
United States of America	America	20.24	0.01	H1	0.21	0.16	H1	28.01	0.00	H1	0.14	0.16	H0
United States Virgin Islands	America	4.87	0.77	H0	0.15	0.39	H0	11.33	0.25	H0	0.27	0.39	H0
Uruguay	America	14.34	0.07	H0	0.11	0.22	H0	12.54	0.18	H0	0.16	0.22	H0
Uzbekistan	Asia	5.08	0.75	H0	0.05	0.22	H0	3.27	0.95	H0	0.04	0.22	H0
Venezuela	America	9.47	0.30	H0	0.08	0.26	H0	5.96	0.74	H0	0.08	0.26	H0
Vietnam	Asia	16.64	0.03	H1	0.12	0.19	H0	60.59	0.00	H1	0.28	0.19	H1
Yemen	Asia	2.32	0.97	H0	0.70	1.36	H0	9.00	0.44	H0	0.80	1.36	H0
Zambia	Africa	4.88	0.77	H0	0.09	0.31	H0	15.21	0.09	H0	0.29	0.31	H0
Zimbabwe	Africa	10.25	0.25	H0	0.33	0.35	H0	48.33	0.00	H1	0.53	0.35	H1

Source: Authors' calculations

* Cases on an international conveyance Japan – related to COVID-19 cases on the cruise ship Princess Diamond

* Guernsey, Isle of Man, Jersey are self-governing dependencies of the United Kingdom

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EFFECTUATION AND CAUSATION DECISION MAKING LOGICS OF MANAGING UNCERTAINTY AND COMPETITIVENESS BY NIGERIAN RETAIL BUSINESS ENTREPRENEURS

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Abstract. *Uncertainty is a major dimension of business that alters business plans and courses of actions. Hence, this study primarily examined how entrepreneurs deal with uncertainty using both effectual and causal logics. The study design was cross-sectional while multistage sampling technique was used to collect primary data. These data were analysed using bivariate correlation and hierarchical regression techniques of SPSS version 23. The results of the correlation analysis showed that causation and three of the four sub-dimensions of effectuation had significant relation with competitiveness while pre-commitment did not. The analysis further showed that Nigerian retail entrepreneurs tended more towards causation and effectuation. The results from the hierarchical regression revealed that causation made the most unique impact on competitiveness and was closely followed by experimentation and flexibility. However, affordable loss and pre-commitment did not. This study contributed to knowledge by empirically showing that entrepreneurs will not always be more effectual oriented in all cases. It also confirmed that causation and effectuation should be seen as complementary and not exclusive strategies.*

Key words: *effectuation, causation, competitiveness, retail business, Nigerian entrepreneurs, uncertainty.*

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1. INTRODUCTION

Uncertainty is a major dimension of business environment causing sleeplessness for business entrepreneurs and other decision makers. It often interrupts plans and changes course of actions for businesses. It also presents opportunities and threats (Laine & Galkina, 2016) that can alter market positions of leaders, challengers, and followers. Brettel, Mauer, Engelen and Kupper (2012) defined uncertainty in terms of the variance between the information possessed by an organisation and those it required to execute a particular task, i.e. predicting future events is not possible by means of probability distribution (Frese, Geiger & Dost, 2019). By means of probability distribution, Alvarez and Barney (2005) clearly differentiated risk from uncertainty. Under risk taking, all possible outcomes of a decision to exploit a market opportunity as well as the probability of the outcomes occurring are known at the time of taking the decision. However, under condition of uncertainty, both the possible outcomes and the probability of each outcome occurring are not known as at the time of making the decision. This according to Eijdenberg, Paas and Masurel (2017) is due to the hostility, dynamism, and heterogeneity of a firm's industry which react to economic and socio-political conditions of a country and the global environment. Uncertainty can vary from high degree to low degree depending on the nature of unanticipated events and the way these degrees are approached for a successful performance has gained the attention of scholars and practitioners of business.

Traditionally, uncertainty has been managed by rational decision-making logic also known as causation logic, an orientation that focuses on the goal (or effect) the decision maker wants to achieve and subsequently determining the means or resources necessary to achieve the goals (Henninger, Brem, Giones, Bican, & Wimschneider, 2020). The causal entrepreneur views the future as a continuation of the past that can be predicted and unpredictability as a function of ignorance, inadequate tools and techniques, or statistical anomalies arising from exogenous shocks and irrationality of agents among others. Therefore, entrepreneurs or decision makers should focus on how to overcome or avoid these contingencies through better planning (Dew, Sarasvathy, Read, & Wiltbank, 2008). Causation orientation further assumes that the task of an entrepreneur is to be alert in discovering and exploiting opportunities in uncertain conditions (Read, Song & Smit, 2009). To achieve these, decision makers engage in collecting data on consumer preferences, analysing competitors' successes and failure, and applying various strategic and financial tools to reduce uncertainty so as to be able to assemble and coordinate the resources required to exploit the identified market opportunities (Alvarez & Barney, 2005).

A new approach to managing uncertainty, effectuation theory, came to limelight as an alternative to the existing traditional decision model, causation (Dias, Iizuka & Boas, 2019). It is an orientation that assumes that entrepreneurs do not necessarily wait to discover opportunities but can create them through their relationship with their stakeholders (Read et al., 2009). Since the concept emerged in academic discourse, studies have been conducted on how effectuation and causation logics can be adopted to deal with uncertainties in business environment. Effectuation encourages entrepreneurs to deal with the challenges of uncertainty by engaging their business partners with their available means and hoping to create opportunities that the firms can eventually exploit (Dias et al., 2019). They put more efforts at innovation and novelty which make them less dependent on valid information needed ahead of time to enhance business operations and also making it more difficult for competitors to pre-empt their next actions (Gregoire & Cherchem, 2019). In this way, they do not need to predict the future but control it through their actions in the industry.

There are several claims in the literature on which of causation and effectuation is more superior; yields better performance; or if both can be applied simultaneously to yield better results (Eyana, Masurel, & Paas, 2018). However, none of the studies that examined these claims have done so within the context of retail businesses in Nigeria (Eijdenberg et al., 2017; Eyana, et al., 2018; Frese et al., 2019; Henninger, et al., 2020; McKelvie, Detienne, & Chandler, 2013). Therefore, this study identifies this gap and intends to examine how Nigerian retail business entrepreneurs use effectuation and causation logics during uncertainty to maintain competitiveness.

The remaining of the study will be divided into the following headings: literature review, methodology, statistical analysis/results, discussion and conclusion, and contribution to knowledge.

2. Literature Review

2.1. Theoretical Framework and Hypotheses Development

2.1.1. Sarasvathy (2001) Theory of Effectuation

Sarasvathy (2001) developed a theory that best explains entrepreneurial behaviour during uncertainty. According to her, entrepreneurs are more likely to use effectual logic of decision making in uncertain context to control the future instead of predicting it. In this situation, the future is not clear and unpredictable. The entrepreneur sails these troubled waters with his available resources hoping to get a clearer direction as he sails further. She termed this approach "means based" instead of the usual traditional model of defining what is to be achieved before committing resources which Sarasvathy termed, "goal driven" approach. Also, an effectual entrepreneur is more guided by how much he can afford to lose by committing available resources to a project instead of the causal logic of how much is expected in gain. She termed this approach, "affordable loss versus expected return orientation". Furthermore, an effectual entrepreneur relies on relationship with stakeholders like customers, suppliers and even competitors through "pre-commitment instead of the causal logic of competitive analysis". Lastly, an effectual entrepreneur leverages on environmental contingencies by being "flexible instead of exploiting pre-existing knowledge".

Put differently, effectuation and causation according to early researchers are opposing strategies, mutually exclusive, and inverted. Read and Sarasvathy (2005) clearly dichotomised the two concepts in these ways: Causation operates on the logic of "if the future can be predicted then it can be controlled" while effectuation operates on the logic of "if the future can be controlled, then there is no need to predict it"; causation is driven by goals while effectuation is driven by means; causation is reactional and adaptive while effectuation is enactive and exaptive; causation sees environment as exogenous and outside the control of decision makers while effectuation sees environment as endogenous to decision makers who seek to control it by making pre-commitment with stakeholders like customers, suppliers, competitors, etc. However, more recent scholarly works discovered that effectuation and causation seem to be complementary, rather than exclusive (Frese et al., 2019; Laine & Galkina, 2017). This study will also examine the relevance of this discovery within the Nigerian context.

Chandler et al (2011) advanced Sarasvathy theory by providing a framework that allows empirical study to be carried out using quantitative primary data. Effectual logic was treated as a latent variable that can be measured using four constructs which are experimentation,

flexibility, affordable loss, and pre-commitment, while causation was treated as a unidimensional construct. This study adopts this framework and develops two central hypotheses that will be tested using primary data that will be collected from Nigerian retail business entrepreneurs. In the first hypothesis, the four constructs of effectuation will be measured on competitiveness while in the second hypothesis, causation is measured as a single construct on competitiveness as shown below:

H_1: There is a significant positive relationship between effectual logic a) experimentation b) affordable loss c) flexibility d) pre-commitment and competitiveness during high uncertainty by Nigerian retail business entrepreneurs.

H_2: There is a significant positive relationship between causal logic and competitiveness during high uncertainty by Nigerian retail business entrepreneurs.

2.2. Empirical Review of Literature

Empirical studies have been conducted on these concepts. However, most were based on experiment and use of qualitative data while only a few studies have used quantitative primary data (Eyana, et al., 2018). The first quantitative assessment of the concept of effectuation was carried out eight years after Sarasvathy initially delineated the concept in 2001 and subsequent follow up by other various qualitative studies (Brettel et al., 2012).

For example, Chandler, DeTienne, McKelvie and Mumford (2011) carried out a study with an objective to develop sound quantitative Likert- type measures that promote empirical research on causation and effectuation constructs in new venture creation. The study employed semi-structured interview on entrepreneurs in the sampling frame. The findings revealed causation as a unidimensional construct and effectuation as a multidimensional construct that include experimentation, affordable loss, flexibility and pre-commitments. The study showed a negative association between causation and uncertainty, and a positive correlation between experimentation, a sub-dimension of effectuation and uncertainty. In another instance, Brettel, et al. (2012) conducted a study that investigated how effectuation and causation practices affect R&D project performance. Two central hypotheses were formulated to test if effectuation is positively related to success in highly innovative context or if causation approach is beneficial in projects with low innovativeness. Many of the results from the analyses of the sub-hypotheses supported the two central hypotheses with a few showing otherwise.

Furthermore, McKelvie, et al., (2013) theoretically and empirically examined the appropriate dependent variable in effectuation research with an aim to address the divergent views, lack of evidence and limited guidance on appropriate short-and-long term measure of effectuation performance outcomes. The regression analysis showed a pattern of mixed results for effectuation and causation. The implication for research is that decision making under uncertainty using effectuation theory must theoretically identify an important dependent variable. Also, Laine and Galkina (2016) explored the interplay between effectuation and causation in Russian SMEs' decision making on their foreign suppliers under regulatory shifts and increased institutional uncertainty. Their aim was to compensate the research deficiencies on changing from one logic to another, the paradoxical interplay and dynamics of causation and effectuation over time. The study adopted longitudinal multiple-case study method and the analysis of data collected revealed that the firms use both effectuation and causation decision making logic simultaneously but more of effectuation during increased institutional uncertainty.

Another study by Eijdenberg et al. (2017) further investigated how effectuation and causation orientation of small business owners in an emerging country Burundi affect

their decision-making and growth of their businesses in an environment of uncertainty. Hypotheses were developed and tested to determine which of effectuation and causation orientation drives entrepreneurs more during uncertainty. The result from the analyses revealed that small business owners lean more towards effectuation than causation but neither affected small business growth later. The gap for future consideration is to explore other determinants of small business growth in uncertain context. In addition, Eyana, et al. (2018) examined the effects of causation and effectuation behaviour of Ethiopian entrepreneurs on performance of their new small tourism firms. The study developed and tested two hypotheses on causation and the four dimensions of effectuation also controlled for certain variables to predict firm performance. While the result of hypothesis one showed that causation has more positive impact on employment size than effectuation, the results of the analysis of hypothesis two showed varying effects of the four dimensions of effectuation on firm financial performance with more of the dimensions confirming that effectuation positively affects firm performance more than causation. In contributing to knowledge, the study did not find strong evidence to support the claim that effectuation is superior to causation in a non-Western context.

Subsequently, Gregoire and Cherchem (2019) did a content analysis of 101 effectuation articles between 1998 and 2016 with the specific goal of identifying series of theoretical and methodological challenges of effectuation research. They observed through the literature that the difficultiy in building on prior studies is because so many of the studies on effectuation used different conceptions, data, and methods of observation. Based on these findings, they proposed three ways of advancing effectuation research. The first is to adopt a conceptual articulation of the mode of action for effectuation. Second is to define a new means for observing effectuation and its manifestations. Third is giving more elaborate explanations on the reasons for the antecedents and consequences effectuation has. At that same time, Frese et al. (2019) empirically investigated the determinants of effectuation and causal decision logics in online and high-tech start-up firms to address scholarly concerns about "effectuation research being insufficiently embedded in a nomological network of practically relevant antecedents". To address the above concern, the study used qualitative method to identify four effectuation antecedents which are founder's perceived uncertainty, investor influence, management experience, and entrepreneurial experience and validated this finding using quantitative method. The overall results from the qualitative analysis revealed that applying effectual and causal logics look more complementary or partly independent than exclusive; and also, that management experience and investor influence are potential meaningful determinants of effectuation and causation. The results from the quantitative analysis also confirmed what the qualitative analysis reported: that both effectuation and causation are not opposing strategies but rather complementary.

Finally, Henninger, et al. (2020) investigated the use of effectuation in established firms. They observed a pattern in literature that showed that effectuation is often used more in start-ups and causation in established firms. They also found later research that supported the use of effectuation in established firms but how effectuation can be implemented has not been addressed in literature. This formed the focus of their study. They collected data through face-to-face semi-structured in-depth interviews because the instrument is flexible and allows detailed information to be collected as well as follow-up. The data were analysed using qualitative content analysis approach. The result showed that decision making in established firms frequently used more effectuation approach than the causation approach. This unexpected result negates earlier claims that established firms used more of causation approach because of their size.

Within the Nigerian context, the author is not aware of any studies conducted in the retail business sector of the economy using quantitative primary data to examine how entrepreneurs deal with uncertainty using both effectual and causal strategies. This study will employ this method. Furthermore, Eyana, et al (2018) also observed that literature has not been explicit on which of the causation and effectuation decision models yields better effects (performance) but tacitly, the choice of effectuation seems superior in literature tone. Effects according to Henninger et al., (2020) are goals or impacts a decision-maker is pursuing. In this study, effect will be measured as competitiveness because it is the overall motivation for entrepreneurs (Henninger et al., 2020) and without being competitive, it will be difficult to survive and operate in highly uncertain context. In addition, scholars have called for a shift in focus in the advancement of effectuation theory (having evolved from nascent to intermediate stage) by rigorously testing their relationships with other constructs (Frese et al., 2019). This study identifies this gap and intends to use competitiveness as the other construct since it is not aware of any existing work in this area within the Nigerian context. This way the study will also be contributing to knowledge in the advancement of effectuation.

The gap in literature also finds support in McKelvie, et al. (2013) who opined that the impacts effectuation and causation have on firm's performance may be predicated on differing grounds. Hence, this study intends to fill this gap by examining if effectuation and causation strategies are relevant to the competitiveness of Nigerian retail business entrepreneurs during uncertainties. The choice of entrepreneurs for this study is supported by Read and Sarasvathy (2005) who posited that analysing effectuation depends largely on the person being analysed and also based on expertise of entrepreneurs. Entrepreneurs in this context refer to the owners of business (Eijdenberg et al., 2017) that are actively involved in the running of the business. They become a variable of interest for this study because they are in the best position to give the most appropriate response to items in the research instrument (Frese et al., 2019).

2.3. Conceptual Framework

Here the researcher presented a model (as shown in figure 1) that depicts the relationship between the exogenous variables (causation and effectuation) and the endogenous variable (competitiveness) in this study.

3. METHODOLOGY

The study employed cross sectional survey design while the population of the study consists of Retail businesses limited to supermarkets, boutiques and mini-markets that have a staff strength below 50. The choice of retail businesses stems from the fact that it ranked first among the five major economic sectors in Nigeria with 42.3% and closely followed by the agricultural sector with 20.9% (MSMEs, 2017 national survey). The study was limited to Lagos State because it is the commercial hub of the country and has the highest number of enterprises across all sectors of the Nigerian economy (MSMEs, 2017 national survey). Furthermore, many micro and small businesses are in retail forms and according to the MSMEs 2017 report, MSMEs in Nigeria are the bedrock of the economy and contributed 49.78% to the GDP in 2017.

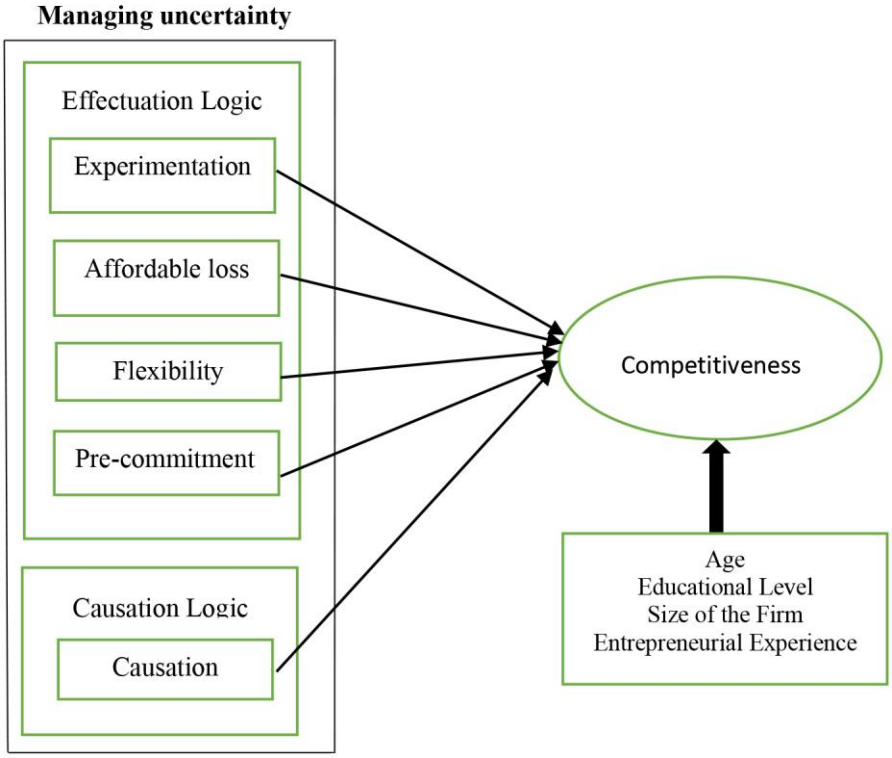

Fig. 1 Conceptual Framework
Source: Researcher 2021

A multi-stage sampling technique was employed with purposive sampling technique adopted initially to select the respondents while the convenient sampling technique was then used to administer the questionnaire. The consent of the respondents was sought and anonymity guaranteed. The response rate was 72% which could be due to the researcher's constant touch during the four weeks' period (September 15, 2020 to October 6, 2020) within which the copies of the questionnaire were administered and filled for return. The response rate fell within recommended threshold of Hair et al. (2010) who recommended 20:1 sample-to-variable ratio for robust factor analysis. This study measured six variables and with 215 respondents. The ratio of 36:1 obtained exceeded the recommended threshold.

The questionnaire survey instrument was divided into sections A, B and C. Section A was used to gather socio-demographic data like gender, age, marital status, educational level, etc. Section B was used to gather data for the independent variables, causation logic and effectuation logic, which were measured by adapting Chandler et al. (2011) five point Likert measuring scales that ranges from strongly disagree (1) to strongly agree (5). Causation logic was measured as a unidimensional construct with seven items while effectuation logic was measured as a multi-dimensional construct with thirteen items. The first, experimentation, was measured with four items. The second, affordable loss, has three items. The third, flexibility, used four items. And the last, pre-commitment, was assessed with two items. Section C was used to gather data for the dependent variable,

competitiveness which was assessed by adapting competitor orientation with a 4-item scale developed by Narver and Slater (1990). The items used a 7 point Likert scale ranging from strongly disagree (1) to strongly agree (7).

Lastly, extraneous variables such as age, educational level, entrepreneurial experience and firm's size that have been confirmed to affect the relationship between the predictor and outcome variables of this study will be controlled for (Eyana et al., 2018).

3.1. Reliability Test

The reliability of the study variables was carried out using Statistical Package for Social Sciences (SPSS) version 23 and the following Cronbach's Alpha standardised values: 0.76, 0.75, 0.71, 0.73, 0.71, and 0.72 were respectively obtained for causation orientation, experimentation, affordable loss, flexibility, pre-commitment, and competitiveness. These values were above the threshold of 0.7 recommended by Nunnally and Bernstein (1994).

4. Statistical Analysis/Results

All the analyses were carried out using SPSS version 23.

4.1. Factor Analysis

A bivariate correlation analysis was carried out to determine whether any relationship existed among the study variables as reported in Table 1. The analyses revealed that significant positive relationship existed between causation orientation and competitiveness (r = .482; $p < 0.01$); experimentation and competitiveness (r = .456; $p < 0.01$); affordable loss and competitiveness (r = .250; $p < 0.01$); and flexibility and competitiveness (r = .432; $p < 0.01$). However, the analysis did not find any significant relationship between pre-commitment and competitiveness (r = .012; $p < 0.01$).

Table 1 Mean, Standard Deviation and Correlation

Variables	Mean	SD	1	2	3	4	5	6
COM (1)	4.064	.641	1					
CAU (2)	3.812	.680	.173**	1				
EXP (3)	3.930	.699	.456**	.495**	1			
AFF (4)	3.875	.800	.250**	.412**	.466**	1		
FLE (5)	3.967	.674	.432**	.564**	.505**	.352**	1	
PREc (6)	2.988	1.033	.012	.152*	-.010	.129	.051	1

**$p < 0.01$ level (2-tailed); *$p < 0.05$ level (2-tailed); SD: Standard Deviation
COM: Competitiveness; CAU: Causation; EXP: Experimentation; AFF: Affordable Loss; FLE: Flexibility; PREc: Pre-commitment.
Source: Author's computation (2021)

4.3. Hierarchical Regression

To test the hypotheses developed for this study, hierarchical regression analysis was conducted. The analysis began with a preliminary test for multicollinearity, normality, linearity, and homoscedasticity to ensure that the assumptions of regression analysis were

not violated. The result of the variance inflation factors (VIF) for the multicollinearity test showed that causation orientation, experimentation, affordable loss, flexibility, and pre-commitment respectively had 1.033, 1.045, 1.028, 1.063 and 1.003. Since these values fell within recommended range of between 0.10 and 10, it implies that there was no problem of multicollinearity (Hair, Black, Babin, Anderson & Tatham, 2006). Also, the Normal P-P plot Regression Standardised Residual and the scatter plot were carried out and their results revealed that the assumptions of normality, linearity and homoscedasticity were met for this study.

Table 2 Hierarchical Regression Analysis Table

Model	Variables	B	Beta	t	Sig	R	R^2	F	P
	AGE	-.037	-.059	-.689	.492				
1.	EDUc	-.023	-.040	-.454	.586	.162	.026	1.407	.233
	EntreExp	.106	.118	-2.110	.036				
	SIZE	-.020	-.030	-.344	.731				
	AGE	-.022	-.036	-.488	.626				
	EDUc	-.032	-.055	-.888	.375				
	EntreExp	.016	.027	.355	.723				
2.	SIZE	.003	.005	.064	.949	.565	.319	10.626	.000
	CAUor	.269	.286	3.722	.000				
	EXP	.229	.249	3.348	.001				
	AFF	-.039	-.049	-.707	.481				
	FLE	.162	.170	2.256	.025				
	PREc	-.037	-.060	-1.012	.313				

Outcome variable: Competitiveness

EDUc: Education; EntreExp: Entrepreneurial Experience; CAUor: Causation orientation; EXP: Experimentation; AFF; Affordable Loss; FLE: Flexibility; PREc: Pre-commitment.

Source: Author's computation (2021)

Then, the study proceeded to the hierarchical regression analysis as shown in Table 2. The table had two models. Model one revealed that the control variables: age, education, entrepreneurial experience, and size significantly affected the outcome variable, competitiveness (F= 1.407; $p < 0.05$) as shown in the analysis of variance (ANOVA). The value of correlation coefficient (R) is 0.162 while the value of the coefficient of determination (R^2) is 0.026. This suggested that the control variable accounted for 2.6% of variation in competitiveness in the first model, implying that there are other variables that accounted for the remaining 97.4% not considered in this study.

Model two showed that the value of the correlation coefficient (R) is 0.565 while that of the coefficient of determination (R^2) is 0.319. This suggested that the predictor variables: causation orientation, experimentation, affordable loss, flexibility, and pre-commitment together with the control variables jointly accounted for a variation of 31.9% in competitiveness in the second model, implying that there are other variables that accounted for the remaining 68.4% not considered in this study. The ANOVA showed a significant relationship (F=10.626, $p < 0.05$), implying that the model is suitable for forecasting.

Finally, the analysis also showed how each component of the predictor variables contributed to competitiveness. Causation orientation (beta= .286; $t = 3.772$; $p < 0.005$) made the most unique statistical contribution to the outcome variable and closely

followed by experimentation (beta= .249; t = 3.348; p < 0.005), and flexibility (beta= .147; t = 2.256; p < 0.005). However, affordable loss and pre-commitment did not make any unique significant statistical data.

5. Discussion and Conclusion

This study principally focused on how Nigerian retail business entrepreneurs deal with uncertainty in the business environment to remain competitive. Therefore, two main hypotheses were proposed in this study.

The results from the correlation analysis revealed that Nigerian retail business entrepreneurs exhibited both causal and effectual behaviour when dealing with uncertainty in the business environment. This finding agrees with studies that suggested that effectuation and causation showed can be seen as complementing rather than exclusive strategies of uncertainty management (Frese et al., 2019; Laine & Galkina, 2016). A further analysis revealed that Nigerian retail business entrepreneurs score higher on causation (m =3.812) than on effectuation which gave an aggregate mean score of 3.69 (m =3.69). This revelation contradicts Eyana, et al (2018) who found that Ethiopian entrepreneurs lean more towards effectuation than causation.

The results from the hierarchical regression analysis of hypothesis one were mixed. Two dimensions of effectuation, experimentation and flexibility, had significant impact on competitiveness of Nigerian retail business entrepreneurs while the remaining two, affordable loss and pre-commitment, did not have any significant impact. This finding is in line with Eyana, et al (2018) who also revealed varying effects of the four dimensions of effectuation on the outcome variable of their study. Laine and Galkina (2016) also discovered that the varying degree is a function of the changing perception of uncertainty. These imply that the adoption of effectuation logic to management of uncertainty requires a comprehensive assessment of the business environment to ascertain which dimensions are appropriate at that point in time. The hierarchical regression result of the analysis of hypothesis two revealed that causation logic had the most unique significant impact on the competitiveness of Nigerian retail business entrepreneurs during period of uncertainty. This further lends support to the above correlation report. However, it did not align with Eijdenberg et al. (2017) who reported that small businesses lean more towards effectuation than causation.

The study concludes that both effectuation and causation are relevant to the competitiveness of Nigerian retail business entrepreneurs who seem to tend more towards causation orientation than effectuation.

6. Contribution to Knowledge

The findings from this study revealed that Nigerian retail business entrepreneurs applied more of causation logics than effectuation logics when dealing with uncertainties. This finding contradict previous studies that found that entrepreneurs are more effectuation oriented. Hence, this study contributes to knowledge by empirically showing that entrepreneurs will not always be more effectual oriented in all cases. In other words, effectuation is not superior to causation in the Nigerian context. Rather, the study confirmed that causation and effectuation should be seen as complementary and not exclusive strategies.

7. Limitation and Direction for Future Research

This study was restricted to Nigerian retail business entrepreneurs in Lagos state, Nigeria. Data collected was based on their perception which could be subjective and might affect the generalisation of findings. Therefore, future research may consider more states as well as a larger sample size.

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LOGIKA EFEKTUACIJE I KAUZACIJE PRI DONOŠENJU ODLUKA ZA UPRAVLJANJE NESIGURNOŠĆU I KONKURENTNOŠĆU OD STRANE NIGERIJSKIH MALOPRODAJNIH PREDUZETNIKA

Nesigurnost je jedna od najvećih dimenzija poslovanja koja menja biznis planove i pravce delovanja. Stoga, ovaj rad se pre svega bavi time kako se preduzetnici nose sa nesigurnošću koristeći i efektivnu i kauzalnu logiku. Istraživanje je rađeno studijom preseka dok je za prikupljanje primarnih podataka korišćena višestepena tehnika uzorkovanja. Ovi podaci su analizirani korišćenjem tehnika bivarijante korelacije i hijerarhijske regresije SPSS verzije 23. Rezultati korelacione analize pokazali su da su kauzacija (uzročnost) i tri od četiri pod-dimenzije efekuacije imale značajnog uticaja na konkurentnost dok pred-obaveze nisu. Analiza je dalje pokazala da su nigerijski maloprodajni preduzetnici više naginjali kauzaciji i efektuaciji. Rezultati hijerarhijske regresije pokazali su da je najveći uticaj na konkurentnost ostvarila uzročnost, a potom eksperimentisanje i fleksibilnost, međutim, pristupačan gubitak i preduzimanje obaveza nisu. Ova studija je doprinela znanju empirijski pokazavši da preduzetnici neće uvek u svim slučajevima biti orijentisani ka efektuaciji, takođe je potvrdila da kauzacija i efektuacija treba da se posmatraju kao komplementarne, a ne kao međusobno isključujuće strategije.

Ključne reči: *efektuacija, kauzacija, konkurentnost, maloprodaja, nigerijski preduzetnici, nesigurnost.*

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Original Scientific Paper

THE CONTRIBUTION OF SME DEVELOPMENT ORGANIZATION ON EXPORT: REGIONAL EXAMPLE

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Abstract. *In this study, the effects of KOSGEB subsidies on the foreign trade of SMEs were examined and the actions necessary to be taken by KOSGEB (SME Development Organization in Turkey) were emphasized. In the study, T test, ANOVA test and TUKEY tests were used and the study was conducted in Gaziantep, which is the 6th biggest city in Turkey. According to the results, companies' problems are accessing markets, financial problems, qualified personnel, language, and high personnel, raw material and production costs. Carrying out activities by KOSGEB such as market research, finding customers, providing financial support, contribution to qualified personnel salary, encouraging and supporting R&D activities, and providing consultancy are very important to solve the problems.*

Key words: *Grant, Trade, Export, SME*

JEL Classification: F 40, F61, H81

1. INTRODUCTION

In recent years, many studies were carried out on the development and facilitating of international trade. Export companies are in a more productive position than companies operating only in the domestic market (Hu & Tan, 2016). Export firms face additional costs, such as market research, adjustment of products to regulations or shipping costs, among other costs. These additional costs are a reason for more efficient firms to choose international markets.

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In addition, exporting firms tend to pay higher wages to their employees than non-exporting firms in the market (Fryges & Wagner, 2010). It is essential for exporters to gain productivity advantage before they start exporting. Exporters can export not just because they export but because they are efficient, that is, because they are more productive. When considered on an enterprise basis, although an SME's place in the economy is on a micro scale, these micro scales combine to contribute to the economy on a macro scale. For this reason, exporting firms with high productivity will grow faster when costs are reduced, whereas firms with low productivity and non-exporters will not be the same (Bernard et al., 2007).

An economic stabilization program implemented in 1980, the free trade liberalization and market-oriented economic, started reforms in Turkey. In this program, export subsidies and export-oriented growth policies were applied instead of import subsidy policies. Since then, integration into global markets and export orientation became new policy of Turkey. In a few years, these policies had positive effects on Turkish exports (Cinar & Koc, 2017).

Traditional international trade theories state that the exported products, and accordingly sectors, have a comparative advantage compared to the sectors of other countries, while they state that the imported products, accordingly sectors, have a comparative disadvantage compared to the sectors of other countries (Gnizy et al., 2017).

Companies operating in Turkey must be supported by the state in order to have an advantageous position in the foreign market. Public institutions play an important role during that time. Companies that export or have the potential should be supported not only financially but also with consultancy and coaching services (Astarlioglu, 2017).

Beside these, foreign trade has much importance for companies. These are things like increased revenue, competitive environment, longer product lifecycle, better risk management, exchange rate utilization, access to export finance.

Following the introduction, literature review, which includes former papers related to topic, has been investigated. In the third section, brief information about KOSGEB supports was given. The fourth section contains several discussions: the reason why this analysis was conducted, what is the importance of the paper. After this section, the analyzing techniques for data were given. In the sixth section, data collected from companies analyzed in SPSS software and test result were demonstrated. In the last section, by considering all information such as literature review and test results, suggestions are presented for both policy makers and researchers.

2. LITERATURE REVIEW

(Coase, 1960) made a number of assumptions about the government's market interventions. He stated that market interventions should be limited and that the regulation of the market can be done by the market itself. It was argued that the government should only intervene in the market to ensure low transaction costs. Depending on the government, political influences should not be allowed to be involved in the regulatory process.

(Stigler, 1971) examined the effect of the regulation on “cost / benefit” and “supply / demand” in the related to the sector. Putting it all into account, the entry limit is one of the most fundamental pieces that regulatory agencies can do for industry from political interests, according to Stigler. Political decisions sometimes do not reflect the position of majority voters, although political decisions have to maximize the votes of politicians’

subjects to the constraints of the total economic rents to be redistributed. It talks about the cost of information, training, and most importantly organizational costs for the group and the use of regulation in general. Stigler thinks of political parties as natural monopolies that make regulatory decisions. Stigler's analysis emphasizes that masses of relative group size have an influence on such arrangements, so these decisions are sometimes ineffective (Huberman & Kahn, 1988).

The political authority creates a natural monopoly on both decision and regulation processes. Competition for getting the benefits from regulation must increase total welfare for the whole society. Regulation needs for market must be analyzed in detail, meet the requirements of the industry and the benefits of the consumer (Deardorff, 1995).

International trade is considered one of the most important factors of economic development and global integration. It is thought that international trade has a positive effect on countries in many ways. Countries experiencing trade liberalization face different aspects and consequences of bilateral trade and international trade. The relationship between trade and income levels and convergence between countries were discussed in a way that takes into account total factor productivity, technological differences and factor accumulation. David Ricardo's dynamic two models of good production proved that trade benefits another group within the country at the cost of diminishing the utility of some groups, taking into account the country's prosperity and growth, and ultimately increased the overall welfare level (Zhang & Song, 2001).

Another view on the effects of trade on growth and economic welfare implies that, because of the size and economic power of some countries, they can act like a monopoly in the market, so policies are very important in this direction (Rourke, 2001). It is also stated that the role of economic integration through trade history had different effects on the New World as it became more unequal compared to the Old World at the end of the 19th century. Trade policies, complemented by the redistribution elements are significantly important to create an economically and socially sustainable environment at both national and global levels (Alesina & Rodrik, 1994). Venables, for example, showed that regional inequality in developing countries depends on the natural advantages of some regions over others (Evenett & Venables, 2002). The Venables model showed that companies investing in big cities due to "increased returns to scale" cause urban structures to deteriorate and make markets inadequate due to the growth of these cities above the optimal. Therefore, he states that this situation leads the economy to export. In fact, this argument contradicts Krugman's argument, indicating that the nature of the geographical environment can be modified to some extent by external factors (Krugman, 1999).

Developing a simple economic geography model (Krugman, 1991) showed that a country can become an industrialized "core" or agricultural "environment". By taking into the consideration approach of (Anderson, 1979) very similar to the gravity model, Krugman argued that firms often tend to locate production facilities closer to geographies with greater demands to utilize economies of scale, minimizing transportation costs. He concluded that the emergence of a differentiation between core and periphery depends on transportation costs, economies of scale, and the share of production in national income. In a more recent study, Krugman makes two conflicting views on geography. While the first view deals with the static role of these features due to the nature of geographical features, the second one considers that similar locations may result in different economic roles depending on factors such as factor inactivity and land rents, depending on the relationship between similar regions. So, it was stated that it can result in two different

efficiency levels with different economic organizations. As a result, although geography was a destiny affecting the economy in the past, it has started to cease to be a destiny today.

(Bergstrand, 1985) 's empirical tests supported the assumption that goods produced domestically are not perfect substitutes and imported products are a stronger substitute for local goods.

Grossman and Helpman, who work on the trade policies that the government can follow directly by transferring money to a group, can be mentioned. This series of research has opened up the role of the political and institutional environment in determining trade policy (Grossman & Helpman, 1994).

(Girma et al., 2020) analyzed whether manufacturing grant has effect on Chinese companies' export. At the beginning, they used an analyzing method that takes into account both direct and indirect impact of the government support on export. The findings showed that manufacturing grant affected Chinese companies' export performance positively.

(Brown & Troutt, 2018) studied on a research which explores the effect of export subsidies on welfare. The current research assumes that imports are restricted by the exporting country. (Brown & Troutt, 2018) believe that this theory is wrong on many dimensions: it contradicts the ceteris paribus assumption used in economic analysis; it is impractical in a world with rapidly declining shipping prices and free trade; and it conceals the real result of an export subsidy, which leads to inadequate intra-industry trade.

(Defever & Riano, 2016) analyzed, through a two-country exchange model with heterogeneous companies, the impact of grants subject to export share requirements that is conditioned on exports with at least a fraction of their production on welfare, exports and competitiveness. The model states that this form of government support boosts exports better and gives more protection to domestic companies, but with significant welfare costs, than a regular unconditional export subsidy.

(Broocks & Van Biesebroeck, 2017)'s paper is another study on export subsidies. They are asserting that it is important for companies learning how to increase or start exporting especially for small economies. Countries which have small and open economies generally provide subsidies to boost export. they studied with the data of company located to Flanders region in Belgium. The main aim of authors is to see if subsidies increase the export outside the EU. The analysis showed that subsidies have a positive effect on export.

The paper of (Srhoj & Walde, 2020) analyzed the effect of an export subsidies plan created in expectation of participation of a country to the European Union. This plan intended to encourage activity in international market introductions and in technological advancement for emerging or current goods. They found that this new approach has a positive impact on the company's profits, export and net income. Supports were categorized in 2 section which are Technological grants and marketing-oriented grants. Technological grants affect exports and capital stocks positively, while marketing-oriented grants affect exports and intermediate inputs positively. They also found no impacts on wages, and just a minor impact on total factor productivity.

(Sørensen, 2020) proposed a one sector - two country heterogeneous company model. It included companies financed by export promotion organization. The result of the study showed that government support affects export positively, because Via intra-industry reallocations, companies share what was learnt or gained from support with the trading partner. So, the knowledge related to export will spread and many companies will benefit from support directly or indirectly.

(Esaku, 2020) investigated the impact of physical capital spending on companies' decision to enter the international market and increase export volume. He found that physical capital expenditure at the company level raises the likelihood of small businesses entering export markets. It was also discovered that export knowledge has a huge impact on a firm's decision to invest, most likely as a means of improving manufacturing technology. At the policy stage, it was offered that export subsidies should be targeted to solve capability and technology problems, which make it difficult for small companies to enter the international market and increase their export strength.

3. KOSGEB SUPPORT

In order to increase the share and effectiveness of small and medium-sized enterprises in meeting the economic and social needs of the country, to increase their competitiveness and level, to realize the integration in the industry in accordance with economic developments, the Small and Medium Enterprises Development and Support Administration was established. The short name of the organization is KOSGEB (Legislation Information System, 1990). KOSGEB is a Public Institution related to the Ministry of Industry and Technology, has a legal personality and is subject to private law provisions in all its transactions. KOSGEB provides support to businesses in many areas. KOSGEB supports are important for exporting enterprises. These supports can be summarized as follows.

R&D support is a support provided when businesses find a new product or develop an existing product. There are support items such as R&D support, lease support, machinery-equipment, hardware, raw material, software and service procurement expenses support, personnel expense support, initial capital support, project development support. The total support limit of R&D support is 750,000 TL. The support rate is 75%. The main purpose of R&D support is to find a prototype of a product. If a prototype of the product is found, The Technological Product Investment Support Program is offered to commercialize this product. The Technological Product Investment Support Program includes supports such as Machine-Equipment, Hardware, Consumables, Software and Design Expenses Support, Personnel Expense Support.

Collaboration and Cooperation Support Program is a support created to find common solutions to common problems. For purposes such as joint procurement, joint manufacturing and service delivery, joint marketing, joint laboratory, joint design, businesses need to come together and establish a new business. In order to benefit from the support, projects to be prepared by at least 5 enterprises coming together and if they will operate in the Medium-High and High Technology Fields, the projects to be prepared by at least 3 companies are supported. The support rate is 60%. In this context, the expenditures of enterprises such as machinery equipment, software and personnel are supported. In the Medium-High and High Technology areas, 300,000 TL non-refundable 1,200,000 TL refundable and 300,000 TL non-refundable 700,000 TL refundable support is provided to enterprises. Common raw material prices are one of the biggest problems encountered while exporting. If businesses become larger, they will gain an advantage for themselves by providing cheaper raw materials. It is also difficult for small businesses to establish a market research unit. In case the business grows, they will be able to establish units for export by establishing departments under their own roof. The growth of businesses will also bring institutionalization to businesses and therefore have a positive effect on exports.

Loan interest support, which is generally opened by call, aims to solve the financial problems of businesses. The relevant interest is important for all businesses as well as for exporting businesses. This flexible support, which can be used in places such as the purchase of machinery equipment or raw materials, is important in terms of exports.

The General Support Program is divided into 15 different branches. The total support amount reaches 470,000 TL. Here, branch of this support which has highest contribution to exports in this program can be described as follows. Domestic fair support is important for buyers from abroad to find the products they want to buy and to get to know the business. The total support amount of the fair is 50,000 TL. The amount of this support is 20,000 TL. Instead of supporting individual trips of businesses, supporting the trips made by institutions such as Chambers of commerce contributes to exports by providing a more effective foreign trade by communicating on the basis of institutions and reaching the purpose of the trip. It is important for businesses to be able to print catalogs, to advertise in printed publications abroad and to make business promotions. Thus, it enables businesses to reach a wider audience and thus increase their exports. The amount of support is 25,000 TL. Qualified staff support amount is 50,000 TL. When businesses want to employ qualified staff, who can speak a language with a high level of education, they usually face cost problems due to high wages. It is an important support in solving this problem. It is impossible for businesses to know the legislation in foreign countries completely, or they do not have personnel to do such work. For this reason, businesses may have to get support from outside. If they want to train their own staff to get support in this regard, they can benefit from training support, if they only want to receive consultancy, they can benefit from consultancy support. The amount of consultancy support is 22,500 and the amount of training support is 20,000 TL. It is important for businesses to find opportunities to reduce their costs while competing in the foreign market. Logistics support is a support of 40,000 TL that reduces the transportation costs of the enterprises and thus increases their competitiveness in exports. One of the most important problems of SMEs is finding customers. Thanks to the matching support, companies that want to export products can find customers through the matching Centers. The support amount is 30,000 TL.

The European Business Network is a structure that has many companies within itself, allows these companies to sell their products, and provides mentorship to businesses rather than financial support. Being in such a wide network will give businesses a great advantage in finding customers. In addition, it is an important support to Turkey in terms of attracting external funding by writing projects.

4. Objective, Importance, and Scope of the Research

The aim of the research is to investigate the effects of KOSGEB supports on the foreign trade of SMEs and how important KOSGEB supports are for SMEs.

As known, the positive effects of exports on the economy are quite high. Increasing these positive effects will contribute to economies in many aspects, such as decrease in unemployment and increase in income level. Therefore, this research was aimed to work on how to remove the obstacles in front of exports by KOSGEB and then how to increase exports.

Exchange bottlenecks, on occasion, emerge in Turkish Economy. These bottlenecks cause some damages on the economy both in general and regionally. In order to minimize these damages, some support should be provided by the state. For this reason, this study is important in terms of determining the needs of SMEs and seeing what kind of support can be provided for these problems in terms of KOSGEB.

Within the scope of the research, SMEs registered to the Southeastern Anatolia Exporters Union and located in Gaziantep were included in the analysis. It was seen that there are 2321 companies registered in the database.

The sample size was determined by considering the population number of 2321. With a margin of error as 10%, it was seen that 92 companies would be sufficient to answer the questionnaire at 95% confidence level. However, the number of surveys answered was 103 and the survey results were evaluated by considering these 103 companies.

The questionnaire method was used as the research method in this paper. Survey questions were directed to SMEs and their problems, situations and needs were tried to be analyzed. In the survey, the enterprises were asked 16 questions, 1 of which was open-ended. In this context, the first 12 questions are about getting to know the SMEs, the 13th question is about understanding the problems faced by SMEs in exports, the 14th question is on measuring the effects of KOSGEB supports on exports and the 15th question is on measuring expectations of SMEs from KOSGEB. 16. The question is an open-ended question and it is the question asked to see the expectations, suggestions, opinions of the SMEs from KOSGEB to increase exports.

5. METHODS

Reliability test provides information about whether the data used in an analysis is consistent. In other words, it shows whether individual's answers to survey questions are consistent or not. Under the same conditions, a reliable test should give the same results when re-applied. To put it another way, reliability analysis is a requirement for obtaining reliable outcomes from the analysis to be performed. In sum, unreliable data cannot be used in analysis. Briefly, reliability analysis is used to see if the scale questions are reliable. The value, which is α, is between 0 and 1. The α value can be seen below (Cronbach, 1951; Cronbach & Shavelson, 2004).

$0 \leq \alpha < 0.4$ is not reliable,
$0.4 \leq \alpha < 0.6$ reliability is low,
$0.6 \leq \alpha < 0.8$ is reliable
$0.8 \leq \alpha < 1$ is highly reliable.

T Test, ANOVA Analysis and TUKEY Analysis are also other methods for questionnaire analysis. The main aim of these analyses is to reveal if there is a significant difference between groups.

The t-test is one of the most often used predictive research techniques. This test is a foundational component in many univariate analyses and one of the most often used methods in hypothesis testing studies. It is used to test if the variance between constant variables or classes is statistically important, or to establish whether the average observable value differs from the expected value. In brief, T test compares two means, so

it reveals whether these 2 means are different or not. To put it another way, it shows if the emerging differences resulted by chance or not (Student, 1908).

The purpose of ANOVA test is to see if there is a significant difference between the means of independent groups. ANOVA is used for comparison of a numerical variable in at least three groups. This examination mostly examines when one group at least differs from the other. In sum, ANOVA analysis is similar to T test, if there is more than 2 groups this method is used. This analysis usually evaluates the difference between groups.

When the ANOVA test shows a statistically significant P value, TUKEY test is used to determine the difference among the groups. Tukey analysis is one of post hoc analyses. The main aim of post-hoc analysis is to compare 2 groups. There are some issues that need to be taken into account while examining the mean of the groups. These issues are deviations and averages of the groups. Tukey analysis is a more specific analysis than ANOVA, and TUKEY method is used to see significant difference groups individually (Lindman, 1974).

Within the scope of the research, the hypotheses were formed as follows.

H_1: There are differences between the problems faced by SME groups who benefit and do not benefit from the programs offered by KOSGEB.

H_2: There are differences between the problems SME groups face according to the sectors in which SMEs operate.

H_3: There are differences among the problems SME groups face according to the export amounts.

H_4: There are differences between the problems SME groups face according to the net sales amounts.

H_5: There are differences between the problems faced by SME groups according to the export regions.

H_6: There are differences between the problems SME groups face according to the most important competitors.

6. RESULTS

Results of the analysis can be seen below. According to reliability analysis, as seen below, questions are reliable, because Cronbach's Alpha value is 0,881. As seen, the value is between $0.8 \leq \alpha < 1$. It means the values is highly reliable, so further analysis can be implemented to questionaries result.

Table 1 Reliability analysis

Cronbach's Alpha	Number of Questions
0.881	28

Source: Own calculation based on available data

As seen in the Table 2, the problems faced by SMEs were analyzed according to whether they have benefitted from KOSGEB supports or not in the last 3 years. As a result, it was observed that there was a significant difference between the two groups regarding High Salaries. It shows that businesses that benefit from KOSGEB supports have less problems in this regard than those that do not.

The skilled staff issue is crucial for companies. It is clear that skilled staff are working on the market for a higher wage. While supporting employees, it is also important to be more selective to help the employees who contribute to firms more effectively, instead of supporting both graduates and undergraduate students and supplying a small amount of support.

Table 2 Analysis of the problems faced by SMEs in cases of benefiting and not benefiting from KOSGEB supports (Last 3 years)

Benefitting or not benefiting from KOSGEB support		N	Mean	Std. Deviation	Std. Error Mean	T	P
Bureaucratic Barriers	Yes	52	3.4423	1.17846	0.16342	3.607	0.060
	No	51	3.5098	0.94599	0.13247		
Problems in accessing markets	Yes	52	3.3846	1.06925	0.14828	0.002	0.963
	No	51	3.4314	1.08176	0.15148		
Raw material costs	Yes	52	4.2308	1.07768	0.14945	0.406	0.526
	No	51	4.1373	1.00039	0.14008		
Financial problems	Yes	52	3.7308	1.06854	0.14818	1.728	0.192
	No	51	3.4706	1.22234	0.17116		
Qualified personnel or language problems	Yes	52	3.3846	1.17413	0.16282	0.149	0.700
	No	51	2.7647	1.30519	0.18276		
High Staff Salaries	Yes	52	2.5490	1.23796	0.17335	4.831	0.030
	No	51	2.9423	1.03684	0.14378		
Problems in accessing Incentives and Supports	Yes	52	3.5577	1.03684	0.14378	1.102	0.296
	No	51	3.8824	1.01286	0.14183		
High logistics costs	Yes	52	3.8462	1,10940	0.15385	2.106	0.150
	No	51	3.8431	0.90272	0.12641		
High production costs	Yes	52	4.0962	0.97538	0.13526	0.000	0.994
	No	51	4.1569	0.94599	0.13247		

Source: Own calculation based on available data

The problems faced by SMEs in the different sectors have been analyzed. The main purpose is to see whether there is a difference between the sectors compared. As a result, when the problems were taken into consideration, no significant difference was observed between the groups.

As seen in the Table 3, the problems faced by SMEs according to export volumes were analyzed. The main purpose is to see if there is a difference in the problems encountered according to export volumes. As a result, considering the problems, a significant difference was found between the groups in terms of Qualified personnel or language problems and high personnel salaries. After considering these results, Tukey analysis should be implemented.

Table 3 Analysis of the problems faced by SMEs - According to export volumes - (ANOVA)

		N	Mean	Std. Dev	Std. Err	f	p
Bureaucratic Barriers	0-499,000$	49	3.4898	1.12031	0.16004	0.382	0.766
	500,000-999,999 $	20	3.3000	1.26074	0.28191		
	1,000,000-4,999,999$	23	3.4783	0.89796	0.18724		
	5,000,000$ and more	11	3.7273	0.78625	0.23706		
	Total	103	3.4757	1.06499	0.10494		
Problems in accessing markets	0-499,000$	49	3.5306	1.13838	0.16263	0.603	0.615
	500,000-999,999 $	20	3.1500	1.18210	0.26433		
	1,000,000-4,999,999$	23	3.3913	0.94094	0.19620		
	5,000,000$ and more	11	3.3636	0.80904	0.24393		
	Total	103	3.4078	1.07043	0.10547		
Raw material costs	0-499,000$	49	4.0612	1.12561	0.16080	0.436	0.728
	500,000-999,999 $	20	4.3000	1.21828	0.27242		
	1,000,000-4,999,999$	23	4.3043	0.87567	0.18259		
	5,000,000$ and more	11	4.2727	0.46710	0.14084		
	Total	103	4.1845	1.03609	0.10209		
Financial problems	0-499,000$	49	3.7959	1.17224	0.16746	1.304	0.277
	500,000-999,999 $	20	3.6500	1.34849	0.30153		
	1,000,000-4,999,999$	23	3.3043	1.06322	0.22170		
	5,000,000$ and more	11	3.2727	0.64667	0.19498		
	Total	103	3.6019	1.14908	0.11322		
Qualified personnel or language problems	0-499,000$	49	3.5918	1.20621	0.17232	8.096	0.000
	500,000-999,999 $	20	3.1000	0.96791	0.21643		
	1,000,000-4,999,999$	23	2.2609	1.17618	0.24525		
	5,000,000$ and more	11	2.4545	1.21356	0.36590		
	Total	103	3.0777	1.27333	0.12546		
High Staff Salaries	0-499,000$	49	3.2041	1.09886	0.15698	7.157	0.000
	500,000-999,999 $	20	2.7000	1.08094	0.24170		
	1,000,000-4,999,999$	23	2.0435	0.97600	0.20351		
	5,000,000$ and more	11	2.2727	1.00905	0.30424		
	Total	103	2.7476	1.15231	0.11354		
Problems in accessing Incentives and Supports	0-499,000$	49	3.8571	1.00000	0.14286	0.934	0.427
	500,000-999,999 $	20	3.6500	1.30888	0.29267		
	1,000,000-4,999,999$	23	3.4348	0.94514	0.19707		
	5,000,000$ and more	11	3.8182	0.75076	0.22636		
	Total	103	3.7184	1.03296	0.10178		
High logistics costs	0-499,000$	49	3.6531	1.16460	0.16637	1.467	0.228
	500,000-999,999 $	20	4.0000	1.07606	0.24061		
	1,000,000-4,999,999$	23	3.9130	0.66831	0.13935		
	5,000,000$ and more	11	4.2727	0.46710	0.14084		
	Total	103	3.8447	1.00740	0.09926		
High production costs	0-499,000$	49	4.0204	1.12712	0.16102	0.652	0.584
	500,000-999,999 $	20	4.3000	0.97872	0.21885		
	1,000,000-4,999,999$	23	4.0870	0.66831	0.13935		
	5,000,000$ and more	11	4.3636	0.50452	0.15212		
	Total	103	4.1262	0.95671	0.09427		

Source: Own calculation based on available data

Table 4 Analysis of the problems faced by SMEs - According to export volumes - (Tukey significance analysis)

	Export Volume		Tukey Sig.
Qualified personnel or language problems	0- 499,000$	1.000.000- 4.999.999$	0.000
		5.000.000$ and more	0.021
High Staff Salaries	0-499,000$	1.000.000- 4.999.999$	0.000
		5.000.000$ and more	0.048

Source: Own calculation based on available data

Table 5 Analysis of the problems faced by SMEs - According to export volumes

	Export Vol.	Mean
Qualified personnel or language problems	0-499,000$*	3.5918
	1,000,000- 4,999,999$*	2.2609
	5,000,000$ and more*	2.4545
High Staff Salaries	0-499,000$	3.2041
	1,000,000- 4,999,999$	2.0435
	5,000,000$ and more	2.2727

Source: Own calculation based on available data

As seen in tables 4 and 5 above, significance was found in the ANOVA analysis for "Qualified personnel or language problems" and "High Staff Salaries", and hence the TUKEY analysis was applied. As seen from the above table, there is a significant difference in terms of qualified personnel or language problems between those with export volume of 0-499,000 $ and those with 1,000,000 $ 4,999,999 and 5,000,000 $ and more.

In terms of High Staff Salaries, a significant difference was determined between those with export volumes of 500,000-999,999 $ and those with export volumes of 1,000,000-4,999,999 $ and 5,000,000 $ and above. Similarly, it was observed that there is a significant difference between SMEs with an export volume of 500,000-999,999 and those with an export volume of $ 1,000,000- $ 4,999,999.

Test results show that companies with low export level experience greater problems with Qualified personnel or language problems. Similarly, high personnel wages pose a bigger problem for businesses with an export volume of up to $ 500,000. For this reason, while providing support, businesses with an export volume of up to $ 500,000 can be privileged and more support should be given in this regard. For example, these companies can be made more attractive than other companies by providing salary support and ensuring that the business pays higher salaries to qualified personnel.

The problems encountered were analyzed considering the net sales volumes. The main purpose is to see whether there are differences in terms of problems according to the net sales volumes encountered. As a result, when the problems were taken into consideration, no significant difference was observed between the groups. However, in terms of net sales volumes, no significant difference was detected in the problems encountered.

Table 6 Analysis of the problems faced by SMEs - According to the most exported region - (Anova)

		N	Mean	Std. Deviation	Std. Error	f	p
Bureaucratic Barriers	Europe Zone	28	3.7857	0.95674	0.18081	1.725	0.150
	America Zone	11	3.9091	0.83121	0.25062		
	Middle East Zone	39	3.2821	1.09901	0.17598		
	Asia Zone	13	3.2308	1.16575	0.32332		
	Other	12	3.2500	1.13818	0.32856		
	Total	103	3.4757	1.06499	0.10494		
Problems in accessing markets	Europe Zone	28	3.3571	1.02611	0.19392	1.269	0.287
	America Zone	11	3.7273	1.00905	0.30424		
	Middle East Zone	39	3.2821	1.07480	0.17211		
	Asia Zone	13	3.1538	1.28103	0.35529		
	Other	12	3.9167	0.90034	0.25990		
	Total	103	3.4078	1.07043	0.10547		
Raw material costs	Europe Zone	28	4.3214	1.05597	0.19956	1.442	0.226
	America Zone	11	4.7273	0.46710	0.14084		
	Middle East Zone	39	3.9487	1.14590	0.1834		
	Asia Zone	13	4.2308	0.92681	0.2570		
	Other	12	4.0833	0.99620	0.28758		
	Total	103	4.1845	1.03609	0.10209		
Financial problems	Europe Zone	28	3.5357	0.96156	0.18172	0.262	0.902
	America Zone	11	3.4545	1.50756	0.45455		
	Middle East Zone	39	3.5641	1.20950	0.19367		
	Asia Zone	13	3.7692	1.09193	0.30285		
	Other	12	3.8333	1.19342	0.34451		
	Total	103	3.6019	1.14908	0.11322		
Qualified personnel or language problems	Europe Zone	28	3.1786	0.94491	0.17857	2.534	0.045
	America Zone	11	3.3636	1.36182	0.41060		
	Middle East Zone	39	2.6923	1.37943	0.22089		
	Asia Zone	13	3.0000	1.15470	0.32026		
	Other	12	3.9167	1.31137	0.37856		
	Total	103	3.0777	1.27333	0.12546		
High Staff Salaries	Europe Zone	28	2.6786	0.86297	0.16309	1.742	0.147
	America Zone	11	3.0909	1.13618	0.34257		
	Middle East Zone	39	2.5128	1.27469	0.20411		
	Asia Zone	13	2.6923	1.18213	0.32786		
	Other	12	3.4167	1.16450	0.33616		
	Total	103	2.7476	1.15231	0.11354		
Problems in accessing Incentives and Supports	Europe Zone	28	3.7143	0.93718	0.17711	0.890	0.473
	America Zone	11	3.2727	1.48936	0.44906		
	Middle East Zone	39	3.7436	0.96567	0.15463		
	Asia Zone	13	3.6923	1.03155	0.28610		
	Other	12	4.0833	0.99620	0.28758		
	Total	103	3.7184	1.03296	0.10178		
High logistics costs	Europe Zone	28	3.7857	0.95674	0.18081	4.645	0.002
	America Zone	11	4.8182	0.40452	0.12197		
	Middle East Zone	39	3.4872	0.94233	0.15089		
	Asia Zone	13	4.0769	0.95407	0.26461		
	Other	12	4.0000	1.20605	0.34816		
	Total	103	3.8447	1.00740	0.09926		
High production costs	Europe Zone	28	3.9643	0.83808	0.15838	1.319	0.268
	America Zone	11	4.5455	0.68755	0.20730		
	Middle East Zone	39	4.0000	0.94591	0.15147		
	Asia Zone	13	4.4615	0.87706	0.24325		
	Other	12	4.1667	1.40346	0.40514		
	Total	103	4.1262	0.95671	0.09427		

Source: Own calculation based on available data

The problems encountered were analyzed by considering the regions where the most exports are made to. As a result, considering the problems, no significant difference was observed between the groups in terms of qualified personnel or language problems and high logistics costs. Tukey analysis is required to see between which groups this significant difference exists.

Table 7 Analysis of problems faced by SMEs - According to the most exported region - (Tukey significance analysis)

	The most exported region	Tukey Sig.
Qualified personnel or language problems	Middle East Zone	0.028
High logistics costs	Europe Zone	0.022
	America Zone	0.001

Source: Own calculation based on available data

Table 8 Analysis of problems faced by SMEs - According to the most exported region - (Tukey)

	The most exported region	Mean
Qualified personnel or language problems	Middle East Zone*	2.692
	Other*	3.917
High logistics costs	Europe Zone*	3.786
	America Zone*	4.818
	Middle East Zone*	3.487

Source: Own calculation based on available data

When TUKEY analysis was carried out, there is a significant difference for qualified personnel or language problems between the Middle East and other regions; for the problems of high logistics costs, there is a significant difference between the European Region - America Region and America Region - Middle East Region.

The results of tests indicate that businesses exporting to another area have more difficulty with qualified staff or with language issues. So, companies exporting other zones can be prioritized while providing incentives and grants by the government. In addition, companies exporting to America zone should be provided with more logistic support due to the high cost. Providing consultancy service about trade legislation will also accelerate and facilitate export.

The problems encountered were analyzed by considering the most important competitors of the SMEs. As a result, no significant difference was found between the groups when the problems were taken into account.

Table 9 Hypothesis results

Hypothesis	Result
H_1: There are differences between the problems faced by SME groups who benefit from and do not benefit from the programs offered by KOSGEB.	Accepted
H_2: There are differences between the problems SME groups face according to the sectors in which SMEs operate.	Rejected
H_3: There are differences among the problems SME groups face according to the export amounts.	Accepted
H_4: There are differences between the problems SME groups face according to the net sales amounts.	Rejected
H_5: There are differences between the problems faced by SME groups according to the export regions.	Accepted
H_6: There are differences between the problems SME groups face according to the most important competitors.	Rejected

7. CONCLUSION

Export plays an important role in the development of the country's economies. The export made by companies will not only contribute to the relevant sector, but also to the entire country's economy as it provides foreign currency inflow to the country. KOSGEB has an important role as well as many public institutions in terms of SMEs not having problems in exports and increasing their exports even more in their companies that do not have problems. Therefore, some actions should be taken considering the needs of the SMEs.

In view of the responses of the SMEs involved in the study, the problems faced by companies can be seen. One of the most important problems, in this context, was the problem in accessing markets. So, market research conducted by KOSGEB will make an important contribution to increasing exports. International business trip support is also important for SMEs to find new markets. The fact that matching support is provided by KOSGEB contributes to finding new buyers, customers. Apart from this, it should be ensured that SMEs are included in the COSME network and thus reach many buyers and sellers in a wide network.

Another problem faced by SMEs were financial problems. In order to solve financial problems, credit support should be provided for the needs of SMEs. However, considering the possibility that the enterprises will behave unconscionably while using the related loan, it is necessary to follow up where the loan will be spent. Otherwise, the relevant support will go to the personal and luxury needs of the companies' authorities (for example, the purchase of higher model vehicles, etc.) and the current account deficit will grow further.

Another problem faced by SMEs is the inability to access support. Therefore, the promotion of support should increase and the application processes for support should become easier.

The lack of research and development is another issue. However, the importance of this issue should be explained to the enterprises operating in sectors such as machinery and software that have strategic importance and should be encouraged in this regard. Companies are of the opinion that R&D, Innovation, Industrialization Support Program is important for export. One of the biggest reasons is that the return of technology-based products is both easier to export and their return is high. Today, the market value of some big companies

working on technology-based companies such as Apple and Amazon, is more than one trillion dollars. Therefore, supporting R&D activities will make a great contribution to exports.

It is another fact that SMEs have problems with raw material prices and production costs. Considering the economies of scale, it can be seen that large companies experience fewer problems in terms of supply and cost than other companies. For this purpose, the merger of small businesses and establishing a new company will provide many advantages such as reducing their costs and facilitating the procurement process.

In order to increase export volumes, the promotion of both the enterprise and their products should be increased. In this context, supports such as fair support and promotional support are important in terms of increasing exports, as can be seen from the survey results.

It is impossible to know everything about foreign markets. In this respect, it is essential to get support from professionals. The fact that this support can be obtained from KOSGEB under the name of training support or consultancy support will again contribute positively to exports.

Although it was seen that a wide sample size was reached in the research, efforts should be made to increase the promotion of the existing supports, and a wider population should be reached. So, KOSGEB's promotional activities should be increased.

Although it is very important to support SMEs financially, as can be seen from the results of the survey, SMEs also need consultancy and training. Although consultancy support is provided to solve this problem, the number of consultants who will provide quality information or conduct research is not enough in the market, unlike in KOSGEB, which has a very wide network of information about the markets. For this, such support should be provided to enterprises by KOSGEB.

In this paper six hypotheses are created. While "H_1: There are differences between the problems faced by SME groups who benefit from and do not benefit from the programs offered by KOSGEB. H_3: There are differences among the problems SME groups face according to the export amounts. H_5: There are differences between the problems faced by SME groups according to the export regions." are accepted, "H_2: There are differences between the problems SME groups face according to the sectors in which SMEs operate. H_4: There are differences between the problems SME groups face according to the net sales amounts. H_6: There are differences between the problems SME groups face according to the most important competitors." are rejected.

In the H_1 hypothesis, the problems faced by SMEs in the last 3 years were evaluated in the test results according to whether or not they have been supported by KOSGEB. As a result, it was seen that there was a significant difference in the salary rates between the two classes. The problem of qualified personnel, language and high personnel salaries were another striking issue. It was quite natural that these problems are seen at the same time in companies. Because it was obvious that qualified personnel work for a higher salary in the market. Therefore, while supporting the staff, instead of supporting all graduates and undergraduates and providing a low amount of support, it is necessary to be more selective and give higher support to the staff who will contribute to the companies at a higher rate. Therefore, within the scope of the Business Development Support Program, privilege that should be given to the company exporting for qualified personnel will have a positive effect.

In the H_2 hypothesis, the difficulties that SMEs face in various sectors have been investigated. The main goal is to see if there is a difference between the sectors that are being compared. As a consequence, when the issues were considered, there was no significant difference between the sectors.

In the third hypothesis, the issues that SMEs face were examined by looking at export volumes. It was seen that there was a significant difference in terms of skilled staff or language issues between those with export volumes of 0-499,000 dollars and those with 1,000,000 dollars, 4,999,999 dollars, and 5,000,000 dollars and more. There was a significant difference, with regards to high staff salaries, between those with export volumes of 500,000-999,999 $ and those with export volumes of 1,000,000- 4,999,999 $ and 5,000,000 $ and above. Similarly, a major difference was found between SMEs with export volumes of $500,000-999,999 and those with export volumes of $ 1,000,000-$ 4,999,999. According to test results, companies with a low export level have more issues with qualified workers or language barriers. Similarly, for companies with an export amount of up to $500,000, high personnel wages are a bigger problem. As a result, companies with export volumes of up to $500,000 could be given priority, and further assistance should be provided in this region. For example, these businesses can be made more appealing than others by offering wage support and ensuring that eligible employees are paid higher wages.

In the fourth hypothesis, the problems that SMEs face were examined by regarding the net sales volumes. Consequently, when the problems were taken into account, there was no significant difference between the classes.

In the H_5 hypothesis, issues which companies encountered were analyzed by regarding the regions where the most exports are directed. There is a significant difference between the Middle East and other regions in terms of skilled workers or language issues; there is a significant difference between the European Area - America Region and the America Region - Middle East Region in terms of high logistical costs. Test findings show that companies exporting to other regions have more trouble finding skilled workers or dealing with language barriers. As a result, while businesses exporting to other zones can be prioritized while the government provides incentives and grants. In addition, because of the high cost, companies exporting to the Americas zone should be given more logistic support.

The aim of H_6 hypothesis is to check if there are any differences between company groups, considering their most important competitors. when the problems were analyzed, there was no significant difference detected between the groups.

Considering the results, it was seen that there are some problems arising for companies and these problems should be solved. It is obvious that the majority of KOSGEB supports are effective on exports and will play an active role in solving these problems.

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DOPRINOS ORGANIZACIJE ZA RAZVOJ MSP IZVOZU: PRIMER IZ REGIONA

U ovom radu, proučavani su efekti subvencija agencije KOSGEB (Organizacija za razvoj MSP u Turskoj) na izvozne aktivnosti MSP i naglašene su aktivnosti koje bi KOSGEB trebalo da preduzme. Korišćeni su T test, ANOVA test i TUKEY test, a istraživanje je sprovedeno u Gazijantepu, šestom po veličini gradu u Turskoj. Prema rezultatima, problemi kompanija su pristup tržištima, finansijski problemi, kvalifikovano osoblje, jezici, i visoki troškovi za kadrove, sirovine i proizvodnju. Za rešavanje ovih problema, KOSGEB treba da sprovede aktivnosti kao što su istraživanje tržišta, pronalazak mušterija, pružanje finsnijske podrške, doprinos platama kvalifikovanog osoblja, podrška aktivnostima istraživanja i razvoja i pružanje konsultatntskih usluga.

Ključne reči*: Grant, Trgovina, Izvoz, MSP*

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Original Scientific Paper

OWNERSHIP STRUCTURE AND FINANCIAL PERFORMANCE OF MANUFACTURING FIRMS IN SUB-SAHARAN AFRICA

UDC 339

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Abstract. *This study investigates the effect of ownership structure on the financial performance of listed manufacturing firms in three Sub-Saharan Africa countries (Nigeria, Kenya and South–Africa) based on the critical mass indices of their respective bourse. Relevant data from the financial reports of sampled firms were analyzed using the co-integration test and the system-GMM for a period 2010-2019 using Return on Asset, and Tobin-Q as dependent variables while government ownership, block ownership and institutional ownership concentrations were explanatory variables. The empirical results revealed that all the explanatory variables have significant effect on the performance indicators (ROA, TOBIN Q). The result of robustness checks also revealed that both government and institutional ownership concentrations have predominately negative effect on financial performance for the respective countries while block ownership concentration is largely positive for most of the manufacturing firms. The study recommends that policy makers should create favorable policies to encourage balanced investment from all categories of investors and ensure only few owners who have the wherewithal to diversify and attract skills and competencies to improve firm performance. Government should also retain some ownership in foreign and local firms to enhance shareholders' confidence.*

Key words: *Ownership structure, manufacturing Firms, Performance, GMM*

JEL Classification: G32, L25, L60

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1. INTRODUCTION

The modern argument about the owner-manager relationship was initiated by Berle and Means (1932) and proposed an indirect association among the diffusion of equity holdings and company's profitability. They suggested that a complex diffuse rights break down the relationship among management and ownership, in furtherance optimization of income is hence not certain. The fewer equities each equity holder holds the less authority he or she can exert on the skilled agent. After been torpid for years, the argument was engaged by Monsen, Chiu and Cooley (1968) who examined the influence of the parting of rights from control on the value of big companies. They discovered that principal managed companies were more lucrative than companies managed by agents. The recent past has witnessed significant changes in ownership concentration with respect to ownership structure mechanism, due to breakdown of reputable firms like Enron and WorldCom in U.S.A. The trend was replicated across the globe as evidenced by collapse of Parmalat Company in Europe, Chuo Aoyama in Asia, JCl and Randgold in South Africa, Skye bank in Nigeria, Uchumi, Imperial bank and Chase bank in Kenya (Ongore & K'Obonyo,2011). Attracting keen scholarly consideration to the relevance of the various ownership structure influencing profitability of firms, the link between ownership structure and performance of firms has led to a serious concern to corporate investors leading to a significant consideration in the larger scope of modern finance and amongst various stakeholders.

Jiang (2015) recommends that since ownership structure is an important component in present corporate governance mechanism, there should be a departure of firm ownership from firm management. Berghe and Levrau (2007) note that ownership structure is primarily the driving force mutually for investing public and creditors because owners of a firm have economic relations with a company and influence the types of decisions taken by the firm to reduce the exposure to financial risk and improve financial performance. This is because ownership concentration has the capacity of putting decent governance structures in place to enhance firm's ability to attract external funding (Trien & Chizema, 2011). Villalonga and Amit (2006) suggest a direct relationship between rights acquisition and company's profitability because board members elected by the owners' function as the intermediary between them and their managers. The board is saddled with four main obligations such as: leadership obligation; stewardship obligation; monitoring obligation; and reporting back to owners which has a direct bearing on financial performance. Jensen (1989) and Lins (2002) argue that the effectiveness of the board helps to alleviate the agency conflicts whenever business decisions and choices of principals are at variance through controlling and monitoring the managerial actions. The internal influence imposed by the board reinforces the external function of the markets in monitoring and controlling managers (Jensen, 1989). According to Brown (2004), the constraints imposed by the board to the management makes them to be extra vigilant as they exercise their discretion to avoid managerial ineptitude, which leads to weak financial performance and wears away potential investors confidence. Mugobo et al (2016) present evidence that in advanced economies, ownership structure is largely dispersed while the ownership structure in developing nations is highly concentrated. They observed that largely absorption of ownership structure is a product of porous legal system in developing nations, which exposes minority shareholders' interest to financial risk.

A majority of quoted firms in Sub-Sahara Africa bourses have mixed forms of ownership, the main forms of ownership are; government, block, institutional, foreign,

and managerial ownership that impacts the profitability of the firms either positively or negatively high ownership concentration stands out as a common characteristic of listed firms at the respective bourses. This consequently empowers controlling shareholders to impose power by selectively choosing to undertake activities with an intent of obtaining personal gain. This comes at the expense of marginal shareholders, (Mudi, 2017; Adebiyi and Kajola, 2011). Based on the researchers' understanding, only the work of Munisi and Randy (2013) recently employed the dynamic–GMM to investigate the effect of concentrated rights on the performance of companies in Sub-Saharan African countries. This study however built on this previous research to focus on the impact of ownership structure on the profitability of manufacturing companies in Sub-Saharan African nations for a period of 10 years (2010 to 2019). The justification for this time frame is based on economic globalization regarded as one of the strong motives after the major financial modifications in various Sub-Saharan African Countries, an era of global competitiveness among manufacturing firms in the region. The geographical scope selected for this study are Nigeria, Kenya, and South-Africa – the reason for this is centered on the fact that the Nigeria bourse in terms of market capitalization is the third biggest bourse in the continent with a total market capitalization of over 13 trillion Naira (Nigeria Stock Exchange, 2018). The Johannesburg bourse is presently rated the 19th biggest stock exchange in the globe by market capitalization and the biggest bourse in Africa (JSE.CO.Za, 2018). Nairobi Stock Exchange has grown to become the continent's fourth-largest exchange by trading volume and fiftieth largest by market capitalization as a ratio of GDP (Nairobi Stock Exchange, 2018).

The rationale for this study is to determine the effect of different ownership structures (government, block and institutional) on two performance measurement variables (return on assets and Tobin q) with emphasis on quoted manufacturing firms of three selected SSA economies. The data analysis of the study was on the assessment of changes in the financial performance arising from adoption of different ownership structures. Besides, this study adopts the system Generalized Method of Moment (GMM) technique (an active panel data models which pools moment settings for the differenced equation with moments settings for the models in ranks) as a departure from the multiple regression technique commonly found in extant literature. The uniqueness of this study also focus on aggregate analysis of three SSA countries as different from previous studies with emphasis on individual country analysis. The comparative analysis of the two performance variables (ROA and Tobin Q) to determine the best and superior performance measure of manufacturing firms is another significant contribution of this study to extant literature.

The remainder of this study is organized as follows. Section two reviews the relevant literature and previous studies related to this study. Section three describes the methodologies adopted for the studies including the model formulation and data analysis techniques. In section four, the main empirical test results were presented and interpreted while section five summarizes the empirical findings and concludes the study.

2. Literature Review

2.1. Ownership Structure

Ownership structure is a vital internal corporate governance component where principals can scrutinize and oversee the operations of the company to safeguard their investment, (Madhani, 2016). It signifies the proportion of equity owned by single shareholder and huge

block shareholders (individuals that hold minimum 5% of shares within the firm). According to Maina (2014), Benjamin & Dirk (2015) and Nahila & Amarjeet (2016) concentrated ownership is defined by the distribution of stakes in relation to the distinctiveness of the equity holders and its classification within company's governance structure that has impacted firm financial performance for several decades. Jiang (2015) recommends that since rights concentration is an important component in present company's governance structure, there should be a departure of firm ownership from firm management. Three basic types of ownership concentration have been identified in the extant literature. *Block ownership concentration:* This is when a proportion of a firm's equity is acquired by major equity holders. *Government ownership concentration:* A situation in which large proportion of equities and controlling shares of a firm is owned by government. This ownership structure is enhanced through political appointment of the managers. *Institutional ownership concentration:* These are organizations that own huge sums of resources to invest and they do commit huge amount of funds into a firm's equity e.g. pension reserves, insurance firms, mutual funds and combined performance is termed as the neutrality assumption.

2.2. Relationship between ownership concentration and performance of firms: Empirical Review

Ownership structure can be along two scopes: rights acquisition and ownership mix. Right acquisition implies stakes of the biggest shareholder while ownership mix is the allotment of company's equity with reference to the distinctiveness of the biggest equity holders. Gonzalez and Molina (2010) noted that superior rights-acquisition enhances company's profitability and concluded that rights structure is the essential factor that impacts firm's ownership and supervises resources distribution, and it has a huge effect on firm performance. Though according to Friedman (1953), Saunders *et al* (2000), firms operate uniformly well under various rights settings since competition in the market will reduce all ineffective forms in the long run. Therefore, there is no influence of rights structure on profitability; an ideal rights structure and profitability depend on the environment.

Malik (2011) conducted a study on the influence of rights concentration on risk and growth in USA non-financial companies with a sample size of 187 firms, the variance in equity/profit ratio was used as an indicator of risk while its dependency was tested on ownership concentration. The findings of the study showed an insignificant positive correlation between firms coordinated by managers as opposed to firms controlled by owners and in addition a high variance in profit/equity. Garcia and Sanchez (2011) examined the correlation among ownership structure and profitability of companies by employing a non-balanced panel consisting of 76 firms in the Spanish bourse between 1999 and 2002, the study employed piecewise OLS and 2SLS regression with random effects. The outcome of the study specified the presence of a quadratic correlation among Tobin Q and large shareholdings.

Santamaria and Azofra (2011) carried out an examination on the association for ownership structure and corporate profitability of eighty banks in Spain. Employing panel data collected between 1996 and 2004, analyzed by Generalized Methods of Moments, the study found a point of departure for voting rights and the larger shareholders cash flow for smaller firms by ROA. The study was well conducted with reference to financial ratios determining bank performance.

Similarly, Adebiyi and Kajola (2011) examined the correlation between rights structure and firm performance in Nigeria, using a sample of thirty listed companies from 2001 to 2008,

using pooled OLS, the outcome being a significant negative association among rights structure and performance of the company. Wanjiku (2014) investigated the effect of ownership structure on profitability of sixty-three quoted companies at the NSE between 2010 to 2014. The researcher employed both cross-sectional and descriptive survey method to allow for evaluation of the results of the research. The study found that ownership concentration alleviates conflicting interest between managers and owners thus promoting improved monitoring.

Mutisya (2015) examined the correlation among investors shareholding and firm profitability by adopting a descriptive research design of sixty-four listed companies on the NSE from 2010 to 2014. Multiple regression analysis results reported a weak positive correlation as the outcome of the study. Mugobo *et al.* (2016) investigated the influence of company's control through ownership structures; rights acquisition, state ownership and administrative ownership on firm profitability. A multiple regression analysis was used on sampled data gathered over ten years from 2001 to 2010 for eighty south Africa firms with ROA as indicator for profitability. Findings revealed a positive relationship between rights acquisition and profitability of the firm. Mudi (2017) investigated the influence of rights structure on profitability of firms quoted on the NSE. It employed descriptive survey and longitudinal research design of fifty-two companies quoted on the NSE between 2011 and 2016. The research found out that rights acquisition has a huge influence on firm profitability.

Paniagua, Rivelles & Sapena (2018) studied firms' performance with different ownership structure of US firms using generalized non-linear equation technique. The study found that ownership structure has negative relationship with profitability ratio. Kao, Hodgkinson & Jaafar (2018) used data of Taiwan listed firms to study the relationship between ownership structure and firm value using panel estimation and 2SLS. The study found that ownership structures are positively related to firm value. In the same vein, Alabdullah (2018) studied the relationship between ownership structures and firm performance of Jordan non-financial firms listed on Amman stock exchange. The multiple regression results showed that managerial ownership has a positive impact performance but no significant impact of foreign ownership on performance.

Sadiq, Othman & Ooi (2019) studied the relationship between managerial ownership and firm performance of firms listed on Bursa Malaysia with the aid of single equation model. The study found limited evidence showing the non-linear relationship between firm performance and managerial ownership. Feldman, Amit & Villalonga (2019) also explored the non-linear relationship between managerial ownership and firm profitability of 350 firms using linear regression. They found a positive relationship between ownership structure and Tobin's Q for board ownership of between 0 and 5% and negative relationship for board ownership of between 5 and 25%. Dakhlallh, Rashid, Abdullah & Dakhlallh (2019) used pool mean estimates to study the effect of ownership structure on firm performance of 180 selected Jordan firms. The empirical results showed that ownership structure has a significant effect on the performance of the selected firms.

Established on the extensive and robust empirical review above, it is clear that ownership acquisition and firm performance have been largely explored from diverse perspectives and methodologies. These methods are largely part of conventional techniques regrettably, these approaches have their drawbacks and demerits in that they are sensitive to outliers, focuses on the mean of the dependent variables, the test statistics might be unreliable when data is not normally distributed. This study however adopts the system Generalized

Method of Moment (GMM) technique. Accordingly, the system GMM technique is an active panel data model which pools moment settings for the differenced equation with moments settings for the models in ranks which can make assessment most effective. This technique supports the premise that the first difference of instrumental parameters for rank parameters is not connected with unobserved specific effects, that is an indication that the difference of scheduled parameters can be used as a tool for rank equations.

3. METHODOLOGY

The study adopts the causal research design to investigate the impact of ownership concentration on firm performance of selected manufacturing firms in Sub-Sahara Africa countries. All quoted manufacturing firms listed on the Stock Exchanges of the three selected Sub-Sahara Africa countries (Nigeria, Kenya and South Africa) constitute the population of this study while a sample of one hundred manufacturing firms were purposively selected from each country based on data accessibility and the requisite information for the period (2010-2019) under study. The relevant data for this study were obtained from the various audited financial statements of sampled manufacturing firms with the system Generalized Method of Moment (GMM) technique as the main analytical technique for determining the effect of different ownership structure on two different performance measurement variables.

3.1. Model Specification

This study employs two specific models such as book-keeping base performance and the market base performance indicators. The model incorporating measures (ROA and Tobin Q) and decomposing ownership concentration into various variables (government ownership, block ownership, institutional ownership) to suit the study is stated in a functional form as follow:

$$ROA = f(GOWN, BLOWN, INOWN, ASSETS, AGE) \quad (1)$$

$$TOBINQ = f(GOWN, BLOWN, INOWN, ASSETS, AGE) \quad (2)$$

The econometric form of the models is stated below as:

$$ROA_{it} = \beta_0 + \beta_1 GOWN_{it} + \beta_2 BLOWNi_t + \beta_3 INOWN_{it} + \beta_4 ASSETS_{it} + \beta_5 AGE_{it} + U_t \quad (3)$$

$$TOBINQ_{it} = \alpha_0 + \alpha_1 GOWN_{it} + \alpha_2 BLOWN_{it} + \alpha_3 INOWN_{it} + \alpha_4 ASSETS_{it} + \alpha_5 AGE + U_t \quad (4)$$

Where:
GOWN = Government Ownership; BLOWN = Block Ownership
INOWN = Institutional Ownership; ASSETS = Total Asset
AGE = Age of Firm; ROA = Return on Assets, TOBIN Q = Tobin Q
Where i represent companies in all sample and t represents the scope or period of study.

β_0 to β_5 are coefficients of the variables to be appraised and U_t is the error term.

Hence the GMM model specification is:

$$ROA_{it_{t-1}} = \beta_t + \sum_{j=1}^{m} \beta_j ROA_{t-1} + \sum_{j=1}^{m} \beta_j GOWN + \sum_{j=1}^{m} \beta_j BLOWN + \sum_{j=1}^{m} \beta_j INOWN +$$

$$\sum_{j=1}^{m} \beta_j ASSETS + \sum_{j=1}^{m} \beta_j AGE + \varepsilon_{it} \quad (5)$$

$$TOBINQ_{it_{t-1}} = \alpha_t + \sum_{j=1}^{m} \alpha_j ROA_{t-1} + \sum_{j=1}^{m} \alpha_j GOWN + \sum_{j=1}^{m} \alpha_j BLOWN + \sum_{j=1}^{m} \alpha_j INOWN +$$

$$\sum_{j=1}^{m} \alpha_j ASSETS + \sum_{j=1}^{m} \alpha_j AGE + \varepsilon_{it} \quad (6)$$

Operationalization of Variables: The definitions of the parameters in the model as well as their measurement, expectations and sources of data are stated in Table 1

Table 1 Definition of Variables and Sources of Data Employed in Regression Analysis

Variable	Type of variable	Definition and measurement	*A priori* Expectation
Return on Asset (ROA)	Dependent	ROA= Profit after tax/Total Assets	
Tobin's Q (TQ)	,,	Total market value of equity-total liability /Total Asset	
Institutional Ownership	Independent	The sum of 5% corporate ownership	(+)
Block Ownership	,,	The sum of all 5% major share ownership	(+)
Government Ownership	,,	The sum of all 5% and above government shares holding	(+)
Firm Age	,,	The number of years from the day the firm was established till 2017	(+)
Assets	,,	Current assets +fixed assets	(+)

Source: Authors' compilation (2020).

4. Data Analysis and Interpretation

Stationarity Test: From the stationarity tests results (Table 2), all the variables under consideration are characterized by first-order integration thus the panel estimations reveal a common unit root process. This further validates the suitability of our choice of estimation techniques since the theoretical built up is predicated on stationarity assumption. The stationarity test follows the Levin, Lin and Chu (which assumes homogeneity in the dynamics of the auto regression coefficients for all panel members); Im, Pesaran and Shins. Basically, the study adopts the Im, Pesaran and Shin as well as Levin, Lin and Chu unit root tests approaches. From the stationarity test results, all the parameters employed in this study were found to be stationary, although not at levels, but at first difference I(1). Thus, the variable defined in our dynamic panel modelling approach; GMM, are in line with the recommendation of Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998), that variables of the GMM specifications must be stationary in their first difference.

Panel Co-Integration Test: The co-integration result (Table 2) shows evidence of a co-integrating association among the variables in both models as reported by the significance of the Fisher statistics from Trace test as well as that from Max-Eigen test. Specifically, From the ROA equation, Trace test indicates 6 co-integrating equations at both 5% and 1% levels, while Max-eigen value test indicates 2 co-integrating equations at both 5% and 1% levels. Also, from the TOBINQ model, Trace test indicates 6 co-integrating equations at both 5% and 1% levels, while Max-eigen value test indicates 2 co-integrating equations at both 5% and 1% levels. The result indicates that the parameters used in the study are all significant at the conventional test levels as shown in Panel A and B of Table 2.

Table 2 Stationarity Test at First Difference- The Levin, Lin and Chu; Im, Pesaran and Shin Approach

Variables	Levin, Lin and Chu			Im, Pesaran and Shin W-stat		
	Null Hypothesis: Unit root (assumes common unit root process)			Null Hypothesis: Unit root (assumes individual unit root process)		
	Stat	Prob	Remark	Stat	Prob	Remark
AGE	-2.07	0.02**	I(1)	-5.00	0.05**	I(1)
BLOWN	-7.92	0.00***	I(1)	-4.75	0.00***	I(1)
GOWN	-7.93	0.00***	I(1)	-3.45	0.00***	I(1)
INOWN	-7.51	0.00***	I(1)	-4.54	0.00***	I(1)
ASSETS	-7.11	0.00***	I(1)	-3.68	0.00***	I(1)
ROA	-16.70	0.00***	I(1)	-8.15	0.00***	I(1)
TOBINQ	-19.44	0.00***	I(1)	-9.16	0.00***	I(1)

NB: *Significant at 10%, **Significant at 5%,***Significant at 1%.
Source: Authors' Computation, 2020

Table 3 Johansen-Fisher Co-Integration Test Results

PANEL A: Fisher Statistics from Trace & Max-Eigen Test Result for ROA Model Variables							
Variables	Hypothesized No. of CE(s)	Trace Statistic	5% Critical Value	1% Critical Value	Max-Eigen statistic	5% Critical Value	1% Critical Value
Series:	None	183.69**	94.15	103.18	60.62**	39.37	45.10
AGE	At most 1	123.07**	68.52	76.07	40.76**	33.46	38.77
BLOWN	At most 2	82.31**	47.21	54.46	25.49	27.07	32.24
GOWN	At most 3	56.82**	29.68	35.65	22.39	20.97	25.52
INOWN	At most 4	34.43**	15.41	20.04	19.15	14.07	18.63
ASSETS ROA	At most 5	15.28**	3.76	6.65	15.28	3.76	6.65
PANEL B: Fisher Statistics from Trace & Max-Eigen Test Result for TOBINQ Model Variables							
Variables	Hypothesized No. of CE(s)	Trace Statistic	5% Critical Value	1% Critical Value	Max-Eigen statistic	5% Critical Value	1% Critical Value
Series:	None	168.72**	94.15	103.18	48.47**	39.37	45.10
AGE	At most 1	120.25**	68.52	76.07	41.07**	33.46	38.77
BLOWN	At most 2	79.18**	47.21	54.46	24.23	27.07	32.24
GOWN	At most 3	54.96**	29.68	35.65	20.60	20.97	25.52
INOWN	At most 4	34.36**	15.41	20.04	18.08	14.07	18.63
ASSETS TOBINQ	At most 5	16.28**	3.76	6.65	16.28	3.76	6.65

Source: Authors' Computation,2020 NB: *(**) denotes rejection of the hypothesis at the 5%(1%) level

Discussion of Findings and Policy Implication

The panel estimation results for this study are reported in Table 4. The Hausman specification test reported in the lower segment of Table 4 fails to reject the random-effects model in favor of the fixed effects model. The implication of the above finding is that some parameters may be fixed over time, but vary between countries, and others may be fixed among countries, but vary over time. The inference that can be derived from the Hausman specification test is that the Random-effects model is favored to the Fixed-effects model for the levels regression estimates for the ROA model. On the other hand, the result from the traditional panel estimation for TOBINQ model as reported in Table 5 rejects the random-effects model in preference for the fixed effects model.

Also, results of the dynamic model for ROA are presented in the second part of the Table 4, while results of the dynamic model for Tobin's Q are reported in the first part of the Table 5 respectively. The outputs from the second-order serial correlation test for both equations (from the Arellano-Bond test) indicate that residuals from the dynamic panel equation are not serially correlated. This further implies that the instrumental variables employed in estimation are valid and unbiased. The p-value of the Sargan test is judiciously large for both models. Thus, we fail to reject the null hypothesis at 1% level, that the set of instruments we used in GMM for both the ROA and TOBINQ models are correctly specified. Hence, that there are no problems of misspecification with the set of instruments incorporated into our GMM identity. In addition, all the series incorporated into the dynamic panel model are utilized at first difference, and this follows the prescription of Arellano and Bond (1991).

From the results in Table 4, the coefficient of one-period lagged value of ROA was positive and significant statistically at 1% in the dynamic panel model and is in consonance with our *a priori* expectation (similar to the result of TOBIN Q in Table 5). Precisely, the outcome reveals that a unit increase in the TOBIN Q of Sub-Sahara African countries in the previous year will lead to a corresponding increase in firm profitability (proxies by ROA and Tobin's Q) of the entire region in the current year by 0.18 unit. The implication of the above findings is that previous year performance has the tendency to positively influence both current and future performance behavior of the manufacturing sector in Sub-Sahara Africa. This suggests that the impact of the previous shocks in financial performances among manufacturing firms in Sub-Sahara African countries create positive spill-over effects, which translate into present circumstances and future opportunities of the region.

In addition, the coefficient of Government ownership concentration was positive in the random and fixed effects models, the GMM model from the TOBIN Q equation as well as the fixed effects model from the ROA equation. This finding further substantiates earlier findings of Netter & Megginson (2001) and Boubakri & Cosset (2005) who argue that government owned firms are advantaged as the government can allocate capital to them for investment to prompt financial and economic development, mostly for nations that have economic institutions that are underdeveloped and are undertaking government funds for projects with social benefits. Ongore and K'Obonyo (2011), Mrad and Hallara (2012) and Munisi & Randy (2013) further posit that, government retains some ownership in privatized firms to boost shareholder confidence, investment protection and managerial monitoring.

It however turned adverse in the case of random effects model as well as the GMM Panel Data Estimation Results from ROA Model. This further confirms previous findings of Ongore and K'Obonyo (2011), Mishari (2012), Alulamusi (2013) and Mutisya (2015)

who observe that government ownership is inefficient, characterized by bureaucratic bottlenecks and the ownership rights of government firms do not have clear incentives to improve firm performance.

Also, the coefficient of the two-period lagged value of Government ownership concentration was positive in all panel estimation results from the ROA model. Though, it was only significant at 1% level in the fixed effects model. Furthermore, the coefficient of Block Ownership concentration was negative in the ROA random effects and dynamic panel models, while it was found to be positive in all estimations for the Tobin's Q model as well as the ROA fixed effects model. In addition, it was statistically relevant at 1% level in estimating both the ROA and Tobin's Q fixed effects models as well as the dynamic panel model for Tobin's Q relations, while it only became significant statistically at 10% level in the ROA dynamic panel model and Tobin's Q random effects model, respectively. Our results on the positive impacts of Block ownership concentration on firm's profitability further conform to previous findings of Holderness and Sheehan (1988), Morck *etal* (1988), Wruck (1989), Gorton and Schmid (1996), and Shleifer and Vishny (1997) who emphasize that a high acquisition of equity tends to create more pressure on agents to behave in certain ways. Similarly, the coefficient of one-period lagged value of Block ownership concentration was positive in both random effects and panel estimation results from the ROA model, while it was found to be negative in all estimations for the Tobin's Q model as well as the ROA fixed effects model. It was statistically significant at 1% level in both the ROA fixed effects model and the dynamic panel estimations from the Tobin's Q model respectively. Likewise, the coefficient of the two-period lagged value of Block ownership concentration, though, only significant at 1% in the fixed effects model, was negative in all panel estimation results from the ROA model. In addition, the coefficient of Institutional Ownership acquisition was positive in the ROA random effects and dynamic panel models. This is in line with previous findings of Rhoades (2000); Elyasiani and Jia (2010); Mishari (2012); Gayan and Ishari (2016) who believe that supervision by institutional shareholders is mostly to lead to improved company profitability because, as sophisticated and major investors, institutional shareholders have the strength and expertise to supervise organization at low cost, and capability to wield enough authority to change the control formation and the firms path of operations. However, it was found to be negative in all estimations for the Tobin's Q model as well as the ROA fixed effects model respectively. Interestingly, it was statistically significant at 1% level in the ROA fixed effects model as well as the Tobin's Q fixed effects and GMM models respectively. Although, it only attained statistical significance at 10% level in the ROA GMM and Tobin's Q random effects models respectively. In the same way, the coefficient of one-period lagged value of Institutional ownership concentration was negative in both random effects and panel estimation results from the ROA model, while it was found to be positive in all estimations for the Tobin's Q model as well as the ROA fixed effects model. Also, it was statistically significant at 5% level in the determination of profitability of the selected manufacturing that are value-optimizing companies in the Sub-Sahara Africa region from the dynamic panel estimation result for TOBINQ Model and 10% level in both ROA and Tobin's Q fixed effects models. A positive coefficient ensued in all panel estimations for the ROA model in the case of the association between manufacturing performance and two-period lagged value of Institutional ownership concentration. However, this was only significant at 1% level in the ROA fixed effects model.

Table 4 Panel Data Estimation Results for ROA Model (Sub-Sahara Africa)

Variables	Random Effect Model			Fixed Effect Model			Panel GMM Model		
	Coeff	t-stats	Prob	Coeff	t-stats	Prob	Coeff	t-stat	Prob
C	3.68	0.88	0.38	16.6	8.40	0.00***	-	-	-
ROA(-1)	-	-	-	-	-	-	0.21	3.85	0.00***
GOWN	-3.26	-9.13	0.00***	0.04	0.73	0.47	-2.91	-7.00	0.00***
GOWN(-1)	2.33	3.99	0.00***	-0.29	-3.88	0.00***	1.28	1.88	0.06*
GOWN(-2)	0.77	1.42	0.16	0.15	2.68	0.01***	0.37	0.60	0.55
BLOWN	-0.61	-1.36	0.17	0.35	4.90	0.00***	-0.53	-1.64	0.10*
BLOWN(-1)	0.45	0.72	0.47	-0.20	-2.69	0.01***	0.55	1.46	0.15
BLOWN(-2)	-0.21	-0.42	0.67	-0.21	-4.02	0.00***	-0.35	-1.35	0.18
INOWN	0.60	1.26	0.21	-0.36	-4.83	0.00***	0.60	1.80	0.07*
INOWN(-1)	-0.48	-0.72	0.47	0.15	1.79	0.07*	-0.67	-1.58	0.12
INOWN(-2)	0.29	0.54	0.59	0.29	5.48	0.00***	0.34	1.07	0.29
ASSETS	0.00	0.83	0.41	0.002	3.53	0.00***	0.002	3.33	0.00***
AGE	-0.01	-0.09	0.93	-0.47	-6.69	0.00***	-0.38	-2.75	0.01***
No. of Observation		239			239			209	
R-Square		0.27			0.76				
Adjusted R-Square		0.23			0.71				
F-Statistics (prob)	7.55(0.00)***			15.77 (0.00)***					
Hausman Test	Chi^2 (11) = 21.10 (0.0323)								
Sargan Test	Chi^2(12)=16.514(0.16)								
Test for Second Order Autocorrelation	Z=0.5998(0.549)								

NB: *Significant at 10%, **Significant at 5%,***Significant at 1%. (Author Comp.2020)

Table 5 Panel Data Estimation Results for TOBINQ Model

Variables	Panel GMM Model			Random Effect Model			Fixed Effect Model		
	Coeff	t-stats	Prob	Coeff	t-stats	Prob	Coeff	t-stat	Prob
C	-	-	-	2.23	3.33	0.00***	2.41	9.12	0.00***
TOBINQ(-1)	0.18	17.18	0.00***	-	-	-	-	-	-
GOWN	0.01	0.28	0.78	0.02	0.42	0.67			
0.03	8.97	0.00***							
GOWN(-1)	-0.01	-0.59	0.56	-0.08	-1.76	0.08*	-0.04	-4.37	0.00***
BLOWN	0.10	8.39	0.00***	0.09	1.85	0.07*	0.03	11.52	0.00***
BLOWN(-1)	-0.04	-2.99	0.00***	-0.01	-0.10	0.92	-0.01	-0.81	0.42
INOWN	-0.12	-8.61	0.00***	-0.09	-1.82	0.07*	-0.03	-15.59	0.00***
INOWN(-1)	0.03	2.42	0.02**	0.01	0.13	0.90	0.01	1.70	0.09*
ASSETS	0.00	-56.47	0.00***	0.00	-3.45	0.00***	0.00	2.60	0.01***
No. of Observation		239			269			269	
R-Square					0.08			0.872	
Adjusted R-Square		0.23			0.053			0.852	
F-Statistics (prob)						2.887(0.00)***		15.77 (0.00)***	
Hausman Test	Chi^2(8)=35.543(0.00)								
Sargan Test	Chi^2 (21) = 27.95(0.14)								
Test for Second Order Autocorrelation	Z = 1.26(0.21)								

NB: *Significant at 10%, **Significant at 5%,***Significant at 1%.

Source: Authors' Computation, 2019

5. Findings and Conclusion

The results obtained in the empirical analysis of this study were found to be robust to both specification and data interpretation. The general outcome implies that rights acquisition essentially has huge influence on performance of manufacturing firms. More specifically,

both government and block ownership structures have a huge negative effect on performance of manufacturing firms in Sub-Sahara Africa countries while institutional rights ownership has a significant direct effect on performance of manufacturing companies in Sub-Sahara Africa countries. However, based on market base measurement (Tobin Q) model, both government and block ownership structure have significant direct effect on the performance of manufacturing firms in Sub-Sahara Africa countries. Institutional ownership concentration however has a significant negative effect on profitability of manufacturing firms in Sub-Sahara Africa countries. Total Assets has a significant positive impact on performance of manufacturing companies in Sub-Sahara Africa countries. Firm's Age has an adverse significant effect on profitability of manufacturing companies in Sub-Sahara Africa countries. It is worthy to note that on the basis of comparison between the two indicators of profitability of manufacturing firms in SSA countries, the market base valuation model is a better measure based on the findings above. This finding is mostly important because it has shown that there is no one best financial performance measurement at all time, the uniqueness of the situation will enable corporate managers of manufacturing firms to know the best performance measurement variable to adopt when analyzing their firm performance in relation to ownership structure.

CONCLUSION

This study investigates the effect of ownership structure on the financial performance of listed manufacturing firms in three Sub-Saharan Africa countries (Nigeria, Kenya and South–Africa) using the system Generalized Method of Moment (GMM) technique of data analysis. Generally, our findings show that there was a robust relationship among rights acquisition and profitability of listed manufacturing firms sub-Sahara Africa. Therefore, it can be concluded that different ownership structures were statistically significant in influencing the performance of manufacturing companies quoted in the respective bourses of selected Sub-Sahara Africa economies this conclusion corroborates the conclusion of Alabdullah (2018), Feldman et al (2019) and Dakhlallh et al (2019) whose respective studies also conclude that ownership structures significantly influence the performance of firms, but contradict Paniagua et al (2018) whose study concludes that ownership structure has negative relationship with profitability ratio. Ownership structure of manufacturing firms has been embraced by most firms and has taken center stage of most economies in the world. This is so because it helps in building an efficient and robust corporate governance which can enhance performance of the individual manufacturing firm and lead to the overall growth of the various national economies. In order to gain extensively from the benefits of an effective corporate governance mechanism, regulatory agencies of SSA countries should put in place different institutional reforms that will help in carrying out operational activities within the SSA region with little or no stringent rules that can help manufacturing firm operate efficiently.

This study contributes to extant literatures by employing the system GMM technique which provides a framework within which the relationship between ownership structure and financial performance were considered. Besides, the study also compares the impact of different ownership structures on different measures of financial performance thereby revealing which type of structure has the most significant influence on which performance measure especially when considering manufacturing firms in SSA context.

This study being an aggregate cross-country study encountered the limitation of heterogeneity in data collection and measurement. This problem arose because of the different data computational techniques across the SSA countries, however, the system GMM estimator was able to produce less bias and more precise data estimate.

RECOMMENDATIONS

The results from the empirical analysis provide strong background and inferences for certain policy and practical recommendations for practitioners and policy makers. In the first place, the study shows that a long run correlation occurs among ownership concentration and profitability among the manufacturing firms in SSA region. Thus firms need to consider corporate governance as a long run strategy for promoting growth and other forms of expansions. Since the study has shown that the impact of rights acquisition differs on the basis of possession dimension, there is need for investors to consider the area of interest before engaging in investment. The regulatory agencies within each of the countries in the region should also consider providing enabling environment for encouraging intra-regional integration for manufacturing firms to enhance operational activities.

The future direction of research in this study is dynamic in the context that there is need to consider the influence of dispersed ownership together with ownership structure with regards to the effect of both forms of ownership on firm performance. Besides, financial sector development indices may also be included in future studies models. Also econometrically, further study can use non-linear (as different from linear equation adopted in this study) single equation model to test the relationship between ownership structure and financial performance of manufacturing firms.

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VLASNIČKA STRUKTURA I FINANSIJSKE PERFORMANSE PROIZVODNIH KOMPANIJA U PODSAHARSKOJ AFRICI

Ovaj rad istražuje uticaj vlasničke structure na finansijske performanse navedenih proizvodnih kompanija u tri podsaharske zemlje (Kenija, Nigerija, Južnoafrička Republika) na osnovu indeksa kritilčne mase na njihovim orgovarajućim berzama. Relevantni podaci iz finansijskih izveštaja uzrokovanih firmi su analizirani uz pomoć ko-integracionog testa i GMM sistema za period 2010-2019 korišćenjem ROA i Tobin-Q kao zavisne varijabile dok su objašnjenja varijabile bila državno vasništvo, zajedničko vlasništvo i institucionalno vlasništvo. Empirijski rezultati su otkrili da sve objašnjavajuće varijabile imaju značajnog uticaja na indikatore performansi (ROA, TOBIN Q). Rezultati provere robusnosti su takođe otkrili da koncentracije i državnog i institucionalnog vlasništva imaju dominantno negativni uticaj na finansijske performanse navedenih zemalja dok je koncentracija blok vlasništva u velikoj meri pozitivna za većinu proizvodnih kompanija. Studija preporučuje donosiocima odluka da stvore povoljne politike koje bi ohrabrile balansirano insvestiranje od strane svih kategorija investitora i obezbede da samo onih nekoliko vlasnika koji imaju neophodna stredstva da diverzifikuju i privuku veštine i kompetrencije poboljšaju performanse preduzeća. Vlada takođe treba da zadrži neki udeo u vlasništvu domaćih i stranih firmi da bi povećala poverenje akcionara.

Ključne reči: *vlasnička struktura, proizvodne kompanije, performanse, GMM*

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Review Paper

TARGET COSTING SUITABILITY FOR IMPROVEMENTS OF LEAN SUPPLY CHAINS

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Abstract. *Competitive advantage can be seen as the superiority of some market participants to properly use resources and utilize key competencies to deliver greater value than competitors, without compromising product quality and functionality. In that sense, accounting, especially management accounting, successfully responds to managers' needs for information that will be their adequate support in strategy implementation. Lean concept and target costing are just some of the concepts whose strategic orientation can be a good support to managers. The aim of this paper is to point out the similarities and differences between lean concept and target costing and to show on a practical example how these concepts bring business improvements in supply chain.*

Key words: *lean concept, target costing, cost reduction, improvement*

JEL Classification: L11, M41

INTRODUCTION

Increased competition on the national and foreign markets, rapid technological development, diverse customer needs, as well as shorter product life cycle have led to the spread of the lean concept outside the company itself. Spreading principles of lean concept means redefining the corporate strategy and identifying the key processes that take place in the company.

Lean concept was implemented at Toyota for the first time in the 1950s and was aimed at building a continuous flow of value creation, while eliminating non-value-added activities in order to speed up the production cycle. It eliminated non-value-added activities and paid more attention to improving value-added activities. The company processes are connected in a

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continuous flow, the work is reorganized through teams made up of people from different sectors and there is constant striving for improvement. This aspiration is driven by savings in human resources, space, machinery, time and cost reduction to meet the desires and needs of demanding consumers. Initially, the lean concept was applied in the field of production, and later spread to other organizational parts of the company as well as to the relationships that the company establishes with partners outside the company.

In order to take advantage of the lean concept, it is possible to combine it with some other concepts. Among others, the concept that fits lean requirements is target costing. Target costing was primarily applied as a cost control technique to eventually grow into an all-encompassing concept aimed at profitability management. Although it has had a predominant focus on the costs incurred in the product design phase, this concept also considers the costs incurred throughout the product life cycle as well as in the entire supply chain. Specifically, it aims to reduce costs in different phases of the production cycle of the company through the analysis of costs of each phase and the improvement of technological and production character. Due to its information suitability and numerous tools, this concept has grown into a powerful strategic instrument for profit management and planning. Target costing helps managers produce new product with price that the market accepts and ensure a certain margin and rate of return, as well as increase consumer satisfaction.

In that sense, the paper is divided into three parts. The first part of the paper points out the basics of the lean concept. The second part of the paper highlights the similarities and differences between the lean concept and target costing. Finally, a practical example shows how the application of these two concepts brings business improvements in lean supply chain.

1. EXTENDED APPLICATION OF LEAN CONCEPT

Lean concept was primarily applied in the production process. Numerous benefits observed from the application of the lean concept in the production process quickly gained the attention of the scientific and professional community, as well as the managers of the world's leading companies. In that sense, the lean concept began to be applied in the whole company. This is because the need to reduce or, if possible, eliminate waste and non-value-added activities in human resources, inventory, time to order the required information/ products/services, business premises, etc. existed in almost all organizational parts of the company, from those central to product delivery to supporting parts (Kovacheva, 2010). The extended application of the lean concept to all organizational parts of the company has led to the formation of a new business organization called the lean enterprise (Womack & Jones, 1994). The lean enterprise is a group of individuals who, in a connected and synchronized manner, perform activities in a more efficient and economical way with the aim of quickly responding to the requirements of the next process or organizational part and deliver the required value. The goal is to analyze and direct the "value stream" in order to include as many activities as possible that focus on production and service delivery that provide maximum value. In that sense, it is important to focus on the company performance as a whole, rather than the performance of individuals, functions and organizational parts.

The formation of lean enterprise implies the application of five basic principles to all processes and organizational parts of the company. The first business principle is to define values. External value definition becomes the premise which the company relies

on. End consumers define the value and the company should try to best meet their needs and delivered required value. In an enterprise, the next stage of a process represents the end user of materials or information. Establishment of "value streams" in the company is the second principle of the lean business concept. The "value streams" that are established in the company refer to the entire business process, not only to the production process. Of course, in the company it is necessary to determine which are the key activities and processes that are performed and which deliver the required value, so they should be included in the value stream. Properly established "value streams" in the company enable the elimination of non-value-added activities, eliminate waste, downtime, reduce defects and the like. Properly established "value streams" ensure the removal of all obstacles and smooth flow of information, documentation and necessary materials to their users, which is the third principle of the lean business concept. The fourth principle refers to the introduction of a pull system. The signal to provide the necessary information is sent by the end consumer/user. The last principle is the pursuit of perfection. When "value streams" are established and their smooth functioning is ensured, the goal is to achieve the best possible functioning of the company as a whole. Here, the emphasis is primarily on key processes, but chances for improvement are also sought in the supporting processes (Novićević Čečević & Djordjević, 2020).

Key processes include processes that are directly related to the delivery of value required by consumers and processes that are not directly involved in value creation, such as integration with suppliers. The inclusion of processes related to establishing relationships with partners in the company strategy is important to ensure product quality and achieve a competitive advantage for the company. By applying the lean principle outside the company, a lean supply chain is created.

Lean supply chain refers to activities, functions and processes that take place not only in the company but also in all Upstream Activities and Downstream Activities. It includes suppliers, manufacturers, distributors and end consumers. The goal of a lean supply chain is to optimize the services provided, minimize costs, and maximize flexibility (Gallone & Taylor, 2001). The nine-zero concept derived from the lean concept can be used to achieve the goals of the lean supply chain. The nine-zero concept implies (Charron et. all, 2015):

- Zero dissatisfaction of partners,
- Zero non-compliance,
- Zero bureaucracy,
- Zero dissatisfaction of stakeholders,
- Zero delayed information,
- Zero waste,
- Zero non-value added activities,
- Zero errors and defects and
- Zero missed chances.

Some of the features of the lean supply chain are efficient communication and information transfer, synchronization of flows, elimination of waste, establishing a close long-term relationship, ensuring transparency, managing uncertainties and risks, striving for innovation and new knowledge and low inventory (Ugochukwu, Engstrom, & Langstrand, 2012). The formation of a lean supply chain is a key basis for achieving and improving competitive advantage. In this regard, special attention should be paid to the choice of partners for a particular lean supply chain. When selecting a partner for a lean supply chain, certain criteria must be respected. These criteria relate to the behavior and attitude of both suppliers and

consumers, the quality they deliver, the capacity they possess and the ability to deliver on time, payment terms and costs (Harris, Harris, & Streeter, 2011) (Jeffrey, 2004).

The first criterion for selecting participants in the value chain is the behavior and attitude of the partner. The attitude and behavior of the partner implies their attitude towards the company with which they establish partnership, as well as towards changes and improvements. If the partner has a positive attitude about the company, they will want to establish long-term partnerships with it. However, if the partner does not have a positive attitude towards the company, in order to deliver the value demanded by consumers, they must find a new partner. Perhaps the most important criterion for selecting participants in the value chain is their attitude towards change. Specifically, it should be re-examined whether the partner applies lean business principles. If this is the case then they want to maximize the value they deliver through constant and continuous improvements, while eliminating waste, and they should definitely be included. If the partner does not apply the lean business principles, and has the qualities to enter the process of lean values, it is possible to establish cooperation with them through training and pointing out the numerous advantages of applying the lean concept.

The next criterion when choosing a partner for long-term cooperation is the quality that is delivered. As quality is one of the vital elements of the "value stream", special attention should be paid to this criterion. If a potential partner applies lean business principles, they should provide the required quality and can be considered a candidate for establishing partnerships.

The capacity of the participants in the value chain, both in terms of machinery and means of transport, and in terms of employees, is another criterion that the candidate should meet. Capacity is especially important for periods of demand fluctuation. Not only existing but also future capacities should be considered. The capacity available to the partner is closely related to product delivery on time. In this sense, if the partner wants to invest more in their capacity, with the aim of delivering the product on time, cooperation can be established with them.

Payment terms and credit standards are the next criteria for selecting a partner. To establish a long-term relationship, it is important that there is trust between the partners. Payment method and conditions will also depend on the level of trust. If the level of trust is higher, it is possible to get more favorable payment terms that will facilitate business. When it comes to payment, the application of advanced technologies among the participants in the supply chain should also be considered. Examining the functioning of the payment system is an important aspect for the company because of the possibility of improving the payment process and the company's accounting itself, which will be discussed later.

The last, but not least important criterion for choosing a partner for a lean supply chain is cost. The relevant supply chain should include all relevant partnership costs and decide on the establishment of cooperation on that basis.

Establishing long-term relationships and forming a lean supply chain will not be possible if partners do not meet all or most of the criteria. If the partners do not meet all the criteria, and there is an obvious desire to improve the business, it is possible to establish relations with them and with joint cooperation to improve the characteristics of the supply chain by performing two groups of activities. The first group of activities refers to the "development" of partners, while the second involves their coordination. "Development" of a partner means providing assistance in improving the strategy, tools and techniques applied by the participant in the supply chain in order to achieve a competitive advantage and at the same time eliminate waste in the resulting partnership.

Coordination means harmonizing the procedures that the company applies with the procedures of other participants in the supply chain in order to standardize them.

2. TARGET COSTING AND LEAN CONCEPT – SIMILARITIES AND DIFFERENCES

Improving the competitive position on a highly competitive and dynamic market implies the acceptance of new business concepts and a change in the organization of production and business processes in the company. The new concept should focus on the following (Vasile & Ion, 2013):

- Organization of the production process through the management of material, money and information flows, which will enable the reduction of costs, time, inventory and the like;
- Connecting phases and establishing a synchronized flow of the process that will indicate possible problems that arise and the possibility of their improvement and
- Integration with external partners in terms of cooperation and collaboration for the purpose of achieving a high level of performance.

The lean concept and the target concept meet the stated requirements for application in companies in the modern business environment. In the following text, we will show the extent to which the requirements of these two concepts coincide, as well as where there are certain disagreements.

Although many believe that target costing originated in Japan, the first evidence of implementation this concept was discovered as early as 1900 in the Ford Motor Company. In this company, managers focused their efforts on finding the best way to manage costs in the production process.

Target costing is a concept that focuses on consumer requirements, in terms of understanding what consumers want and what competitors do in order to meet consumer demand. In that sense, it is necessary to monitor the signals from the market and perform analyses on the basis of which the company will be able to produce the product in accordance with the required characteristics. This external company orientation reduces the probability of entering the market with a product that will not be profitable. In this sense, target costing is directly aimed at the implementation of the lean business principle in the following (Ward, 2003):

- Explicit focus on continuous improvement, cost reduction and elimination of waste in the product design phase;
- Focus on providing value to consumers through targeted sales prices;
- Precisely defined goals related to the company strategy and understandable to all company employees;
- Reducing business risk by defining the target profit;
- Encouraging product and process innovation through the application of value engineering;
- Demand for a high level of cooperation between different organizational parts of the company, as well as company cooperation with suppliers and partners;
- A holistic management approach that can be extended to the entire product life cycle that matches the “value stream”.

The concept of target cost is a proactive future-oriented management approach, which encourages rapid product development and rapid design, which on a highly competitive

market can be one of the prerequisites for achieving a leadership position, which a lean business concept seeks to achieve (Antić & Novićević, 2011). Also, this management concept establishes a direct link between specific consumer requirements and product design and costs, which is basically a lean business concept (Innes, 2004).

However, in addition to numerous advantages, which are achieved by applying the concept of target cost in a lean business environment, certain shortcomings have been noticed. A well-set target costing determines the directions of reaching the target costs and the target profit margin. But sometimes choosing a particular direction can require very strong pressure on employees. For example, striving to shorten product development time may require overtime, which by its nature increases employee tension and leads to their dissatisfaction, low motivation, exhaustion, and poorer results. This situation is unacceptable for companies operating in a lean business environment. This is primarily because employees are the main driving force of the company and employee satisfaction in the workplace is the premise from which to start in achieving a defined company strategy.

The concept of target-cost-based management emphasizes the role of designers, in terms of ensuring certain quality and functionality of products, and the role of managers, who control and coordinate cost management. Also, the role of strategic management accountants as managers and experts is important for achieving the target cost (Malinić, 2008). This concept pays little attention to employees who are directly involved in product creation. On the other hand, lean business concept of strengthening the role of employees is a very important success factor. This is due to the fact that managers in consultation with direct executors set projects for continuous business improvement.

Issues of cost reduction, operating losses, inventory levels, business optimization and product quality make target costing partially eligible for application in the lean supply chain (Antić, Stevanović, & Novićević Čečević, 2019). The concept of target cost takes into account all the above aspects of business, but not to the extent required of companies operating in a lean business environment. Specifically, the concept of target cost is aimed at reducing costs in the phase of product planning and development, while the lean business environment requires a focus on all stages of product development and business processes in the company. Target costing determines the amount of costs that provides a competitive market price of the product and target profit, which does not necessarily mean lowering costs to the lowest level, which is basically a lean business concept. Specifically, costs in the concept of management based on the target cost are reduced only to the amount of the target reduction, and not to the level at which all types of waste are eliminated, as required by the lean business concept. Inventory levels are determined in cooperation with suppliers, where the needs for product components play a significant role, so eliminating all type of waste and achieving zero inventory levels cannot be achieved by the target cost concept. Lean business concept strives to optimize and continuously improve all business processes at all stages of the product life cycle using a number of techniques, which leads to lower inventory levels. In the concept of management based on the target cost, the aspiration for business optimization is not particularly pronounced because continuous improvements are focused on the product design phase. The focus of this concept on the product design phase is important for the lean business concept, because it is in this phase that activities that determine quality, price, cost, functionality and the like are performed (Cooper & Slagmulder, 1997). Product quality as an attribute and controls with pull system are required by lean concept. Externally determined product value and quality is a good side of the target cost concept. But, the aspiration of this concept is to ensure cost reduction and product quality, not to ensure quality at the very source

of product development, which is the task of the lean business concept. Instead of applying a pull system in a lean business environment, the concept of target cost applies the technique of value engineering. The application of this technique gives good results, but it is for the long-term business operations in a lean business environment more adequate to apply the pull system (Antić & Novićević Čečević, 2018).

Based on all of the above, we can say that the concept of target cost can be a good tool to manage operations in a lean business environment. Specifically, the calculation of the target cost is not a completely adequate, nor a complete information basis for making business decisions in conditions of emerging lean production, but it can be of great help for the management of lean companies.

3. Application of Target Costing in Achieving Lean Reduction

Although the match between lean concept and target costing is not complete, their joint application can give good results in order to reduce costs, improve business and achieve set goals. How the target costing can be a good information basis for a lean business concept and lean improvements will be shown on a practical example of a company in the field of construction material production (Al-HAshimi & Al-ardawe, 2020). The managers of this company decided to apply target costing through three levels: determining the amount of target cost, reaching the target cost and continuously improving it for the needs of future cost reduction (Zengin & Ada, 2010).

In this company, four centers of responsibility have been identified for which further research is needed in order to reduce costs (Example adapted from Al-HAshimi & Al-ardawe, 2020). They are: production center, service production center, service marketing center and service administrative center. The production center covers the production process in the company and refers to Raw materials acquisition and handling, Blending, and Pyro processing – Making clinker, and Finished cement grinding. The service production center includes those jobs and activities that do not add value to the product, but without their performance, even the regular activity of the company could not take place. Within it, the following costs have been identified: Electric power, Mechanical workshops and Maintenance. Warehousing and Logistics, Distribution and Transportation, and Marketing and Sales are the costs identified within the service marketing sector. Logistical support for the company's activities is summarized in the service administrative service and refers to costs of Auditing, Quality Control, Human Resources and Research and Development.

In order to determine the amount of the target cost, the company performed an analysis of the prices that competitors have for the same products. The market leader sells products at a price of 76 Eur so the managers of this company decided that their target selling price would be 75 Eur. Based on the determined target sales price, the target profit margin is established. The target profit is determined by applying the target profit margin to the target selling price. Of course, the target profit should be in line with the strategic plans of the company, so as such it must receive support from the top managers of the company (Novićević Čečević, 2016). The target profit margin based on market conditions and company experience is 10% of the target sales price. Target sales price per unit of product obtained by the formula target sales price - target profit margin is 67.5 Eur (75 Eur - 7.5 Eur). In that sense, the managers of this company should find the best way to

reduce the price of the product, but also to increase the annual volume of production and sales in order to use the available capacities.

The second level of implementation is reaching the target cost. In order to achieve the target costs, the current information base on the complete process of performing operations in the company and the amount of their costs must first be analyzed. An overview of operations by responsibility centers in the company is provided in Table 1.

Table 1 Overview of operations and actual costs per operation

Cost Centers	Actual Costs (thousand Eur)	Production / Sales Volume	Cost per Ton (Eur)
Raw materials acquisition	12,000,000	700,000	17.143
Making clinker	10,000,000	700,000	14.286
Finished cement grinding	8,000,000	700,000	11.429
Electric power	7,000,000	700,000	10.714
Mechanical workshops	5,000,000	700,000	7.571
Maintenance	3,500,000	700,000	5.000
Marketing services	4,500,000	700,000	6.429
Administrative services	5,700,000	700,000	8.143
Total cost	56,500,000	700,000	80.714

Source: Author's calculation adapted from Al-HAshemi & Al-ardawe, 2020.

From the presented overview, it is noticeable that the costs per unit of product are 80,714 Eur. By comparing the amount of actual costs per unit with the amount of target cost per unit which is 67.5 Eur it is clear that the costs incurred by this company are 16% higher than the target cost.

As the given amounts of actual costs are presented on an annual basis, further calculations are aimed at determining the annual (total) amount of the target cost and the annual amount of reduction. The annual amount of reduction can be viewed as a lean reduction or a target reduction. In that sense, the total target cost is the product of the target cost per unit and volume of production and amounts to 47,250,000 Eur (67.5 eur * 700,000 j.). The amount of the lean reduction will be the difference between the annual amount of actual costs and the total target cost and amounts to 56,500,000 Eur – 47,250,000 Eur = 9,250,000 Eur The amount of 9,250,000 Eur is the value that should be reduced in the coming period at the enterprise level. This amount of lean reduction should be broken down in more detail into the operations and jobs performed in the company. For these purposes, it is necessary to calculate the amount of the target cost of each operation as well as the amount of the target reduction for a specific operation. The target cost of a specific operation is obtained based on the following formula:

Target Cost of Activity = Total Target Cost x Actual Cost of Activity / Total Actual Costs

By applying this formula, for example, to the operation Raw materials acquisition, the amount of the target cost of the operation of 10,035,398 Eur (47,250,000 Eur * 12,000,000 Eur) / 56,500,000 Eur is obtained. The amount of lean reduction of this operation is 1,964,602 Eur, and it is obtained as follows: 12,000,000 Eur - 10,035,398 Eur. Overview of target costs by operations and lean reductions for each operation are given in Table 2.

Table 2 Overview of target cost and lean reduction for each operation

Supply chain Activities	Actual Costs (thousand Eur)	Target cost	Lean cost	Cost lean per unit
Raw materials acquisition	12,000,000	10,035,398	1,964,602	2.8066
Making clinker	10,000,000	8,362,832	1,637,168	2.3388
Finished cement grinding	8,000,000	6,690,265	1,309,735	1.8710
Electric power	7,500,000	6,272,124	1,227,876	1.7541
Mechanical workshops	5,300,000	4,432,301	867,699	1.2396
Maintenance	3,500,000	2,926,991	573,009	0.8186
Marketing services	4,500,000	3,763,274	736,726	1.0525
Administrative services	5,700,000	4,766,814	933,186	1.3331
Total cost	56,500,000	47,250,000	9,250,000	13.2143

Source: Author's calculation adapted from Al-HAshemi & Al-ardawe, 2020.

Considering that the company is a set of mutually purposefully connected parts, such separation of costs and the amount of reduction by individual operations will be in the function of participation of all parts in achieving the company's goals.

Once the target costs and the amount of lean reduction for each operation have been calculated, it is now necessary to review the costs within each operation and see the potential for reducing them. For the sake of clarity and simplicity of the analysis, as well as due to the need to obtain information that is important for reducing costs, the identified operations performed in the company are divided into two categories of internal and external activities (Al-HAshimi & Al-ardawe, 2020). Internal activities refer to those that the company performs independently and do not depend on suppliers and other participants, such as the production process. External activities are those activities that the company performs in cooperation with its partners and can view them as Upstream Activities and Downstream Activities. Within each group of activities, key operations and costs divided into variable and fixed will be identified.

Internal activities, as we have stated, refer to the key production process in the company which is performed in two operations, Making clinker and Finished cement grinding. In addition to the costs of these two operations, the costs of internal activities include Electric power, Mechanical workshops and Maintenance. As Making clinker and Finished cement grinding are operations that add value and have a significant role in the delivery of the final product, there is further division of costs within these operations into variable and fixed. An overview of variable and fixed costs within these operations is given in Table 3.

This cost overview allows you to see exactly what the costs are within each operation. Based on this overview of costs for key operations, managers come to the conclusion that first of all we need to shorten the idle time of machines, further train workers to increase productivity and shorten waiting times, outsource certain raw materials, improve cooperation with recipients in terms of obtaining more favorable prices for larger quantities of ordered raw materials and the like.

These conclusions were reached on the basis of the fact that the operations Making clinker and Finished cement grinding are oriented primarily on the machining of raw materials, so the high share of fixed wage costs is unjustified. The reason for the high costs is that the company has hired more engineers and technical workers than they need. Earnings costs should be determined based on the value provided by the activities provided.

Table 3 Variable and fixed costs within Making clinker and Finished cement grinding

Cost elements	Making clinker		Finished cement grinding	
	Total Actual Costs (thousand Eur)	Ratio to total cost %	Total Actual Costs (thousand Eur)	Ratio to total cost %
Total variable costs	3,900,000	39.00%	4,970,000	62.13%
Direct wages	800,000	8.00%	1,600,000	20.00%
Indirect wages	600,000	6.00%	1,200,000	15.00%
Commodities supplies	1,400,000	14.00%	1,210,000	15.13%
Service supplies	800,000	8.00%	800,000	10.00%
Other costs	300,000	3.00%	160,000	2.00%
Total fixed costs	6,100,000	61.00%	3,030,000	37.88%
Salaries	2,100,000	21.00%	900,000	11.25%
Commodity Supplies	1,500,000	15.00%	740,000	9.25%
Service supplies	1,200,000	12.00%	660,000	8.25%
Interest and Rents	600,000	6.00%	280,000	3.50%
Depreciation	500,000	5.00%	350,000	4.38%
Other costs	200,000	2.00%	100,000	1.25%
Total	10,000,000	100.00%	8,000,000	100.00%

Source: Author's calculation adapted from Al-HAshemi & Al-ardawe, 2020.

Also, the raw materials needed to perform operations are distributed based on the number of machine hours and not based on the actual capacity of the machine, which leads to higher variable and fixed costs of operation Commodities supplies, whose share in total costs ranges from 10-15%.

The second group of activities that take place in the company are external activities and we will look at them as Upstream Activities and Downstream Activities. Raw materials acquisition is a key operation within Upstream Activities. Within this operation, various necessary raw materials are added, such as limestone, clay, iron, water, etc., which are necessary for further operations. These costs otherwise make up 20% of the total costs. In Table 4. the costs of this operation are divided into variable and fixed, as well as the percentage share of these costs in the total costs of this operation.

Table 4 Overview of variable and fixed costs within Raw materials acquisition

Cost elements	Total Actual Costs (thousand Eur)	Ratio to total cost %
Total variable costs	5,380,000	44.83%
Direct wages	1,200,000	10.00%
Indirect wages	800,000	6.67%
Commodities supplies	1,900,000	15.83%
Service supplies	1,000,000	8.33%
Other costs	480,000	4.00%
Total fixed costs	6,620,000	55.17%
Salaries	1,800,000	15.00%
Commodity Supplies	1,400,000	11.67%
Service supplies	1,200,000	10.00%
Interest and Rents	1,300,000	10.83%
Depreciation	540,000	4.50%
Other costs	380,000	3.17%
Total	12,000,000	100.00%

Source: Author's calculation adapted from Al-HAshemi & Al-ardawe, 2020.

By further analyzing the costs within this operation, company managers identify potential opportunities for improvement. They relate to: eliminating the cost of unused capacity, reducing the cost of raw materials, reducing the cost of services such as maintenance and transportation, increasing productivity and reducing the number of employees. In order to achieve potential improvements, the managers focus their attention primarily on the following costs: Commodities supplies, Service supplies and Salaries.

The costs of Commodities supplies refer to the costs of collecting raw materials necessary to perform operations such as fuel, spare parts, electricity and the like. The share of fixed costs of Commodities supplies is about 12 and is high if we compare it with the variable costs of this category. For the amount of variable costs of Commodities supplies managers of this company have entered into cooperation agreements with suppliers, which is not the case for the amount of these fixed costs. In this sense, managers must negotiate with suppliers and ensure lower raw material prices.

The costs of Service supplies relate primarily to maintenance, equipment rental, transportation, telecommunications, insurance and the like. Their percentage is higher if we take into account that they are mainly related to maintenance. Even when contracting these costs, managers must contact suppliers and enter into contracts that will ensure the provision of quality services for a better price instead of the company performing these tasks independently.

In the end, the amount of salaries within fixed costs and indirect salaries within variable costs exceed the amounts of salaries received by employees who are directly involved in the process. A significant difference in salaries is a cost that does not add value if we take into account that all employees perform the same tasks, either definite or indefinite.

Observing the costs of Downstream Activities, which in this company relate to Marketing services and Administrative services, one can notice their large percentage share. Based on the information on how these processes are performed and what problems arise during their performance, the following measures for potential improvements have been proposed (Al-HAshimi & Al-ardawe, 2020):

- Transportation logistics and reduce costs,
- Careful selection of sales agents and negotiate with them on the method of payment whether cash or deferred to meet the supplier's payment,
- On-time delivery to reduce inventory costs to a minimum,
- Improving the financial system and information flow by using IT system and
- Concern to the efficiency of personnel and opting between permanent employee or outsourcing, especially for quality inspection and product development.

The ability and efficiency of the company manager will be especially expressed when it comes to achieving lean reduction. For these needs, companies can use very efficient target costing techniques such as value engineering, value analysis, kaizen costing and quality function deployment and numerous lean techniques. In any case, care should be taken to ensure that the product achieves primary functionality that will satisfy the desires of consumers at an acceptable cost.

The last level of application of target costing is continuous improvement. This step is especially important when reaching the target cost because TC is a continuous process. Also, the process of business improvement and cost reduction does not end with the product entering the production phase but is continuing through small and continuous improvements to achieve maximum efficiency. Continuous improvements are achieved by applying the Kaizen technique. Kaizen implies small incremental improvements at

every step before making major innovations. When continuously improving, care should be taken (Al-Maryani, 2015):

- That human resources are the most important resource of the company,
- That there are small gradual improvements before radical changes
- That changes are based on continuous business monitoring and properly measured performance.

It is better to improve the company's business immediately by 10%, than to wait for the moment when the business can be 100% improved. Waiting for the moment to come when the business can be fully improved requires a lot of time, and market conditions are relentlessly changing, so the company can be late with reactions to demand and thus lose the race with the competition.

CONCLUSION

The extended application of the lean concept from production to the whole company, and later outside the company, led to the creation of a lean supply chain. In the lean supply chain, business is organized so that the value required by the user of that value is delivered as soon as possible. Users of value, in addition to consumers, are organizational parts within the company, as well as partners upstream and downstream in the chain. The goal of the extended application of the lean concept is to eliminate all forms of waste, increase product quality, deliver the required value on time, quickly respond to requests and the like. In order to be able to measure their financial benefits from the application of the lean concept, managers apply a more modern concept of calculation and costing such as target costing.

Target costing is a cost management concept that aims to manage the costs of all products through the design phase. At the same time, with the help of TC, it is ensured that the product is profitable enough to justify its production. In this sense, it can be used as a profit planning mechanism. Target costing is not limited to the selling price of a product; it is an approach that can be applied to the entire supply chain. TC is much more than a cost accounting system because it respects the wishes and requirements of consumers, focuses on product design, involves the cooperation of employees from different fields and departments not only within the company but throughout the supply chain to minimize costs throughout the product life cycle.

In order to achieve a competitive position in a modern business environment, it is necessary to combine two or more concepts while exploiting their advantages. In this sense, a comparative analysis of the lean concept and target costing has shown the key aspects of importance to consumers common to both concepts and that their combination can lead to business improvement.

Thanks to the application of target costing and certain elements of the lean concept, companies will be able to:

- Define the selling price of products at a level that can give them a competitive advantage;
- Based on the selling price, plan the profit and the rate of return on the engaged funds;
- Get acquainted with the costs incurred in the company in different phases, determine the cost limits for each operation and on the basis of this information the required value of the product within the defined cost limits;

- Identify and manage costs not only at the production stage but at all stages of the process;
- Determine the cause-and-effect relationships between operations and jobs that take place in the company and resource consumption;
- Perform targeted cost reduction and efficiency gains through the application of target costing techniques and the lean concept;
- Develop close and partnership relations both between the employees in the company and with other companies in the supply chain;
- Carefully select partners that will meet the requirements in terms of quality, price and delivery time;
- Improve profitability and long-term business efficiency;
- Reduce business risk and encourage innovation;
- Provide a basis for strategic decision making and continuous performance improvement.

A well-established lean concept and target costing will ensure that teams inside and outside the company work together to meet customer requirements but also to meet each other's requirements while increasing the value created and the performance of the company and partners. To achieve this, it is necessary to carefully consider the entire business process, identify key processes and their costs and resources, as well as select partners who also apply these concepts and take into account the value that is delivered. All these requirements need to be harmonized with the defined sales price or target costs, value orientation and continuous improvement in the lean supply chain.

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PODOBNOST TARGET COSTINGA ZA POTREBE UNAPREĐENJA LEAN LANCA SNABDEVANJA

Konkurentsku prednost možemo da posmatramo kao superiornost nekog od učesnika na tržištu da pravilnom upotrebom resursa i iskorišćavanjem ključnih kompetencija isporuči veću vrednost od konkurenata a da pri tome ne ugrozi kvalitet i funkcionalnost proizvoda. U tom smislu, računovodstvo, a posebno upravljačko računovodstvo, uspešno odgovara na zahteve manadžera za obezbeđivanjem informacija koje će biti adekvatna podrška menadžerima u realizaciji postavljene strategije. Lean koncept i target costing samo su neki od koncepta koji svojom strategijskom orijentacijom mogu biti dobra podrška menadžerima. Cilj rada je da ukaže na sličnosti i razlike lean koncepta i target costinga i da prikaže na praktičnom primeru kako se iskorišćavanjem prednosti navedenih koncepta postižu unapređenja poslovanja u lancu snabdevanja.

Ključne reči: *lean koncept, target costing, redukcija troškova, unapređenja*

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