ACTA ECONOMICA

УДК 33, ISSN 1512-858X, e-ISSN 2232-738X

АСТА ECONOMICA

Научни часопис за економију
Излази двапут годишње

ИЗДАВАЧ:

Економски факултет
Универзитета у Бањој Луци
БиХ, РС, 78000 Бања Лука
Мајке Југовића 4
E-mail: info@ef.unibl.org

ЗА ИЗДАВАЧА:

Проф. др Миленко Крајишник,
декан Економског факултета
Универзитета у Бањој Луци

ГЛАВНИ УРЕДНИК:

Проф. др Горан Поповић

СЕКРЕТАР
УРЕЂИВАЧКОГ ОДБОРА:

Доц. др Тајана Сердар Раковић

ЛЕКТОРИ:

Мр Милица Богдановић
Мр Татјана Марић

ПРЕЛОМ ТЕКСТА:

Милан Дамјановић, дипл. инж. ел.

ИНДЕКСИРАН У СЉЕДЕЋИМ
БАЗАМА ПОДАТАКА:

Publons (Parts of Clarivate Analytics)

DOAJ - Directory of Open Access Journals

ERIH PLUS

Google Scholar

ROAD - Directory of open access scholarly resources

Index Copernicus

WorldCat

CrossRef

ШТАМПА:

Графомарк, Лакташи

ТИРАЖ: 100

ACTA ECONOMICA

Година XIX, број 34

Бања Лука, јун 2021. године

Садржај / Contents

Оригиналани научни чланци – Original Scientific Papers

Прегледни научни чланци – Review Scientific Papers

Претходна саопштења – Preliminary Communication

Оригиналани научни чланци
Original Scientific Papers

EXTERNAL ADJUSTMENT AND FLEXIBILITY OF THE EXCHANGE RATE REGIME: THE CASE OF TRANSITION COUNTRIES

1 Dragan Gligorić, University of Banja Luka, Faculty of Economics, Banja Luka, Bosnia and Herzegovina
2 Borce Trenovski, SS. Cyril and Methodius University in Skopje, Faculty of Economics, Skopje, Macedonia
3 Kristijan Kozheski, SS. Cyril and Methodius University in Skopje, Faculty of Economics, Skopje, Macedonia
*Corresponding author Email: dragan.gligoric@ef.unibl.org;
1 ORCID ID: 0000-0002-7171-8699
2 ORCID ID: 0000-0002-3630-9486
3 ORCID ID: 0000-0002-8182-1219

ARTICLE INFO

Original Scientific Paper
Received: 04.04.2021
Revised: 07.06.2021
Accepted: 08.06.2021

doi 10.7251/ACE2134009G
UDC
330.001:339.727.22(4-664)

Keywords: *exchange rate regime, external adjustment, transition countries, first order autoregression*

JEL Classification: F32, F31, C33

ABSTRACT

Milton Friedman's traditional claim is that flexible exchange rates facilitate external adjustment by means of their corrective movements before the balance of payments crisis occurs. In order to test this hypothesis, we employ the first order autoregression based on the panel data on exchange rate regime and external balance expressed as the share of balance of goods and services in GDP. The sample covers 16 Central and Eastern European (CEE) and 12 Commonwealth of Independent States (CIS) transition countries over the period 2000-2019. The results, which are based on the sample of all transition countries, failed to prove that more flexible exchange rate regimes facilitate external adjustment. When the analysis was performed on two groups of countries separately, the results showed that the deficit of balance of goods and services in CIS countries has a higher persistence compared to CEE countries. However, a more flexible exchange rate regime does not facilitate external adjustment. On the other hand, in CEE countries, the relationship between exchange rate regime flexibility and the rate of balance of goods and services reversion exists, proving that Friedman's hypothesis does hold.

1. INTRODUCTION

The type and application of an exchange rate regime and its impact on the internal-external balance of the economy are one of the most important issues faced by policymakers. According to the official International Monetary Fund (IMF)'s

de facto classification of exchange rate regimes, the country could implement one of ten exchange rate regimes divided into three coarse groups: hard pegs, soft pegs and floating regimes (IMF, 2020). The literature, which focuses on the impact of the exchange rate regimes on macroeconomic performances, is based on two broad types of the exchange rate regimes: fixed and flexible.

There is no consensus in the literature on the macroeconomic effects of the exchange rate regime. Proponents of the fixed regimes argue that stable exchange rates have positive effects on inflation, interest rates, investment, and thus on the economic growth rates. On the other hand, opponents of the fixed exchange rates state that these regimes invoke speculative attacks, so policymakers are forced to increase the real interest rate in order to defend the particular exchange rate. Therefore, a positive effect on economic growth through lower interest rates is not the rule. Authors who favor flexible exchange rate regimes argue that the inability to adjust the nominal exchange rate in the fixed exchange rate regimes when the country faces external shock leads to slower adjustment of the real exchange rate, and thus price distortions, and inefficient resources allocation (Žarković, Gligorić & Tešić, 2012; Levy-Yeyati & Sturzenegger, 2002).

The traditional argument of advocates of flexible exchange rate regimes is that these regimes promote balance of payment adjustment. During the Bretton Woods era, the fixed exchange rates have prevailed in almost all countries with belief that these regimes would be able to provide the stability of international monetary system and promote international trade and economic growth. Although the Bretton Woods system and fixed exchange rate regimes were very popular in the early years of its operation, Milton Friedman, in his article published in 1953, stood firm in favor of flexible regimes. He argues that volatility of exchange rates is misinterpreted by those who are in favor of fixed exchange rates. According to Friedman, the volatility of exchange rates is not a symptom, but a cause of economic imbalances. Fixing the exchange rates would not resolve the economic imbalance problems, but rather suppress them, until they become unsustainable and cause a currency crisis. On the other hand, flexible exchange rates provide exchange rate adjustments on the ongoing basis (Ghosh et al., 2008). Instead of sudden changes of exchange rate in fixed exchange rate regime, when it becomes unsustainable, choosing the flexible exchange rates provides smooth adjustment according to the change in the economic fundaments. Moving to more flexible exchange rates is also often suggested to countries by the IMF as a solution for large current account imbalances (Chinn & Wei, 2008).

The exchange rate regime has a significant impact on the external balance, primarily through the movement of the real exchange rate (RER). The RER is equal

to the nominal exchange rate, adjusted for the inflation difference in the country and abroad. If the domestic inflation is higher than weighted inflation in the major trading partners, the RER appreciates, and competitiveness is deteriorating.

Numerous studies find empirical evidence to support the view that more flexible exchange rate regimes facilitate external adjustment. Chinn and Wei conducted research on the sample that contained about 170 countries over the period 1971-2005, based on exchange rate regime classifications by Levy-Yeyati and Sturzenegger (2004, a,b) and Reinhart and Rogoff (2004). They did not find a strong, robust relationship between exchange rate regime flexibility and the rate of current account reversion, even after accounting for the degree of economic development, the degree of trade, and capital account openness (Chinn & Wei, 2008). According to Chinn and Wei, the absence of a strong relationship between the flexibility of nominal exchange regime and the speed of convergence in real exchange rates is stated as the main reason for the lack of faster external adjustment in the more flexible exchange rate regimes compared to the fixed ones. The analysis that covered period 1970-2008 and the sample of 171 countries used different econometrics methods. The results regarding the impact of exchange rate regime on the current account adjustment process were different, depending on the econometric method that was used. Regardless of the econometric techniques, the overall conclusion supports the positive impact of exchange rate flexibility on the external adjustment (Tippkötter, 2010). Clower and Ito (2012) tried to examine the statistical nature of the persistency of current account balances and its determinants using the panel of 70 countries. They find, generally, that exchange rate regime is not a robust determinant of current account persistence. In addition, using the sample of emerging market countries, they found that fixed exchange rate regime can increase the probability of entering the random walk regime. The random walk regime represents periods during which a country runs an "explosive", or non-mean reverting (nonstationary) current account balance.

A study conducted by a respectable group of researchers led by Artish Ghosh, has confirmed Milton Friedman's claim from the mid-20th century that flexible regimes facilitate external adjustment. Analyzing the sample of 181 countries for the period 1980-2011, the authors have found a statistically significant relationship between the exchange rate regime flexibility and the speed of current account adjustment (Ghosh Qureshi & Tsangarides, 2014). But this study is specific in determining exchange rate regimes that operate within the particular country. The authors detected bilateral exchange rate regime between a country and each country's trade partner. If a country, for example, implements a currency board but the anchor currency fluctuates regarding to the currency of the particular trading partners, the bilateral exchange rate regime is labeled as float-

ing regimes, and an association between bilateral regime and bilateral current account balance is examined.

In the recent study, using a panel of 180 countries over the 1960–2007 period, Eguren-Martín (2016) analyzed external adjustment in industrial and non-industrial countries separately. He founds that in non-industrial countries, more rigid exchange rate regimes were associated with larger and more persistent current account imbalances, while the external adjustment of the industrialized countries did not differ significantly regarding the degree of exchange rate regime flexibility. Faster external adjustment under more flexible regimes exists thanks to expenditure-switching behavior of consumers when faced with changes in international relative prices.

The transition process which began in 1990 was very challenging for socialistic countries in Central and Eastern Europe (CEE), and other socialist countries which were formed following the dissolution of the Soviet Union. The transition process requires an economic liberalization, deregulation, ownership transformation through the privatization process, as well as reforms which are related to the macroeconomic stabilization. The main objective and the main concern of the economic policy at the beginning of the transition process was to achieve macroeconomic stabilization. It implied an inflation reduction and exchange rate stabilization.

The introduction of a fixed exchange rate regime of the domestic currency against a strong currency, was a characteristic of numerous anti-inflation programs in transition countries. The appreciation of the RER is a phenomenon characteristic for the transition countries. The RER appreciation is the consequence of the increase in prices of non-tradable goods (Balassa-Samuelson effect) on the one hand, and the inflows of capital from abroad on the other hand. The fixed exchange rates are associated with higher appreciation, because flexible exchange rates allow mitigating the impact of the capital inflows on RER appreciation (Combes, Kinda & Plane, 2011). The RER appreciation means reduced competitiveness of the domestic production and thus higher external deficits. This could cause the balance of payments crises and force monetary authorities to devalue. Even though the internal balance (economic growth, employment and price stability) is the priority for the policymakers in transition countries, the external balance (sustainable current account) should not be neglected.

The experience of many transition countries has confirmed that the policy of a fixed exchange rate, as a part of an anti-inflation strategy, has contributed to macroeconomic stabilization, which is reflected in the relatively rapid reduction of the inflation to single digits, thus creating conditions for structural reforms

(Beker-Pucar, 2010). The RER appreciation and accumulation of current account deficits have led to external debt accumulation and increased the risk of devaluation. Some of the European transition countries, like Poland, Hungary, Romania, Serbia and the Czech Republic, after archiving the macroeconomic stabilization, introduced more flexible exchange rate regimes. Other countries (Bosnia and Herzegovina (B&H), Bulgaria, North Macedonia and Baltic states (now Eurozone members)), have retained the fixed exchange rate regimes even in the later stages of transition. Therefore, for the countries which have continued the application of fixed exchange rate regimes, monetary policy is aimed at achieving low inflation rather than external balance equilibrium. On the other hand, CIS countries generally did not use the exchange rate as the declared nominal anchor. For some countries, including Kazakhstan and Ukraine, exchange rate has been a de facto anchor. In the case of Belarus, the nominal anchor was Russian ruble, but de facto nominal anchor was US dollar (Keller and Richardson, 2003). According to the IMF extended exchange rate regime classification for the period 1990-2001, composed by Bubula and Ötker-Robe (2002), during the 1990s all CIS countries except for Russia implemented some form of a fixed exchange rate regime, at least in one year. Jeffrey Sachs (1996) also argues that most transition countries, undertook stabilization programs to end high inflation. Sachs advises CIS and CEE countries to adopt a pegged exchange regime as a part of the initial policy of macroeconomic stabilization. After one or two years of stabilization and liberalization, the CIS and CEE countries should move to flexible exchange rate regimes. Even though some countries have achieved stabilization under floating exchange rate regimes, Sachs emphasizes that these costs of stabilization, the costs under the floating exchange rate regime, seem to be much higher than in the pegged-exchange rate stabilization. The literature which analyzed the impact of exchange rate regime flexibility on the external balance in transition countries is not as abundant as for the developed countries. Domaç, Peters, and Yuzefovich (2001) based their analysis on the sample of 24 transition countries for the period 1991-1998. The analysis reveals that countries which implemented fixed exchange rate regime experienced the largest current account imbalances (5.4% of GDP) compared to countries with intermediate and flexible exchange rate regimes, whose current account imbalances were lower, 4.7% and 3.9% of GDP respectively. Sabine Herrmann (2009) used panel data set which included 11 catching-up countries from Central, Eastern and South-eastern Europe between 1994 and 2007. According to Sabine, the flexible exchange rate regime really facilitates current account adjustment, at least in the short run.

Dragutinović (2008) estimated price elasticity of export and import for Serbia and revealed that the sum of these two elasticities is lower than 1, therefore

Marshall-Lerner conditions are not satisfied. This implies that depreciation of exchange rate cannot decrease the current account deficit. Beker-Pucar (2010) investigated whether the policy of greater exchange rate flexibility implemented in Serbia over the period 2000-2009 had an impact on the external balance. The results showed that current account deficits grew regardless of the implemented policy of greater exchange rate regime policy. Vujanić, Žarković and Gligorić (2017) analyzed the impact of exchange rate regime flexibility on the current account imbalance for the European transition countries during the period 2000-2014. The authors concluded that the policy of greater exchange rate regime flexibility facilitated current account adjustment only in more developed transition countries. The results also implied that the fixed exchange rate regimes are more appropriate for less developed transition countries.

In this research, we will investigate the impact of the exchange rate regime flexibility on the external balance in the CEE and the CIS countries over the period 2000-2019. Our assumption is that a more flexible exchange rate regime does facilitate external adjustment in the transition countries. This paper is organized as follows. After the Introduction, we describe the data and methodology which will be used to test our hypothesis. The results contain the descriptive statistic of the main variables which we use in our regression, regression results of the impact of exchange rate regime flexibility on the external adjustment in the transition countries, and the comments. In the discussion, we analyze the obtained results, compare them with similar research, conclude the research, and derive the policy implications regarding the available instruments to deal with external imbalances in the transition countries.

2. MATERIALS AND METHODS

The sample consists of 16 CEE transition countries (Albania, Bosnia and Herzegovina, the Czech Republic, Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Montenegro, North Macedonia, Poland, Romania, Serbia, Slovak Republic, Slovenia) and 12 CIS transition countries (Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Uzbekistan and Ukraine). The analysis is based on the annual data for the period 2000-2019, except for Montenegro for which the analysis covers the period 2007-2019.

In this paper we estimate the rate at which external balance reverts to its mean value, following the methodology used in the similar studies, (Chin & Wei, 2008; Ghosh, Terrones & Zettelmeyer, 2008; Herman, 2009; Ghosh Qureshi &

Tsangarides, 2014), but with certain modifications, due to specificity of transition countries. For this purpose, we use a basic first-order autoregression:

$$BGS_{it} = \rho_0 + \rho_1 BGS_{it-1} + \rho_2 XRR_{it} + \rho_3 (BGS_{it-1} \times XRR_{it}) + \mu_i + \lambda_t + \varepsilon_{it}$$

where,

- BGS_{it} denotes balance of goods and services in country i in year t, expressed a as a percent of GDP. This indicator is taken from World Development Indicators (World Bank, 2020);
- BGS_{it-1} denotes balance of goods and services expressed in country i in the year $t-1$, expressed a as a percent of GDP, i.e. lagged balance of good and services;
- ρ_1 is autoregressive parameter, whose value closer to 1 denotes a more persistent trade balance. The coefficient indicates to what extent the trade balance in current year is caused by trade balance from the previous year;
- XRR_{it} is the degree of the flexibility of exchange rate regime in country i in year t according to the IMF methodology of the exchange rate regime classification (Bubula & Ötker-Robe, 2002; IMF, 2021). The more flexible exchange rate regime, the higher value of XRR_{it} is, so hard peg regime takes value 1, conventional peg and stabilized agreement 2, intermediate regime 3, managed floating/floating regimes 4 and independent/free floating regimes take value 5;
- BGS_{it-1} *x* XRR_{it} *is the interaction term between the exchange rate regime flexibility and lagged trade balance;*
- ρ_3, coefficient next to the interaction term between the exchange rate regime flexibility and lagged trade balance, is the coefficient of key importance for testing whether the exchange rate regime flexibility facilitates external adjustment. If flexible exchange rate regimes imply faster convergence of the trade balance, then the coefficient ρ_3 should be statistically significant and negative (Ghosh Qureshi & Tsangarides, 2014);
- μ_i is country specific effect while *and* λ_t is time specific effect to capture common shock across all countries in the model.
- ε_{it} is standard error and it should be robust.

The expression reversion of the external balance means the adjustment of the balance of goods and services from any default value to a mean value which depends on the underlying equation. It is assumed that this mean value of the balance of goods and services corresponds to its long-run equilibrium, which is country specific. This approach implies that there is a long-run equilibrium, but

it does imply that the long-run value of the balance of goods and services to GDP ratio will be zero (Herman, 2009).

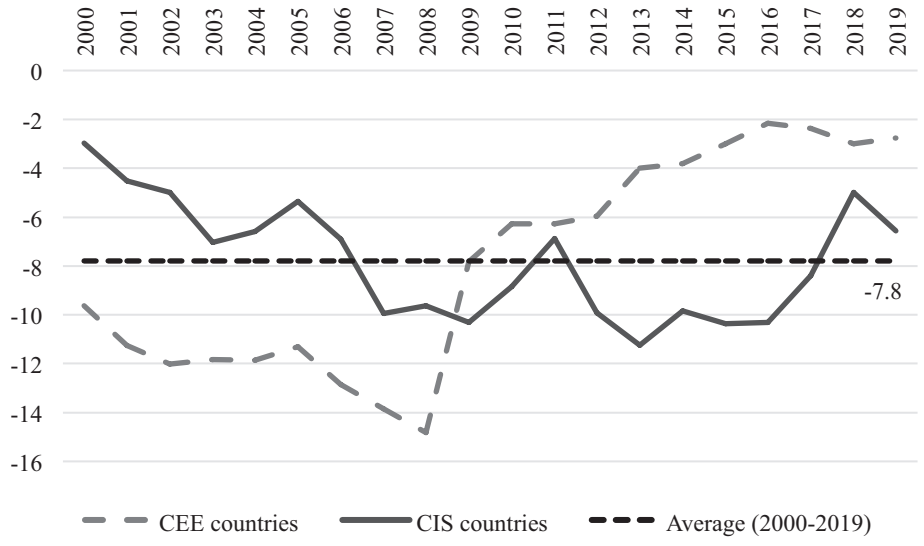
Most previous studies used balance of current account as an indicator for the external balance. In this research, we will use balance of goods and services for this purpose, for two reasons. The first is the specificity of the structure of the current account in the transition countries. Most transition countries are emigrant countries due to economic reasons, and in the previous period transition countries experienced high inflow of workers remittances and pensions. Very high amounts of such inflows are not sustainable in the long run because the second generation of migrant workers often decide to change residence and stay abroad without a plan to return home. Thus, the transition countries cannot rely on this type of inflow for relatively high balance of goods and services deficit in the long run and should improve competitiveness. Second reason for using balance of goods and services as a proxy for external balance lies in the economic theory. The postulated relationship between exchange rate flexibility and external balances refers mainly to trade rather than to personal transfers and factor incomes.

Also, we made some changes in the exchange rate regime classification compared to the IMF classification regarding the classification of the transition countries which have joined Eurozone (Slovenia, Slovakia, Estonia, Latvia, Lithuania). After the 2007, the IMF classifies countries which belongs to the currency unions, according to the classification of the exchange rate regime of the mutual currency. Due to the fact that exchange rate of the euro fluctuates freely on the foreign exchange, all transition countries which have joined the eurozone have been classified as countries which implement a free floating exchange rate regime, according to the IMF classification. However, if we analyze the impact of the balance of payments of these countries on the euro exchange rate, it is quite certain that, due to the relatively low economic capacity, the balance of payments deficit in these countries would not by itself cause an adequate weakening of the euro exchange rate sufficient to restore the equilibrium. Also, if an asymmetric and negative external shock hits some of these countries, the euro exchange rate would not act as a shock absorber. Therefore, the central banks of these countries do not have the possibility of conducting an "independent" monetary policy. Hence, for the purpose of this research, we reclassified these countries as a hard peg regime after joining eurozone. This classification is consistent with the earlier (before 2007) IMF classification rule when countries which are a part of the currency union are classified as "exchange rate regime with no separate legal tender".

Here, we will apply the panel (data) analysis, which is the most appropriate statistical method to analyze two-dimensional, typically cross sectional and longitudinal. The previously specificized model will be estimated with country-specific fixed effect (CFE) and country-specific fixed and time effect (CFE/TE).

3. RESULTS

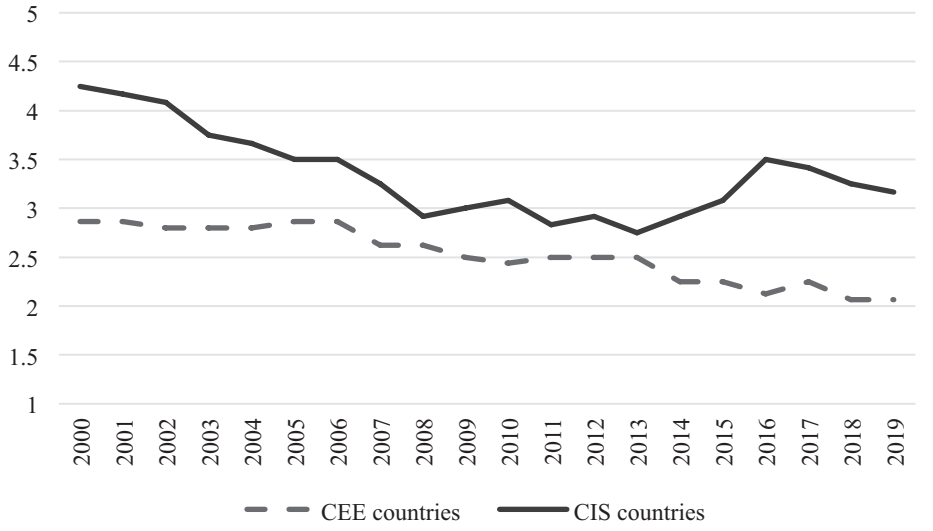
The data presented on the Graph 1 shows that the average value of the balance of goods and services in both CEE and CIS transition countries over the period 2000-2019 was -7,8% of GDP. If we compare the trends for two groups of countries separately, the analysis reveals that the trends were different in the years before and after the Global economic crisis in 2008. In the period before the crisis, the CEE countries experienced, on average, significantly higher deficit of balance of goods and services compared to CIS countries, but in both group of countries, deficits increased, primarily led by the high global economic growth rates. In the years after the global economic crisis, the CEE countries have experienced a decrease in the deficit. The deficit for the CIS countries remained very high, but with decreasing trend after 2016.



Graph 1. Balance of goods and services in transition countries (% of GDP)
Source: Author's calculation based on the World Bank, 2021.

Graph 2 shows the average value of the degree of the exchange rate regime flexibility. As we have described above in the methodology, the exchange rate

regime is represented by the absolute number which takes values from 1 to 5, depending on its flexibility in the particular country/year. More flexible exchange rate regime is represented by a higher number. As we can see, CIS countries applied a more flexible exchange rate regime compared to CEE countries, but the trend of transition toward a less flexible exchange rate regime was obvious only in the years preceding the Global economic crisis in 2008. On the other hand, in CEE countries, the trend toward less flexible exchange rate regimes became visible after 2006, but this trend is mainly the consequence of the accession of some countries to the eurozone. Namely, some countries, such as Slovenia, Slovakia and Latvia applied a more flexible exchange rate before joining the eurozone, but Estonia and Lithuania retained the same degree of the flexibility due to applying currency board during the participation in the European Exchange Rate Mechanism. Also, some CEE countries, such as Serbia and Romania, transited to a more rigid exchange rate regime during the last few years of the analyzed period (IMF, 2021).



Graph 2. Exchange rate regime flexibility in transition countries
Source: Author's calculation based on the IMF, 2021.

A simple comparation of the trends in external balance and applied exchange rate regime could not reliably reveal the relationship between these two trends, due to the impact of other country-specific and time-specific factors which could also determine external balance, and of course the specifics of the panel data. The results of the previously specified model are presented in the Table 1.

The Model 1 refers to the model specification with only country-specific effect, while other model contains both country-specific and time (year) specific effect. Also, the first two models contain estimated results for all countries, while the Model 3 and 4 contain the estimated result for CEE and CIS countries separately.

As we can see from the Table 1, the coefficient on the AR term (BGS_{t-1}), which shows degree of external balance persistence, is statistically significant at 1% of significance in all estimated models. However, the estimated coefficient of interaction term is not significant in the models which include all transition countries, regardless of whether or not the model is estimated with only time effect (Model 1) or both, time and country fixed effect (Model 2). Therefore, our findings are contrary to Friedman's hypothesis if we estimate the model with both group of transition countries – CEE and CIS.

Table 1. Estimation results: Exchange Rate Regime Flexibility and External Adjustment

VARIABLES	All countries		CEE countries	CIS countries
	Model 1	Model 2	Model 3	Model 4
BGS_{t-1}	0.635***	0.629***	0.464***	0.680***
	(0.067)	(0.066)	(0.058)	(0.116)
XRR_t	-0.427	0.109	0.311	-0.915*
	(0.326)	(0.353)	(0.283)	(0.445)
BGS_{t-1} x XRR_t	0.011	0.010	-0.036*	-0.003
	(0.031)	(0.032)	(0.018)	(0.053)
Constant	-1.321	-5.327*	-8.381**	-0.443
	(0.979)	(2.998)	(3.259)	(3.853)
Observations	547	547	312	235
R-squared	0.538	0.567	0.708	0.565
Number of countries	28	28	16	12
Country-fixed effects	No	Yes	Yes	Yes
Time (year) effects	Yes	Yes	Yes	Yes

Source: Author's calculation in STATA 15/SE based on World Bank, 2021; IMF, 2021
Notes: Robust standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)

Because of the problem of a high level of the heterogeneity in the full sample, which arises from the difference between CEE and CIS countries, we have estimated the separate models for CEE countries (Model 3) and for CIS countries (Model 4). In the Model 3, which contains estimated coefficients for CEE countries, the coefficient of interaction term between exchange rate flexibility is statistically significant at 10% and negative, which implies that flexible exchange rate regimes do facilitate balance of goods and services adjustment in CEE countries. This shows that our results are in line with conventional wisdom and Friedman's hypothesis. In the Model 4, which represents CIS countries,

the coefficient of interaction term is not statistically significant, so the choice of exchange rate regime is not important for the external adjustment. From the estimated Models 3 and 4, we can notice that the coefficient on the AR term (BGS_{t-1}) is higher for CIS compared to CEE countries. This coefficient shows to what extent the current year's deficit is conditioned by the deficit in the previous year. If this coefficient is higher, the level of persistence of balance of goods and services deficit is higher too. Therefore, based on our findings, higher external imbalances persistence is observed in CIS countries. These results are in line with the trend in the balance of goods and services, which we have shown in the Graph 1. The deficit of balance of goods and services in CEE countries has a greater tendence to decrease, while in CIS countries, the deficit does show less clear tendency to decrease.

4. DISCUSSIONS AND CONCLUSION

In this research we have used the IMF exchange rate regime classification to analyze the impact of exchange rate regime flexibility on the external adjustment in CEE and CIS transition countries for the period 2000-2019. Unlike other research, which used current account balance, we used balance of goods and services as a measure of external imbalances due to the specifics of transition countries. The common characteristic for most transition countries are the implementation of stabilization of programs based on a fixed exchange rate regime at the beginning of transition. In the latter stages of transition, some countries decided to transit to a more flexible exchange rate regime, while others continued implementing a fixed exchange rate regime. The choice of an exchange rate regime is one of the most important decision for the policymakers due to its impact on both internal and external balance of the economy which is often in conflict. Therefore, some countries opted for continual implementation of a fixed exchange rate regime due to fear that transition to more flexible regimes would cause significant costs such as higher inflation, higher risk and uncertainty associated with exchange rate risk, especially in the case of high external debt and high import dependence. Analysis showed that it is not uncommon for countries to transit to more flexible regimes, and, after a certain period, they will again apply the fixed ones. However, persistent implementation of more rigid exchange rate regime could have a consequence in the higher and more persistent external imbalances, according to the Friedman's hypothesis that flexible exchange rates would facilitate external adjustment.

Our panel analysis, based on a group of 16 CEE transition countries and 12 CIS countries, failed to prove that more flexible exchange rate regimes facilitate ex-

ternal adjustment. When the analysis was performed on two groups of countries separately, the estimation results showed that the deficit of balance of goods and services in CIS countries has a higher persistence compared to CEE countries, but a more flexible exchange rate regime does not facilitate external adjustment. However, in CEE countries, the relationship between exchange rate regime flexibility and the rate of balance of goods and services reversion exists, proving that Friedman's hypothesis does hold. Taking into account that, in general, CEE countries are more developed than CIS countries, the results are in line with the statement that conducting efficient independent monetary policy requires adequate institutional and economic capacity.

Our findings for CEE countries are in line with the results of Herrman (2009) which relate to 11 catching-up countries from Central, Eastern and South-Eastern Europe between 1994 and 2007. The policy of greater exchange flexibility is an efficient tool for reducing external imbalances in CEE transition countries, but it is not solution for the problems of external imbalances in CIS countries. This research has some limitations which are related to relatively short time series data. However, research in this field could be improved in the future by using bilateral data on balance of goods and services and bilateral exchange rate regime according to the methodology proposed by Ghosh Qureshi & Tsangarides (2014). The biggest challenge in conducting such research is the availability of reliable data on the bilateral balance of goods and services.

REFERENCES

Bubula A. & Ötker- Robe, I.(2002). *The evolution of exchange rate regimes since 1990: evidence from de facto policies*. IMF Working Paper, WP/02/155. Retrieved from https://www.imf.org/external/pubs/ft/wp/2002/wp02155.pdf

Chinn, M. D. & Wei, S-J.(2008). A Faith-Based Initiative Meets The Evidence: Does a Flexible Exchange Rate Regime Really Facilitate Current Account Adjustment? *The Review of Economics and Statistics, 95*(1),168–184. doi.org/10.1162/REST_a_00244

Clower, E. & Ito, H. (2012). *The Persistence of Current Account Balances and its Determinants: The Implications for Global Rebalancing*. ADBI Working Papers 400. Asian Development Bank Institute. Retrieved from https://www.adb.org/sites/default/files/publication/156255/adbi-wp400.pdf

Combes, J-L., Kinda, T.& Plane, P. (2011). Capital Flows, Exchange Rate Flexibility, and the Real Exchange Rate. *Journal of macroeconomics*, *34*(4), 1034-1043. doi.org/10.1016/j.jmacro.2012.08.001

Domaç, I., Peters, K.& YuzefovichY.(2001). *Does the Exchange Rate Regime affect Macroeconomic Performance*. Policy Research Working Papers Series 2642. The World Bank. Retrieved from: https://ideas.repec.org/p/wbk/wbrwps/2642.html

Eguren-Martín, F. (2016). Exchange rate regimes and current account adjustment: an empirical investigation. *Journal of International Money and Finance*, *65*, 69-93. doi.org/10.1016/j.jimonfin.2016.03.006

Ghosh, A., Qureshi, M. & Tsangarides, C. (2014). *Friedman Redux: External Adjustment and Exchange Rate Flexibility*. Working Paper, WP/14/146. IMF. Retrieved from: https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Friedman-Redux-External-Adjustment-and-Exchange-Rate-Flexibility-41836

Ghosh, A., Terrones, M.E. & Zettelmeyer, J. (2008). Exchange Rate Regimes and External Adjustment: New Answers to an Old Debate. In C. Wyplosz (ed.), *The New International Monetary System: Essays in Honor of Alexander Swoboda*. London, UK: Routledge. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1969998

Herrmann, S. (2009). *Do we really know that flexible exchange rates facilitate current account adjustment? Some new empirical evidence for CEE countries*. Discussion Paper Series 1, Economic Studies, 22/2009. Deutsche Bundesbank. Retrieved from: https://ideas.repec.org/p/zbw/bubdp1/200922.html

IMF. (2020). *Annual Report on Exchange Arrangements and Exchange Restrictions. Washington.* Retrieved from: https://www.imf.org/en/Publications/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions/Issues/2020/08/10/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions-2019-47102

IMF. (2021). *AREAER ONLINE*. Retrieved form: https://www.elibrary-areaer.imf.org/

Levy-Yeyati E.& Sturzenegger, F. (2002). Classifying Exchange Rate Regimes: Deeds vs. Words. *European Economic Review, 49*(6), 1603-1635. doi.org/10.1016/j.euroecorev.2004.01.001

Levy-Yeyati, E., & Sturzenegger, F. (2003a). *A de facto Classification of Exchange Rate Regimes: A Methodological Note*, unpublished manuscript. Retrieved form https://fsturzenegger.com.ar/pdf/A-de-facto-Classification-of-Exchange-Rate-Regimes1.pdf.

Levy-Yeyati, E., & Sturzenegger, F. (2003b). To Float or to Fix: Evidence on the Impact of Exchange Rate Regimes on Growth. American Economic Review, 93, 1173–1193. DOI: 10.1257/000282803769206250

Reinhart, C.M. & Rogoff, K. (2004). The Modern History of Exchange Rate Arrangements: A Reinterpretation. *Quarterly Journal of Economics, 119* (1), 1-48. DOI 10.3386/w8963

Sachs, J. (1996). Economic Transition and the Exchange-Rate Regime. *American Economic Review, 86*(2), 147-152. Retrieved from: https://www.jstor.org/stable/2118113?origin=JSTOR-pdf&seq=1

Tippkötter, M. (2010). *Global Imbalances and the Current Account Adjustment Process: An Empirical Analysis*. DIW Discussion Paper, 1011. Retrieved from: https://www.diw.de/documents/publikationen/73/diw_01.c.357637.de/dp1011.pdf

World Bank. (2021). *World Development Indicators*. Retrieved form: https://databank.worldbank.org/home.aspx.

Zarković,V., Gligorić, D. & Tešić, J. (2012). Exchange Rate Regimes and Real Exchange Rate in the Western Balkan Countries. *Proceedings of the 2nd International Scientific Conference "Economics Business Management 2012"*, Kragujevac, Serbia.

Beker-Pucar, E. (2010). *Upravljano fluktuiranje deviznog kursa u režimu inflacionog targetiranja u tranzicionim ekonomijama sa osvrtom na Srbiju*. Doctoral dissertation. Subotica; Serbia: University of Novi Sad, Faculty of Economic Subotica.

Vujanić, V., Žarković, V. & Gligorić, D. (2017). The Impact of Applied Exchange Rate Regimes on the External Balance of European Transition countries. *Svarog, 15,* 150-167. doi.org/10.7251/SVR1715150V

Dragutinovic, D. (2008). *Moć i nemoć monetarne politike u uspostavljanju ravnoteže između platnobilansnih ciljeva i ciljeva inflacije*. Radne Studije. Beograd, Srbija: Narodna Banka Srbije. Retrieved from: https://nbs.rs/export/sites/NBS_site/documents/publikacije/strucni-radovi/2008_12_DD.pdf

Keller, P.M. & Richardson, M. (2003). *Nominal Anchors in the CIS*. IMF working paper, WP/07/179. Retrieved from: https://www.imf.org/en/Publications/WP/Issues/2016/12/30/Nominal-Anchors-in-the-CIS-16784

СПОЉНО ПРИЛАГОЂАВАЊЕ И ФЛЕКСИБИЛНОСТ РЕЖИМА ДЕВИЗНОГ КУРСА: СЛУЧАЈ ТРАНЗИЦИОНИХ ЗЕМАЉА

1 Драган Глигорић, Универзитет у Бањој Луци, Економски фалултет, Бања Лука, Босна и Херцеговина

2 Борче Треновцки, Св. Кирил и Методије Универзитет у Скопљу, Економски факултет, Скопље, Македонија

3 Кристијан Кожески, Св. Кирил и Методије Универзитет у Скопљу, Економски факултет, Скопље, Македонија

САЖЕТАК

Традиционална тврдња Милтона Фридмана је да флексибилни девизни курс олакшава спољно прилагођавање својим корективним кретањима, прије него што дође до платнобиланске кризе. Да бисмо тестирали ову хипотезу, користимо ауторегресију првог реда засновану на панел подацима који се односе на примијењене режиме девизног курса и спољнотрговинском билансу израженим као удио биланса роба и услуга у БДП-у. Узорак обухвата 16 транзиционих земаља Централне и Источне Европе (ЦИЕ) и 12 земаља Заједнице независних држава (ЗНД) током периода 2000-2019. Резултати базирани на узорку свих земаља у транзицији нису успели да

докажу да флексибилнији режими девизног курса олакшавају спољно прилагођавање. Када је анализа извршена на двије групе земаља одвојено, резултати показују да дефицит биланса роба и услуга у земљама ЗНД има већу истрајност у поређењу са земљама ЦИЕ, али флексибилнији режими девизног курса о овим земљама не олакшавају спољно прилагођавање. Међутим, у земљама ЦИЕ постоји веза између флексибилности режима девизног курса и спољнотрговинског биланса, тако да Фридманова хипотеза ипак вриједи.

Кључне ријечи: *режим девизног курса, спољно прилагођавање, земље у транзицији, ауторегресија првог реда*

ESTIMATING THE GROSS DOMESTIC PRODUCT OF NIGERIA DURING MILITARY AND CIVILIAN REGIMES: A CHOW TEST

1 Abidemi Abiola, Department of Economics, Ajayi Crowther University Oyo, Oyo State, Nigeria
2 Rasak Adetunji Adefabi, Department of Economics, Emmanuel Alayande College of Education Oyo, Oyo State, Nigeria
*Corresponding author E-mail: abiolademis@yahoo.com, a.abiola@acu.edu.ng
1 ORCID ID: 0000-0002-0246-7718
2 ORCID ID: 0000-0003-2498-8132

ARTICLE INFO

Original Scientific Paper
Received: 01.09.2020.
Revised: 22.02.2021.
Accepted: 23.02.2021.

doi 10.7251/ACE2134025A
UDC
355.48(669):[332.155:620.92

Keywords: *gross domestic product, military regime, civilian regime and Chow test*

JEL Classification: E01, H11, H53

ABSTRACT

Gross domestic product is the commonest economic variable that is used to measure economic performance, either for intertemporal or international comparison. Nigeria as a country has been ruled since independence by two sets of regimes: the military and the civilian. Arguments were and still are concerned with which of the two regimes favoured the country economically. The study therefore estimates the gross domestic product of Nigeria using Chow test. The essence of Chow test is to determine if there was structural break from the point the country fully began civilian dispensation from the previous military regime. Using both the F statistic and the Chow test, the results show that there was indeed structural break between the military regime and the civilian regime. This result was further confirmed by the Cusum Square test that shows that the overall model was unstable before the correction. The results further show that out of five components of aggregate demand, four of the variables have coefficients higher during the civilian than the military regime. The study therefore concluded that civilian rule is better economically than military rule in Nigeria. It was recommended that politicians and political office holders should act within the ambit of the law to sustain the democracy the country is currently enjoying.

1. INTRODUCTION

The national income, according to conventional economics definition, is the total monetary values of all the goods and services produced by the nationals and non-nationals residing in a particular country irrespective of the geographical location of producers. The estimates are usually done at periods of time, usually

once a year. It is captured by what is called gross domestic product. A lot of economic variables are used in determining the health situation of a particular country. Testing the economic situation of a country is often done in two layers; the intertemporal comparison and the international comparison (Iyoha, Oyefusi and Oriakhi, 1998). The intertemporal comparison situates the country's economic performance from year to year. That is, it is used when a particular period in the history of a country is needed to be compared with another period. On the other hand, international comparison is done when trying to compare the economic performances of two or more countries.

Since 1960 when the nation got its independence, Nigeria as a country has been ruled largely by two different regimes, the military and the democratic. The catalogue of the different regimes is epitomized by the arrival of Abubakar Tafawa Balewa on October 1, 1960 as the country's first Prime Minister. This was the period when the country practiced the parliamentary system of government, and the country's ceremonial Head of State was the Queen of England (Babatola, 2014). The country became a republic in 1963, with Tafawa Balewa still at the head of affairs. This democratic dispensation was terminated by the military coup on the 16th of January, 1966. This was the coup that brought in Major General Johnson Aguiyi-Ironsi. He was the Nigeria's Head of State for a period of six and a half months before he was assassinated and another military head of state, General Yakubu Gowon, took charge. Aguiyi Ironsi's period as the country's head of state was perhaps the longest of all the military regimes as he ruled the country between August 1, 1966 and 29th of July, 1975 (a period of approximately 9 years) before he was assassinated (Odinkalu, 2001; Ehwarieme, 2011)

The 1975 coup brought in the regime of General Muritala Muhammed on 29th of July, and he was in charge of the country's affairs for about 7 months before he was assassinated on 13th of February, 1976 by a coup led by Dimka. The death of Muritala Muhammed heralded another military regime headed by Major General Olusegun Obasanjo, who reigned until October 1, 1979 when he voluntarily handed over power to a democratically elected government of Alhaji Shehu Shagari. That period started the country's second republic and the country switched from the British parliamentary system of government to American presidential system. The four year period was successful completed on the 30th of September, 1983 and he was re-elected for the second and final term, expectedly to terminate on September 30, 1987. The second term was however cut short by another coup on the 31st of December, 1983. This was the coup that brought in Major General Muhammadu Buhari. Buhari was directing the country's socio-economic affairs of the country until his regime was equally terminated by a palace coup (Akanji, 2019) on the 27th of August, 1985. This coup brought in

General Ibrahim Badamosi Babangida who was the second longest serving head of state of Nigeria. He reigned for a period of 8 years before he "stepped aside" forcefully on 26th of August, 1993. His exit brought in an interim government headed by Chief Ernest Shonekan, the only non-military and non-democratic regime but was classified as the third republic (Kifordu, 2013). The interim government was brought down by General Sanni Abacha on the 17th of November, 1993 who took charge of the nation's affairs until death terminated his regime also on 8th of June, 1998. The demise of General Abacha ushered in the regime of General Abdusalami Abubakar on the 8th of June, 1998 (Ogbeidi, 2012). Abdusalami midwifed the transition to civil rule and within a period of one year, he handed over power to another democratically elected government headed by Chief Olusegun Obasanjo. The second coming of Obasanjo heralded the fourth republic which the country is still enjoying (State House, Federal Republic of Nigeria, 2019).

The point of the above exposition is that, given a period of 60 years of independence, the chronicle of regimes in the country shows that the country has been ruled approximately 30 years apiece both by the military and the civilian regime. While, there is no consensus on which regimes fare better in improving the lots of the citizenry in Nigeria, the popular opinion is that the worst of democratic regime is by far better than the best of military regimes. Typical macroeconomic objectives are synonymous with national objectives. (Abiola, 2019). These macroeconomic objectives are broadly divided along the lines of general and the specific. Irrespective of the economic status of a country or the type of dispensation at the helm of affairs of the country, a country would always pursue four general economic goals of increasing the growth of the nation's income or output, maintenance of price stability, reduction in unemployment rate and maintenance of balance of payment equilibrium.

The most prominent of these goals is the increase in national income or national output. While continuous increase in the nation's gross domestic product is only a sign of economic growth that does not translate into better welfare for the citizenry, it is at least a pedestal which the economic performance of a country is gauged with over time. The aim of this study is therefore to assess the economic performance of the two regimes, military and civilian, in Nigeria with a view of ascertaining which of the regimes impacted positively on the populace. While acknowledging the multi-diversity and the very sensitive debates and arguments that this topic is capable of throwing up, it is the desire of this study to narrow the scope of the discussion to only gross domestic products alone. This does not undermine other variables which historians, political scientists, diplomats and

other related discipline workers may want to bring into the equation of which regime fares better.

1.1. Objectives of the study

The broad objective of the study was to estimate the gross domestic product of Nigeria for the period of 1984-2018. The specific objectives are: to determine the economic performance of the country between 1984 and 1999, a period of military dispensation; to investigate economic performance of the country from 1999 to 2018, a period of democratic dispensation; situate the two periods with drawing a valid conclusion on which of the two regimes is better.

1.2. Review of literature

There exists quite a large number of economic literature that tackles estimating economic growth. Some studies examine economic growth from the angle of estimating the determinants of gross domestic product, others examine it from the angle of estimating the multipliers of the components of aggregate demand. Hashim et al (2018), opines that gross domestic product (GDP) growth is extremely vital in order to pursue continuous development and advancement needed for any nation. The paper examines the relationships between five macro variables, particularly, population, gross fixed capital formation, labour force participation, government expenditure on health and education, and real GDP in Malaysia. The findings reveal that population and gross fixed capital formation are positively related to GDP. Therefore, they are important factors in explaining higher GDP. Meanwhile, other factors do not essentially contribute to GDP growth and are negatively related to each other, respectively.

Chizonde (2016) investigates the determinants of economic growth in Zambia using the Bounds Approach to Integration developed by Persaran and Shin (1999). The study specifically pays attention to the role of copper, a major export item in the country, in the analysis of economic growth. In order to test the validity of this postulation, the study estimates an Autoregressive Distributed Lags (ARDL) Model with copper prices as one of the variables of interest. Estimation results indicate that, in the long-run, economic growth is determined by physical capital, exchange rate, inflation, crude oil price, government spending and agricultural productivity; international copper prices only influence growth in the short-run. Therefore, with proper planning and strategic policy interventions, the study concluded that Zambia can still achieve higher sustainable economic growth even when international copper prices are falling.

In another study related to economic growth, Maingi (1999) examines determinants of the real gross domestic product growth rate in Kenya. The objectives of the study were to identify the factors that determine fluctuations in real gross domestic product (GDP) growth rate in Kenya, measure the relative effect of the factors, and give policy recommendations. Time-series data were collected from government and the World Bank publications for the period 1973-1997. Data collected were integrated to make it stationary. Ordinary least squares (OLS) method of estimation using time-series programme (TSP) was applied to stationary data. Both linear and log-linear models were run and on the basis of results the linear model was adopted. From the linear regression results, growth of capital stock, export growth, financial development, external debt, exchange rate, and real interest rate were found to be significant determinants of real gross domestic product. On the basis of these findings, policy recommendations were then drawn on these variables so as to accelerate the pace of GDP growth rate in Kenya.

Ali and Salif (2017) evaluate the determinants of economic growth for Pakistan. The research tries to analyse the nature of causality between economic growth, foreign direct investment, agriculture rate, energy consumption and trade openness. The ADF unit root test is used to determine the order of integration of variables. While Johansen (1988) and Johansen and Juselius (1990) maximum likelihood estimation approach is applied to check the co-integration and VECM is used to check the short run correlations. Diagnostic test, impulse response function, variance decomposition and granger causality are also used to check autocorrelation and causality among these variables. The result shows that there is affirmative impact of agriculture, energy consumption, trade liberalization and foreign direct investment on gross domestic product. Moreover, in short run trade openness, agriculture rate and energy consumption have positive impact on economic growth, but foreign direct investment has negative impact on gross domestic product. Though, the block of exogeneity tests shows that the granger causality runs from gross domestic product, trade openness, foreign direct investment, energy consumption and agriculture growth rate, while only agriculture growth rate and energy consumption are significant.

Volatility and the sluggish nature of Nigeria's economic growth response to various macroeconomic efforts at enhancing the economy prompted Uwakaeme (2015). The study examines the major economic growth determinants as well as the direction of causality that exists between economic growth and some selected economic growth indicators in Nigeria, employing the Johansen Co-integration and Granger Causality tests for a period 1980-2012. Leaning on the newer endogenous growth framework and based on the empirical evidences, the

results demonstrate that a positive and significant long-run relationship exists between economic growth (GDP) and some selected economic growth indicators namely: productivity index (industrial), stock market capitalization and FDI indicating that they are major growth determinants. However, the impact of trade openness, although positive, is not quite impressive as reflected in the size of its regression coefficient in part. Others (inflation and excessive government fiscal deficit) show significant inverse relationship with economic growth, implying that they constitute impediment to the growth of the economy. The directions of causality between economic growth and the selected determinants are mixed – unidirectional, bilateral and independent. Overall, the speed of the equilibrium adjustment (as indicated by well-defined negative ECM coefficient) is slow and suggests that economic growth process in Nigeria tends to adjust slowly to the disequilibrium changes in those determinants suggesting policy lag effect. Based on these findings, the study recommends that the government should strive to achieve sustainable price stability, fiscal discipline, and economic efficiency driven by infrastructural support and enhanced technological capabilities, strong institutional and economic reforms to increase production capacity.

Ismaila and Imoughele (2015) examine the macroeconomics determinants of economic growth in Nigeria measured by real gross domestic product (RGDP). The study used time series data obtained from CBN for a period of 26 years (1986-2012). Augmented Dickey-Fuller (ADF) test was used for the unit root test and Johansen's co-integration test was also conducted to establish long run relationship between economic growth and its macroeconomics determinants. The result shows six co-integrating equations which establish the existence of long-run relationship among the variables. Ordinary Least Square statistical technique was used to assess the degree of influence the variables have on each other. The results show that gross fixed capital formation, foreign direct investment and total government expenditure are the main determinants of Nigeria economic output under a stable inflationary rate. The study recommended that there is the need for government to consciously develop the business environment by provision of necessary infrastructure, which will lower the cost of doing business in Nigeria. There is also the need for the government to retain tight monetary and fiscal policies in order to fight inflation in the Nigerian economy, since inflation has negative influence on investment and Nigeria economic growth and finally, there is the need to put stringent policy in place to minimise strike action in the Nigerian labour sector in order to enhance their performance to the nation economy.

Egbulonu and Ajudua (2017) also examined the determinants of economic growth in Nigeria using the macro-econometric approach for the period 1980-

2014. Data for the study were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin and the National Bureau of Statistics (NBS). The macroeconomic model formulated used Gross Domestic Product (GDP) as the dependent variable while Foreign Direct Investment (FDI), Degree of Openness (DOO), Gross Capital Formation (GCF), Money Supply (MS), Interest Rate (INT), Government Expenditure on Education (GEE) and Employed Labour Force (ELF) are the explanatory variables. The data were tested for Stationarity using Augmented Dickey-Fuller (ADF) Unit Root test. The test revealed that all the variables used in the study are stationary at their first difference [i.e. 1(1)]. The data were also subjected to co-integration test in order to see whether using the variables together in the model would produce reliable results. The test revealed that a long run relationship exists between economic growth (GDP) and the macroeconomic variables used in the study. The study found that foreign direct investment, degree of openness, gross capital formation, money supply, government expenditure and labour force have positive and direct relationship with economic growth (GDP) while interest rate has a negative relationship with GDP. However, gross capital formation is the only variable that is not significant at 5% level. This led to the conclusion that all the variables specified in the model (except gross capital formation) are important determinants of economic growth in Nigeria. The study recommended that there should be an improvement in investment in major sectors of the economy, especially the agricultural and industrial sectors. Also, the government should adopt an aggressive national investment programme to channel all unexpected and unbudgeted incomes arising from oil windfalls, recovered loots and tie every such unforeseen gains to specific investment projects. In addition, foreign direct investors should be given operational terms favourable to the nation's economy, and foreign investors should be made target idle or new sectors in the economy. Finally, investment in human capital and engaging the huge unemployed labour force in the country should be of high importance to the government.

Panshak, Civcir and Ozdeser (2020) examine Nigeria's long run growth path using the externally and internally constrained version of Thirlwall's growth model from 1982 to 2015. The study modifies the SCA-BOPCG to take into account the effects the foreign contents in export growth and the domestic investment. Three Stage Least Squares method is used to obtain the required elasticities for the estimation of the domestic income growth. The study affirms the robustness and validity of the modified model in determining the growth path for Nigeria. The outcome of the empirical study reveals that Nigeria's economic growth process is balance-of-payment constrained. Even though monetary policies improve growth performance, Nigeria sustainably grows faster with policies aiming at improving external balance or reducing the import components of demands, in-

creasing export share to products with high elasticity of demand as well as keeping budget deficits within the universally acceptable limits.

The opinion of Adebayo (2016) is that economic growth in Nigeria has been under serious dimensional attacks especially since the commencement of the Buhari administration in 2015. The GDP as the proxy for economic growth has been surrendered to recession since the second quarter of 2016. Economic recession is synonymous with, what most commentators and analysts use as a practical definition of recession, two consecutive quarters of decline in a country's real (inflation adjusted) gross domestic product (GDP) - the value of all goods and services the country produces. It is considered as a period of falling demand, production, and economic activities which causes panic and great concern in financial markets generally. The quest for knowing what is next was the objective of this paper. The GDP in US Dollars was subjected to static forecasting models using 1960-2015 as the sample frame with a decade forecast of 2016-2025. Findings revealed that GDP, which was at a peak of US$568.51 billion in 2014 toed a downward trend of US$481.07 billion in 2015, picked from the downward trend increasing marginally to a forecast value of US$483.53 billion in 2016 and US$508.78 billion in 2017 to US$533.33 billion in 2018 and GDP of US$564.78 billion in 2019; but could not reach the 2014 peak (maxima), the peak to-trough (2014) output of US$568.51 billion, until the 1st quarter of 2020. The study recommended among others that the Federal Government should be economically diplomatic in handling the menace of militancy in the Niger Delta if it is difficult to balance the economy without oil. This will go a long way in revamping the economy provided that the level of destruction is still within economic repairable possibilities.

The study by Uchechukwu and Ibiok (2015) analysed sectoral contributions to Gross Domestic Product by agriculture, industry and service sectors of the economy using a Vector Autoregressive (VAR) approach. The test of stationarity using Augmented Dickey Fuller (ADF) showed that all the variables were integrated of order one. Granger causality was used to find the linkages among the variables under consideration. The result showed bilateral causality between GDP and sectoral contribution to GDP by Industry. Thereafter the unrestricted VAR parameter estimate was obtained for GDP and sectoral contribution to GDP by industry. In conclusion, it is recommended that the Nigerian government should come up with strategic master plan to diversify the economy using the agriculture and service sectors since the Nigerian economy from our analysis is grossly dependent on sectoral contributions of industry to GDP.

Babalola, Salako, Yusuf and Egbekunle (2015) empirically compared the impact of government expenditures of adjudged critical sectors on economic growth be-

tween the military and civilian period in Nigeria. It employs quantitative analysis by the use of Auto Regressive Distributed Lag model to estimate both short-run and long run impact of Government expenditures on economic growth between these periods. The study reveals that during the military era government expenditures on education, agriculture and defence have positive and significant impacts on the economic growth in the long-run. Government expenditures on defence and agriculture were retarding the growth in the short run. However, during the democratic system, government expenditures on agriculture and transport/communication sectors promote growth in Nigeria both in the long run and short run. The government expenditures on education and defence have significant negative impacts on the economy in the long run. The study concludes that the reason for the failure of public expenditures to achieve the fiscal objectives is not connected to the fact that the level of corruption is outrageous to the extent that if it is not at par with corruption during the military regime it surpasses it. Consequently, the study decries a policy prescription that the government expenditures of these sectors should be increased except for the education sector to meet the UNDP recommendations. The government should avoid the proliferation of anti-graft agencies but strengthen the available ones to carry out their functions diligently without political interference.

Closely related to this is the study by Anyiwe and Oziegbe (2016) that carried out a statistical investigation on the Nigerian system (which has experienced both democratic and military regimes) to determine which regime has brought a greater level of economic growth, Statistical time-trend analyses are applied to some Nigerian economic variables. Eleven economic growth variables such as gross domestic per capita, food production per capita and discomfort index were used. The results show that seven of the eleven variables indicate better performance during democracy compared to military rule, while both regimes performed abysmally in the remaining four variables. It is therefore recommended that for greater economic growth, Nigeria should continue to embrace democracy and that well-articulated macroeconomic policies to encourage economic variables such as non-oil export trade, foreign direct private investment, food production, etc. should be made in democratic and good governance settings.

The study conducted by Anazor (2011) is about leadership and governance in Nigeria. This study compared and contrasted as well as examined critically the military rule and civilian rule in Nigeria government and politics and also suggested some solutions for effective leadership and good governance in Nigeria. The researcher raised six questions backed up by three formulated hypotheses. The questionnaire approach to statistical analysis was adopted. The primary instrument of data collection was the interview method. Exactly 175 people were

duly interviewed from the six geo-political zones of Nigeria including FCT Abuja. The three hypotheses formulated serve as a guide to the work. They were accepted or rejected based on the analysis of the data generated, using descriptive or content analysis. Majority views and minority views were recorded and most times more than a single person shared the same opinion in various issues. The findings of the study include: bad leadership and ineffective governance impede development; the negative influence of colonialism, imperialism, and neocolonialism militates against development in Nigeria; the military rule militates against development in Nigeria. Some recommendations made include: decolonization, transparency and accountability, radical but non-violent revolution, and the pursuit of true freedom by dismantling of Whiteman's throne theory.

Etim and Ukpere (2012) examine the impact of military rule on democracy in Nigeria. The paper seeks to explain the rationale of the militarized dispositions of politicians in the current democracy. It adopts descriptive and case history perspective, asserting that the behavioural trend is an outcome of the long years of military governance. The paper found out that military rulership affects the executive, legislature, the judiciary and the civil society. The values and norms imbibe manifests in the practice of the current democracy. This explicates the use of force rather than dialogue in the suppression of dissent in 'Odi', and 'Zakibiam', disobedience of the court orders, closure of media houses, the arrest of journalists and militancy as in the Niger-Delta.

2. METHODOLOGY AND MODEL SPECIFICATION

As stated in the title of this study, the methodology adopted is econometrics with special emphasis on unit roots tests, co-integration test and Chow test. The Chow test is a statistical and econometric test of whether the coefficients in two linear regressions on different data sets are equal. The Chow test was invented by economist Gregory Chow (1960). In econometrics, the Chow test is most commonly used in time series analysis to test for the presence of a structural break. In macroeconomics, a structural break occurs when there is an unexpected shift in the data of a time series (Luitel and Mahar, 2015). For the purpose of this analysis, we broke the trend of Nigeria's gross domestic product to two periods, 1983-1999 (the military period) and 1999-2018 (the civilian period).

Chow Test examines whether parameters of one group of data are equal to those of other group. Simply put, the test checks whether data can be pooled. If only intercepts are different across groups, this is a fixed effect model, which is simple to handle. Let us consider two groups.

$y = \alpha + \beta x + \varepsilon$ for all observation

$y = \alpha_1 + \beta_1 x + \varepsilon_1$ for n_1 observations (group 1)

$y = \alpha_2 + \beta_2 x + \varepsilon_2$ for n_2 observations (group 2)

The null hypothesis is $\alpha_1=\alpha_2$ and $\beta_1=\beta_2$. If the null hypothesis is rejected, two groups have different slopes and intercepts; data cannot be pooled.

$$F(J, n_1 + n_2 - 2K) = \frac{\left(e'e - e_1'e_1 - e_2'e_2\right)/J}{\left(e_1'e_1 + e_2'e_2\right)/n_1 + n_2 - 2K} = \frac{\left(SSE - SSE_1 - SSE_2\right)/J}{\left(SSE_1 + SSE_2\right)/n_1 + n_2 - 2K}$$

where $e'e$ is the SSE of the pooled model and J is the number of restrictions (often equal to K—all parameters

The model adopted for this study is the Keynesian model of open macroeconomy where

$$Y = f(C, I, G, X, M) \quad (1)$$

Linearly expressed as

$$Y = \alpha + \beta_1 C + \beta_2 I + \beta_3 G + \beta_4 X + \beta_5 M + \varepsilon \text{ for all observations} \quad (2)$$

$$Y = \alpha_1 + \beta_1^1 C + \beta_2^1 I + \beta_3^1 G + \beta_4^1 X + \beta_5^1 M + \varepsilon_1 \text{ for } n_1 \text{ observations (group 1)} \quad (3)$$

$$Y = \alpha_2 + \beta_1^2 C + \beta_2^2 I + \beta_3^2 G + \beta_4^2 X + \beta_5^2 M + \varepsilon_2 \text{ for } n_2 \text{ observations (group 2)} \quad (4)$$

Where

Y = Gross Domestic Product

C = Household Consumption Expenditure

I = Private Investment Expenditure

G = Government Expenditure

X = Export

M = Import

For the purpose of this study, three log linear regression equations were estimated. The first for the overall data set spanning from 1984 to 2018. The second spanning the period of 1984-1998, while the last one spanning the period of 1999-2018.

3. EMPIRICAL ANALYSIS AND RESULTS

3.1. Trend Analysis of Nigeria GDP

A very vantage position to begin with our analysis is the examination of the trend of the country's gross domestic product between 1984 and 2018. This is presented in Figure 1 below:

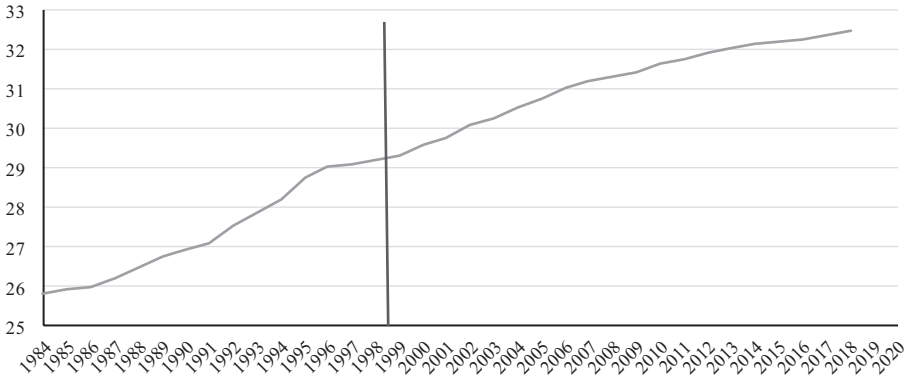


Figure 1: Trend of Nigeria GDP
Source: Computed by the author

A casual observation of the figure above shows that there does not seem to be a break in the trend throughout the period of observation, especially the period under consideration. Therefore, it is imperative we use Chow test to confirm if indeed there was no structural break in the GDP of Nigeria. The results which are presented in Appendices 1, 2 and 3 are summarized in the Table 1 below:

Table 1: OLS estimates of the overall data (1984-2018)

Variables	Constant	C	I	G	X	M
Coefficient	0.932	0.563	0.341	0.063	0.186	-0.151
t statistics	1.913	13.079	5.997	3.852	5.520	-3.504
$n=n_1+n_2$			35			
R^2			1.00			
Adjusted R2			0.999847			
SSE			0.04			
Durbin Watson			1.26			
$Df=n_1+n_2-2k=23$			23			

Source: Author's calculation (2021)

Table 2: OLS estimates of the military regime data (1984-1998)

Variables	Constant	C	I	G	X	M
Coefficient	-0.001	0.519	0.429	-0.010	0.219	-0.148
t statistics	-0.229	12.170	5.590	-0.364	11.672	-9.393
n_1			15			
R^2			1.00			
Adjusted R^2			0.999783			
SSE			0.004			
Durbin Watson			2.58			
Df=n_1-2k			3			

Source: Author's calculation (2021)

Table 3: OLS estimates of the civilian regime data (1999-2018)

Variables	Constant	C	I	G	X	M
Coefficient	-0.023	0.524	0.433	0.012	0.201	-0.129
t statistics	-0.789	117.019	21.669	9.659	35.716	-19.649
n_2			20			
R^2			1.00			
Adjusted R^2			0.999948			
SSE			0.006			
Durbin Watson			1.47			
Df=n_2-2k			8			

Source: Author's calculation (2021)

From the F specified above, the estimated F is as given below:

$$F(6,23) = \frac{\left(e'e - e_1'e_1 - e_2'e_2\right)/J}{\left(e_1'e_1 + e_2'e_2\right)/n_1 + n_2 - 2K} = \frac{\left(0.04 - 0.004 - 0.006\right)/6}{\left(0.004 + 0.006\right)/23} \approx 12.5$$

The decision rule is such that if F calculated as observed with the 12.5 is greater than F from the table ($F_{(k,n-k,5\%)} = F_{(6,23,5\%)}$) = 2.53, then the null hypothesis of the same slope and the same intercept is rejected and data cannot be pooled. The implication of the result is that the hypothesis for stability of parameters is rejected and that there exists structural break between the military era and the civilian era as regards the Nigeria GDP.

3.2. Chow breakpoint test

Giving credence to the above F-statistic analysis is the Chow breakpoint test as estimated using E-views. The result is presented in the Table 4:

Table 4: The Chow Breakpoint test result

Chow Breakpoint Test: 1999			
Null Hypothesis: No breaks at specified breakpoints			
Varying regressors: All equation variables			
Equation Sample: 1984 2018			
F-statistic	9.140087	Prob. F(6,23)	0.0000
Log likelihood ratio	42.67088	Prob. Chi-Square(6)	0.0000
Wald Statistic	54.84052	Prob. Chi-Square(6)	0.0000

Source: Author's calculation (2021)

The F statistic from the above results which is 9.14 is found to be significant judging from the probability value of 0.000. The implication of the null hypothesis of no breaks at specified points is rejected. This further supports the above F analysis that there is structural break between the military and the civilian regimes with respect to the GDP of Nigeria during the period of observation.

3.3. Stability test for the model

The essence of this test is to confirm whether there is actually a sharp departure of Nigerian gross domestic product during civilian regime from what was previously obtained during the military regime. The result is presented in the Figure 2.

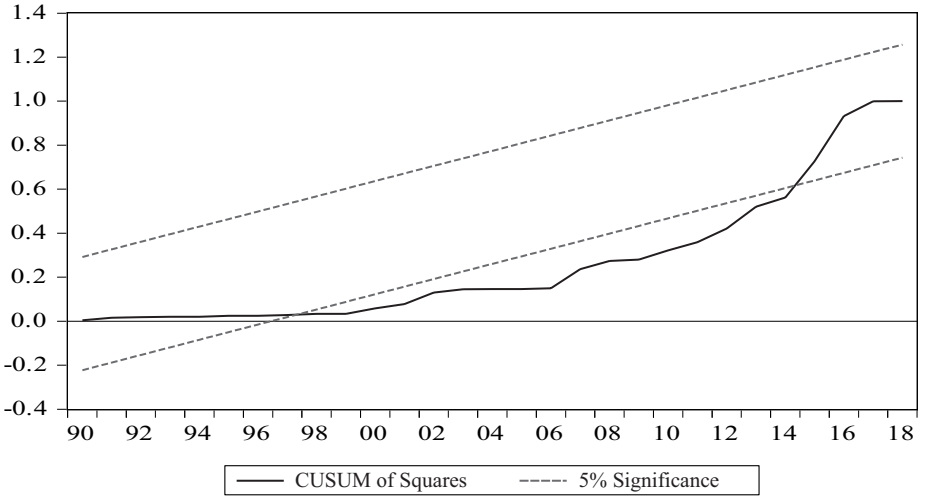


Figure 2: Stability test for the model
Source: Computed by the authors

The blue line outside the boundary line of 5% level of significance is an indication of non-stability of the country's gross domestic product during the period of observation. Although the concern of the study is more for 1999 when the country returned to the civil rule, the noticeable departure from the normal trend of the country's gross domestic product was in 1997. This coincided with the period the military regime of Abacha facing legitimacy challenges from civil societies in the country.

However, with the introduction of dummy variables with zero covering the period of military regime and 1 covering the period of civilian regime, the instability was corrected and the result is as shown in the Figure 3.

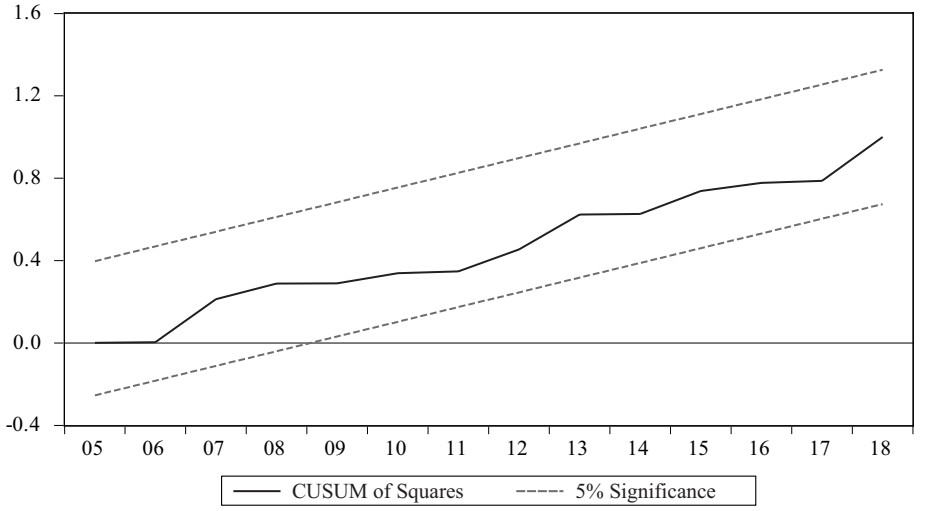


Figure 3: Adjusted stability test for the model
Source: Computed by the author

With the introduction of the dummy variables using zeros for military periods and 1s for civilian periods, the noticed instability was corrected and the model becomes stable as shown with the blue line falling within 5% significance level boundary.

4. DISCUSSION OF RESULTS

Since the results of the Chow test indicate the presence of structural break, this implies that three models estimated are valid. From the results, two of three estimates are in conformity with economic theory that affirms positive relationship

between the determinants of aggregate demand and aggregate demand itself with the exception of import. This means that the estimate for the military regime that shows a negative relationship between government expenditure and gross domestic product is at variance with economic theory of positive relationship. The most feasible explanation for this is connected with high level of corruption that are associated with military regimes especially money laundering, a major characteristic of all military regimes but most prominent in Abacha regime of 1993-1998.

A juxtaposition of the coefficients of the two regimes shows that out of five variables that make up the aggregate demand, the military regime only fares better in the area of export, where the coefficient of 0.219 exceeds that of the civilian of 0.201. In other variables of consumption, investment, government expenditure and import, the civilian regime fares better that military as the coefficients of 0.524, 0.433, 0.012 and -0.0129 exceed that of 0.519, 0.429, -0.010 and -0.148 for civilian and military regimes respectively.

The fact that all observations have been brought down to logarithm shows that a unit rise in household consumption under the civilian regime means that the gross domestic product will increase by 0.524, while a unit rise in household consumption will increase GDP by 0.519 unit under the military regime. For the case of government expenditure, a unit rise in government expenditure raises GDP by 0.012 unit under civilian regime, while a unit rise in government expenditure decreased GDP by 0.0129 unit under the military regime.

In all three estimates, the t values (represented by the figures in parenthesis) are significant at both 1% and 5% for all variables with the exception of the government expenditure variable under the military regime. This implies that all variables individually belong to the model.

In terms of serial correlation that implies biasedness in terms of the result obtained, with the Durbin Watson of 1.47 and 2.58 for civilian and military regimes respectively, using the rule of thumb, it can be evidently concluded that the model for military regime implies the absence of serial correlation, while there is inconclusive evidence to suggest the presence of serial correlation in the model for civilian regime.

5. CONCLUSION AND RECOMMENDATION

Gross domestic product is the commonest economic variable that is used to measure economic performance, either for intertemporal or international comparison. Nigeria as a country has been ruled since independence by two sets of

regimes: the military and the civilian. Arguments were and still are concerned with which of the two regimes favoured the country economically. The study therefore estimates the gross domestic product of Nigeria using Chow test. The essence of Chow test is to determine if there was a structural break from the point the country fully began civilian dispensation from the previous military regime. Using both the F statistic and the Chow test, the results show that there was indeed a structural break between the military regime and the civilian regime. This result was further confirmed by the Cusum Square test that shows that the overall model was unstable prior to correction. The results further show that out of five components of aggregate demand, four of the variables have coefficients higher during the civilian regime than the military.

The study therefore concluded that civilian rule is better economically than military rule in Nigeria. It is therefore recommended that politicians and political office holders should act within the ambit of the law and do everything humanly possible to sustain the democracy the country is currently enjoying.

REFERENCES

Abiola, A. (2019). *Macroeconomics Illustrated*. An unpublished lecture notes on Intermediate Macroeconomics. Oyo, Oyo State, Nigeria: Ajayi Crowther University, Ajayi Crowther University

Adebayo, G.A. (2016). Forecasting the Gross Domestic Product in Nigeria using Time Series Analysis and a Sample Frame of 1960-2015. *Journal of Business and African Economy*, *2*(2)1-14.

Akanji, F. F. (2019). *Reading Nigeria's Political History*. The Republic, June 23 Edition. Retrieved from: https://republic.com.ng/june-july-2019/reading-nigeria-political-history/

Alfajarat, J. & Alalaya. M. A. (2017). Determinants of Growth GDP per Capita through Panel Data Analysis in Selected Arab Countries. *Global Advanced Research Journal of Management and Business Studies, 6*(5), 121-139.

Ali, A & Salif, S. (2017). Determinants of Economic Growth in Pakistan: A Time Series Analysis. *European Online Journal of Natural and Social Sciences, 6*(4), 686-700

Anazor, E. C. (2011). *Good Leadership and Governance in Nigeria: A Comparison of Military Rule and Civilian Rule (1985-2017)*. An Unpublished M.Sc Thesis Submitted to the Department of Public Administration and Local Government

Anyiwe, M.A. & Oziegbe, A. (2006). Democracy and Economic Growth: Statistical Evidence from Nigeria 1960-2002. *Journal of Applied Sciences, 6, 257-265.*

Babalola, B. T. A., Salako, M. A., Yusuf S. A. and Egbekunle, S. O. (2015). Comparative Analysis of Sectoral Civilian and Military Government Expenditures on Economic Growth in Nigeria: ARDL Approach" *Journal of Applied Economics and Business,* 3(1), 52-73.

Babatola, J. E. T. (2014). *Politics and Power Struggles in Nigeria: 1945-1999*. Department Postgraduate Seminar Paper. Ekiti, Nigeria: Ekiti State University.

Chizonde, B. (2016). *The Macroeconomic Determinants of Economic Growth in Zambia: Do Copper Prices Matter.* An unpublished M.A. Dissertation submitted to the Department of Economics, University of Dar es Salaam. Dar es Salaam, Tanzania: University of Dar es Salaam

Chow, G.C. (1960). Tests of Equality between Sets of Coefficients in Two Linear Regressions. *Econometrica, 28*, 591-605.

Egbulonu, K.G. & Ajudua, A. (2017). Determinants of Economic Growth in Nigeria: A Macroeconomic Approach. *International Journal of Innovative Finance and Economics Research*, *5*(1), 22-33.

Ehwarieme, W. (2011). The Military Factor in Nigeria's Democratic Stability. *Sage Journal, 37*(3), 494-511.

Etim, O. F. & Ukpere, W. I. (2012). The Impact of Military Rule on Democracy in Nigeria. *Journal of Political Science*, *33*(5), 285-292.

Hashim, E., Norimah R., Nurhanani A., Norasibah A.,Syazwani, M. B., & Ng W. R. (2018). Determinants of Real GDP in Malaysia. *The Journal of Social Sciences Research*, *3*, 97-103.

Ismaila, M. & Imoughele, L. E. (2015). Macroeconomic Determinants of Economic growth in Nigeria: A Cointegration Approach. *International Journal of Academic Research in Economics and Management Sciences 4*(1),34-46.

Iyoha, M. A., Oyefusi, S. A. & Oriakhi, D. E. (1998). *An Introduction to Modern Economics*. Benin City, Edo State, Nigeria: Marej Publishers

Johansen, S (1988). Statistical Analysis of Cointegration Vectors. *Journal of Economic Dynamics and Control*, *12* (2-3), 231-254.

Johansen, S. & Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration —with Applications to the Demand for Money. *Oxford Bulletin of Economics and Statistics*, *52*, 169–210.

Kifordu, H. A. (2013). Nigerian Political System Since Political Independence: Changes and Trajectories. *UNIEURO*, *Brasilia*, *12,* 87-124

Luitel, H.S. & Mahar, G. J. (2015). A Short Note on the Application of Chow Test of Structural Break in US GDP. *International Business Research*, *8*(10), 112-116.

Maingi, N. J. (1999). Determinants of the Real Economic Growth in Pakistan: A Time-series Analysis 1976-2015. *European Online Journal of Natural and Social Sciences*.

Odinkalu, C. A. (2001). The Management of Transition to Civil Rule by the Military in Nigeria (1966-1996). *IFRA*, 57-99

Ogbeidi, M. M. (2012). Political Leadership and Corruption in Nigeria Since 1960: A Socio-economic Analysis. *Journal of Nigerian Studies*, *1*(2), 1-25.

Panshak, Y., Civcir. I. & Ozdeser, H.(2020). Towards Determining Nigeria's Economic Growth Path: A balance of Payment Constrained Growth Approach. *EconomiA, 21*(1), 104-119.

Pesaran, M.H. & Shin, Y. (1999). An Autoregressive Distributed Lag Modelling Approach to Cointegration Analysis. *Econometrics and Economic Theory in the 20th*

Century: The Ragnar Frisch Centennial Symposium, Strom, S. (ed.). Cambridge, UK: Cambridge University Press.

State House, Federal Republic of Nigeria (2019). Past Presidents and Heads of State. Retrieved from: www.statehouse.gov.ng

Uchechukwu, G. & Ibiok, E. U. (2015). Sectoral Contributions to Nigeria Gross Domestic Product using VAR Approach. *Global Journal of Pure and Applied Sciences, 21*(2), 137-143.

Uwakaeme, O. S. (2015). Economic Growth in Nigeria: An Empirical Investigation and Causal Relationship (1980-2012). *America Journal of Economics, 5*(1), 9-20.

ПРОЦЈЕНА БРУТО ДОМАЋЕГ ПРОИЗВОДА НИГЕРИЈЕ ТОКОМ ВОЈНОГ И ЦИВИЛНОГ РЕЖИМА: ТЕСТ ЧОУ

[1] Абидеми Абиола, Економски факултет, Аџеји Краутер Универзитет у Ојју, држава Ојо, Нигерија
[2] Расак Адетуњи Адефаби, Економски факултет, Емануел Елајанде, Учитељски факултет у Ојју, држава Ојо, Нигерија

САЖЕТАК

Бруто домаћи производ је најчешћа економска варијабла која се користи за мјерење економских перформанси - било за поређење током времена или за међународно поређење. Од успостављања своје независности Нигеријом владају два режима: војни и цивилни. Расправе и даље трају око тога који је од та два режима наклоњен земљи у економском смислу. Наша студија стога процјењује бруто домаћи производ Нигерије помоћу теста Чоу. Суштина теста Чоу је у утврђивању да ли је дошло до структурног прекида у тренутку када је држава у потпуности започела цивилно ослобађање од претходног војног режима. Користећи Ф статистику и тест Чоу, резултати показују да је заиста постојао структурни прекид између војног и цивилног режима. Овај резултат је даље потврђен CUSUM-квадрат тестом који показује да је укупни модел прије корекције био нестабилан. Надаље, резултати показују да од пет компоненти агрегатне тражње, четири варијабле имају више коефицијенте током цивилног режима у односу на војни. Закључак студије јесте, између осталог, да је цивилна владавина економски боља од војне владавине у Нигерији. Препоручено је да политичари и носиоци политичких функција дјелују у оквирима закона како би се одржала тренутна демократију.

Кључне ријечи: *бруто домаћи производ, војни режим, цивилни режим, тест Чоу.*

BUSINESS GROWTH MANAGEMENT IN REPUBLIC OF SRPSKA

1 Saša Vučenović, University of Banja Luka, Faculty of Economics, Bosnia and Herzegovina
2 Branka Zolak Poljašević, University of Banja Luka, Faculty of Economics, Bosnia and Herzegovina
3 Igor Mišić, University of Banja Luka, Faculty of Economics, Bosnia and Herzegovina
*Corresponding author E-mail: sasa.vucenovic@ef.unibl.org
1 ORCID ID: 0000-0001-5435-8751
2 ORCID ID: 0000-0003-3715-9616
3 ORCID ID: 0000-0003-0304-3279

ARTICLE INFO
Original Scientific Paper
Received: 24.11.2020
Revised: 23.03.2021
Accepted: 24.03.2021

doi 10.7251/ACE2134045V
UDC
005.915:[338.48:658.8(497.6RS)

Keywords: *management, enterprise growth, sustainable growth rate, growth measurement*

JEL Classification: M20, M21

ABSTRACT

The research methodology starts from the calculation of the coefficient for each individual company in order to obtain the indicators by calculating the arithmetic mean, median and quartile. As econometric stochastic models have little value for predicting or explaining the growth process at the level of individual companies, the central subject of interest is understanding the growth process at the level of an individual company. The sustainable growth rate of a company depends on the activity of the company. Numerous factors can affect the growth of a company, but the influence of individual factors on the growth of a company is rarely significant and permanent. The results of the research indicate a very asymmetric distribution of the size of enterprises, with a small number of large enterprises and a large number of small enterprises. The model of sustainable growth is an effective tool for financial planning and directing business policy towards stimulating growth in certain industries.

1. INTRODUCTION

Growth management is a specific problem of corporate governance. Most managers view growth as a variable to be maximized. However, maximizing growth is not always a positive strategy and can often lead to bankruptcy.

The growth of the company is a process of continuous positive business activities of the company, which is observed from different aspects such as: financial,

strategic, structural and organizational aspects (Wichkam, 2006). Although the company growth is viewed from the aspect of the variability of these factors, factors such as strategic growth, structural growth and organizational growth, in fact, represent the development of a company. The terms "growth" and "development" are often identified in the literature as one term, although they have different semantic meanings. The company growth is manifested through quantitative indicators, while the company development is manifested through qualitative indicators, which, together with their changes, indicate the improvement of the existing situation (Isaković, 2015).

Companies go through different phases of the business cycle in their development. The first phase is the start-up phase in which funds are used to develop the product and stabilize its sales in the market. In the next, the second phase, the company achieves significant growth and operates at a profit, but to maintain the growth it usually needs additional funds (borrowed or equity). The third phase of the life cycle saturation begins when the company's growth begins to decline, i.e. when the company does not invest in projects that would provide growth. The last phase is a decline: the company is on the verge of profitability, it generates cash which is reinvested internally, i.e. in the company itself, and it suffers a decline in sales. In the last two phases companies use managerial skills to find profitable investment alternatives for new products or invest in the acquisition (takeover) of other companies that are still in the growth phase.

Initial research on company growth was based on the neoclassical theory of optimal company size, which involves maximizing profits. A significant contribution to the theory of enterprise growth is Penrose's theory of growth, which sees enterprise growth as a learning process through the work of managers and other employees. Managers become more productive over time, gain new knowledge and become more innovative, and focus on business expansion. Managers who are focused on the growth generate higher costs than expected to achieve the growth. Firms that grow fast have higher operating costs than those that do not have rapid growth. This is called the Penrose effect (Coad, 2007). The question is what are the factors that affect the company growth? Most research is based on the analysis of the company size and age and their impact on growth. According to Gibrat's law or the law of proportional effect, the growth rate of a company is independent of the company size in the initial period (Gibrat, 1931).

The hypothesis that the growth of a company is independent of its size has been tested empirically several times and most tests have not confirmed its accuracy. In short, empirical research indicates the existence of a negative correlation between the company size and the company growth, with a tendency to reduce the

size variance as the company size grows. In other words, small businesses as a whole have a higher but more chaotic rate of war (Coad, 2007). In addition to the company size, there are a number of other indicators that affect the growth of the company. Indicators can be: at the level of companies (innovation, profitability, productivity, etc.), at the level of industry (degree of concentration, market size,) and macroeconomic indicators (GDP growth, employment, inflation, tax policy). There are a large number of indicators that can show the company growth. The most common ways to measure growth are shown in the following table (Gruenwald, 2015).

Table 1. Methods of measuring enterprise growth

Indicators	Authors
Income, Sales growth	Mishina et al. (2004); Shaw, Duffy, Johnson, and Lockhart (2005); Gardner (2005); Simsek, Veiga, Lubatkin, and Dino (2005) Zatzick and Iverson (2006); Sine, Mitsuhashi and Kirsch (2006); Arthaud-Day et al. (2006); Moreno and Casillas (2007); Holzl (2009); Anaydike-Danes et al. (2009); Evangelista and Vezzani, (2010); Cassia and Minola (2012); Murmann et al. (2014); Beers and Zand, (2014); Coad et al. (2014)
Operating profit, Net profit, EBITDA	Shaw, Gupta & Delery (2005);
Market share	-
Employment growth	Shaw, Duffy, Johnson, and Lockhart (2005); Holzl (2009); Murmann et al. (2014); Anaydike-Danes et al.(2009); Carz Nitzki and Delanote (2013); Barbaro et al. (2014)
Cover point	-
Productivity	Boer and During (2001); OECD (2006); Rocchina-Barrachina et al. (2010); Urgal et al. (2013)
ROE	Shaw, Gupta and Delery (2005); Westphal and Bednnar (2005)
ROI, ROIC	Luo and Chung (2005); Tan and Tan (2005)
ROA	Miller and Eden (2006); Arthaud-Day, Certo, Dalton and Dalton (2006); Sanders and Tuschke (2007); Goerzen and Beamish (2005)
TSR	Kumar (2005); Johnson, Ellstrand, Dalton and Dalton (2005)
EVA	-

Source: Gruenwald, R.K. (2015): Measuring Growth of the Firm: Theoretical Considerations, Cracow University of Economics, Poland

The aim of this paper is to explain and describe scientifically the movement of the growth rate of enterprises in Republic of Srpska, and to define the methodology for measuring the balanced growth rate. Also, the aim of the paper is to describe the movement of the growth rate of enterprises in different industries.

The research hypothesis we set is: "The growth rate of a company depends on the industry of the company."

The growth of the company means the growth of the company's income. The growth of sales volume requires greater commitment of funds (growth of assets) for which sources must be provided (growth of liabilities). Retained earnings, as well as new loans or bond issues, can generate money, but only to a limited extent. If a company does not want to issue shares and sell them, borrowed capital and internally generated resources (retained earnings) are the growth limit.

2. MATERIAL AND METHODS

The two relevant sources of financing assets are equity and borrowed capital. In the context of this research, we will address the issue of growth sustainability (balanced growth). The growth rate of liabilities and the growth rate of equity are the basic growth limits. The borrowing capacity of the company is limited by creditworthiness (ability), which implies that the basic growth limit is the one that refers to the possibility of growth from equity.

In order to explain the sustainable growth of the company, we will start from the following assumptions:

a) the company strives to grow as much as its market opportunities allow,
b) business owners do not want to issue and sell a new issue of shares,
c) the company has a desired capital structure and defined dividend policy.

The research methodology goes through the following steps. The achieved growth rate is calculated for each company. The realized growth rate of the company is calculated as the ratio of the increase in the value of the company's capital in relation to the capital of the previous year. The sustainable growth rate of a company[1] can be calculated using the following formula:

$$g = P \times R \times A \times T,$$ (Stowe, 2000)

where:

g - company growth rate,

P - profit margin or net profit rate,

R - retained earnings rate,

A - turnover ratio of total assets,

1 Balanced growth rate (g) is the growth rate at which the financial flexibility of the company is not impaired.

T - the ratio of total assets to equity.

In the previous formula PAT (profit margin, total assets turnover ratio and equity multiplier) essentially represents ROE (return on equity).

Based on the above, we can derive the following growth formula:

$$\mathbf{g = R \times ROE},$$

where R is the rate of retained earnings and ROE is the rate of return on its own funds.

In essence, the variable R denotes the financial policy of management in relation to dividends and retained earnings, while ROE is an indicator of business performance of the company. Within ROE, another indicator explains the financial policy of the company and that is the multiplier of equity. Also, one of the ways we can write down the formula for sustainable growth is:

$$g = R \times T \times ROA,$$

where:

R - retained earnings indicator,

T - equity multiplier,

ROA (return on assets) - operating performance of the company, i.e. the rate of return on total assets.

The growth rate of the company can be higher or lower than g, or the rate of sustainable growth of the company. The retained earnings ratio R = g / ROE was calculated for each company that operated with a profit assuming growth sustainability. By determining the relationship between the investment decision on optimal growth and dividend payment policy, the Higgins model of sustainable growth was expanded with a model that optimizes the sustainable growth rate and the dividend payment ratio. (Chen et al., 2013). The indicator is calculated for each company. Companies are divided into three segments, small, medium and large. The obtained values were then sorted from the highest to the lowest value, and the formed list was then divided into four equal groups on the basis of the first quartile, the median and the third quartile. An overview is given in the following chart.

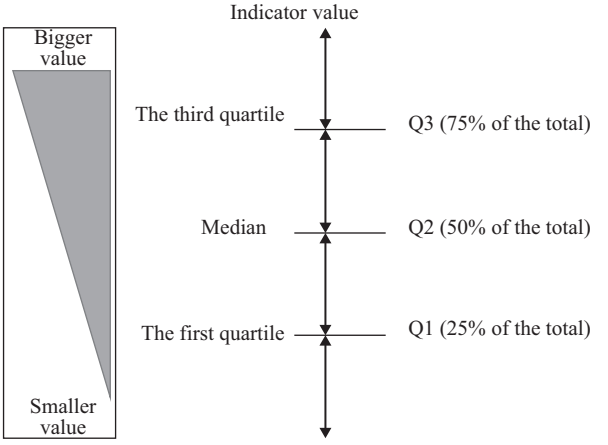


Figure 1. Graphic display of the list

Source: Authors

There are several reasons why medians and quartiles are used instead of the arithmetic mean. Median and quartiles eliminate the influence of extremely large and extremely small values. They also give a more accurate picture of the pointer than the ordinary arithmetic mean. Between the first and third quarters there are 50% of the observed companies (Vučenović, 2017).

The research was performed on the database of financial statements of the companies from Republika Srpska in 2017 and 2018, with the analysis of the companies involved in a group of small, medium and large companies, or eliminated by the micro enterprises that are defined as such in the Law on Accounting and Auditing of Republika Srpska. After that, the company was selected according to the growth in the following categories: assets, capital and total company revenues. The analysis included 795 companies from Republika Srpska.

Out of the observed 795 companies, 309 companies are from the wholesale and retail trade industry, 26% are from the processing industry, while other activities do not exceed 10% of the total number of observed companies.

For further analysis, the companies were divided into three groups. The first group of companies are those with a capital of up to 1.000.000 BAM, the second group of companies are those companies with a capital between 1.000.000 BAM and 5.000.000 BAM, while the third group includes the companies with a capital of over 5.000.000 BAM. The largest number of companies belongs to the first group of companies, i.e. 486 companies, the second group consists of 213, while the third group of companies includes 96 companies. In the observed sample, we analysed the optimal level of company growth with certain assumptions, and that

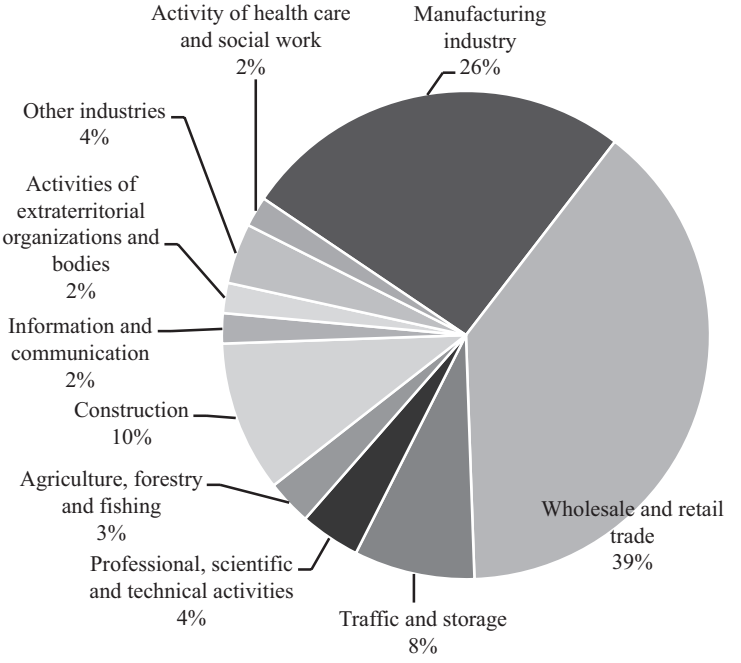


Figure 2. The structure of enterprises in the sample by the type of industry

Source: Authors

is the debt-to-equity ratio of at least 2:1, which means the share of capital should not be less than 33%, so that the company retains 70% of last year's net profit.

While comparing data, we used measures of central tendency: arithmetic mean, median and quartiles. The use of the median is more in line with the set description, because it eliminates the effects of extreme values on the whole set. The research methodology was based on the calculation of the coefficient for each individual company in order to obtain the arithmetic mean, median and quartile to obtain the relevant indicators. As econometric stochastic models have little value for predicting or explaining the growth process at the level of individual companies, the central subject of interest is understanding the growth process at the level of an individual company. Empirical data indicate a very asymmetric size distribution of enterprises, with a small number of large enterprises and a large number of smaller enterprises.

This distribution of enterprise size can be explained by stochastic processes in which variables the size of enterprises and the result of cumulative random shocks over time are observed. The distribution of a company by size is the result of random processes.

Table 2. Comparative presentation of the share of capital in the total liabilities of the company shown by the company size

Companies	1QUKP18	1QUKP17	MUKP18	MUKP17	ASUKP 18	ASUKP 17	3QUKP18	3QUKP17
I group of companies with up to one million BAM of capital	20.46%	16.91%	37.90%	35.21%	42.90%	40.49%	61.63%	58.61%
II group of companies from one million to 5 million BAM of capital	45.78%	45.33%	68.74%	65.97%	63.35%	62.12%	81.65%	82.01%
III group of companies with over 5 million BAM of capital	58.98%	55.71%	74.42%	72.82%	70.59%	69.73%	86.80%	88.19%
Grand Total	28.22%	24.79%	51.22%	49.97%	51.72%	49.81%	73.89%	73.03%

Source: Author's calculations 2

When we look at all comparative data in the previous table, through all measures of the central tendency, we notice that there is an increase in the share of capital of the observed companies in 2018 compared to 2017. On average, companies meet the requirement of the total amount of capital which is above 33%. If we look at the groups of companies we can conclude that the largest share of capital in sources of financing belongs to the companies from group III or companies with over 5 million capital.

The highest average rate and the highest median share of capital in the total liabilities of the company have companies from the hospitality industry, followed by finance and insurance, while the lowest average participation rate have companies from the field of education, agriculture, forestry and fishing, and the lowest median have companies from the field of transport and storage. The highest growth rate of the median share in capital in total liabilities is recorded by the enterprises engaged in accommodation and catering, hotel and catering, while the highest rate of median share in capital participation in liabilities of the company is recorded by the companies engaged in mining and quarrying.

2 Legend labels: 1QUKP18 – the first quartile of the share of capital in liabilities in 2018, 1QUKP17- the first quartile of the share of capital in liabilities in 2017, MUKP18 - median equity participation in liabilities in 2018, MUKP17 - median equity participation in liabilities in 2017, ASUKP 18 – arithmetic mean of equity participation in liabilities in 2018, ASUKP 17 – arithmetic mean of equity participation in liabilities in 2017, 3QUKP18 – the third quartile of equity participation in liabilities in 2018, 3QUKP17 – the third quartile of equity participation in liabilities in 2017.

Table 3. Comparative presentation of the share of capital in the total liabilities of the company shown by industries

Industries	1QUKP 18	1QUKP 17	MUKP 18	MUKP 17	ASUKP 18	ASUKP 17	3QUKP 18	3QUKP 17
Administrative and support service	25.33%	17.62%	42.67%	33.48%	46.24%	41.60%	59.06%	59.10%
Activities of extraterritorial organizations and bodies	64.97%	60.59%	71.29%	71.26%	64.28%	65.53%	74.71%	74.68%
Accommodation, food preparation and serving activities	71.32%	55.23%	91.54%	77.51%	83.80%	66.19%	94.38%	91.62%
Health and social work	38.31%	31.20%	57.68%	62.39%	59.15%	54.86%	81.19%	79.99%
Financial companies and insurance industry	78.57%	67.85%	85.13%	85.60%	78.82%	76.43%	89.78%	88.38%
Construction industry	34.28%	31.91%	50.72%	50.13%	51.84%	51.29%	75.28%	76.04%
Information and communication	35.21%	39.47%	69.20%	64.67%	61.23%	58.91%	83.68%	76.84%
Public administration and defense; compulsory social insurance	65.45%	65.51%	76.65%	76.52%	76.65%	76.52%	87.85%	87.52%
Education	40.41%	33.20%	40.41%	33.20%	40.41%	33.20%	40.41%	33.20%
Agriculture, forestry and fishing	10.53%	5.43%	42.86%	47.38%	44.14%	44.40%	72.53%	71.38%
Real estate business	14.67%	17.89%	52.60%	52.74%	53.20%	53.04%	92.99%	93.03%
Manufacturing industry	28.44%	24.75%	49.49%	46.02%	49.45%	47.00%	70.36%	69.25%
Traffic and storage	28.72%	27.27%	39.10%	38.51%	45.05%	45.28%	61.60%	65.81%
Professional, scientific and technical activites	38.24%	32.27%	60.22%	58.03%	55.91%	54.41%	80.08%	77.51%
Wholesale and retail trade	25.55%	21.46%	50.34%	50.22%	52.11%	49.90%	73.68%	72.90%
Mining and quarrying	42.70%	36.87%	44.22%	55.09%	51.21%	51.48%	80.15%	77.30%
Total	28.22%	24.79%	51.22%	49.97%	51.72%	49.81%	73.89%	73.03%

Source: Author's calculations

Based on the research methodology previously defined for each company, a sustainable growth rate was calculated for 2018. Sustainable growth rates by the group of companies are shown in the following table.

Table 4. Sustainable growth rates of enterprises by the groups of enterprises[3]

Companies	1QOSR	MOSR	ASOSR	3QOSR
I group of companies with up to one million BAM of capital	1.87%	4.82%	11.71%	10.38%
II group of companies from one million to 5 million BAM of capital	2.18%	5.03%	6.70%	8.62%
III group of companies with over 5 million BAM of capital	2.14%	4.08%	5.15%	7.34%
Grand Total	1.93%	4.77%	9.58%	9.35%

Source: Author's calculations

By analyzing the data from the previous table, we conclude that the median is the best way to show a sustainable growth rate. The arithmetic mean is influenced by extreme data, which is seen in the fact that the third quartile is smaller than the arithmetic mean. The total median growth rate for all companies is 4.77%, with companies from the second group having the highest growth rate.

Table 5. Sustainable enterprise growth rates by enterprise industries

Industries	1QOSR	MOSR	ASOSR	3QOSR
Administrative and support service	7.88%	16.99%	16.53%	24.29%
Activities of extraterritorial organizations and bodies	0.69%	1.65%	2.57%	4.01%
Accommodation, food preparation and serving activities	1.72%	7.21%	19.85%	15.74%
Health and social work	5.39%	11.72%	97.12%	26.41%
Financial companies and insurance industry	0.48%	3.53%	10.00%	13.14%
Construction industry	0.81%	4.23%	8.25%	12.60%
Information and communication	1.25%	7.52%	15.82%	25.48%
Public administration and defense; compulsory social insurance	0.55%	1.11%	1.11%	1.66%
Education	1.95%	1.95%	1.95%	1.95%
Agriculture, forestry and fishing	0.28%	1.25%	4.94%	4.71%
Real estate business	1.05%	2.27%	3.07%	4.56%
Manufacturing industry	2.05%	4.49%	6.43%	8.16%
Traffic and storage	1.75%	3.22%	5.53%	6.63%

3 Legend labels: 1QOSR - the first quartile sustainable growth rate, MOSR - median quartile sustainable growth rate, ASOSR - arithmetic mean sustainable growth rate, 3QOSR – the third quartile of sustainable growth rates.

Industries	1QOSR	MOSR	ASOSR	3QOSR
Professional, scientific and technical activites	3.70%	10.37%	17.07%	26.12%
Wholesale and retail trade	2.54%	5.53%	7.97%	8.62%
Mining and quarrying	0.33%	2.50%	4.90%	4.21%
Total	1.93%	4.77%	9.58%	9.35%

Source: Author's calculations

The highest median sustainable growth rate by activity of enterprises is in the activity of Administrative and support service activities with 16.99%, while the lowest median sustainable growth rate is in the activity of Public administration and defence and compulsory social security with 1.11%.

Table 6. Comparative data on the sustainable growth rate of enterprises and growth indicators of income, assets and capital[4]

Companies	ASOSR	MOSR	ASRP	MSRP	ASRA	MSRA	ASRK	MSRK
I group of companies with up to one million BAM of capital	11.71%	4.82%	315.56%	26.34%	93.05%	27.51%	76.30%	33.82%
II group of companies from one million to 5 million BAM of capital	6.70%	5.03%	33.76%	16.37%	25.90%	12.92%	34.76%	16.58%
III group of companies with over 5 million BAM of capital	5.15%	4.08%	22.36%	13.96%	81.20%	10.44%	19.41%	12.37%
Grand Total	9.58%	4.77%	204.65%	20.40%	73.62%	20.15%	58.30%	24.47%

Source: Author's calculations

The previous table shows the arithmetic mean and sustainable growth rate of the company compared to the indicators of revenue growth, capital growth and asset growth. Further analysis shows that the impact on the arithmetic mean of the indicators of growth of income, capital and assets have extreme indicators and the data obtained are not adequate for analysis. If we compare the medians of optimal growth rates with the medians of growth of income, capital and assets, we see that companies from the first group of companies, according to these indicators, are growing several times faster than what is optimal. As the size of the company increases, the difference between these indicators and the optimal growth rate is smaller, although in all groups of medians the sustainable growth rate is lower than the median growth rate of income, capital and assets.

4 Legend of labels: ASOSR - arithmetic mean of sustainable growth rate, MOSR - median quartile sustainable growth rate, ASRP-arithmetic mean of income growth, MSRP median income growth, ASRA arithmetic mean of asset growth, MSRA median of asset growth, ASRK arithmetic mean of capital growth, MSRK median capital growth.

Table 7. Comparative data on sustainable growth rates of enterprises and indicators of growth of income, assets and capital by industries of enterprises

Industries	ASOSR	MOSR	ASRP	MSRP	ASRA	MSRA	ASRK	MSRK
Administrative and support service	16.53%	16.99%	150.26%	137.36%	81.24%	39.32%	136.14%	86.78%
Activities of extraterritorial organizations and bodies	2.57%	1.65%	67.60%	14.04%	44.01%	14.40%	21.24%	12.23%
Accommodation, food preparation and serving activities	19.85%	7.21%	81.44%	14.06%	1085.63%	21.93%	6.42%	4.44%
Health and social work	97.12%	11.72%	23.03%	20.34%	48.51%	39.28%	40.23%	29.77%
Financial companies and insurance industry	10.00%	3.53%	47.57%	30.92%	24.92%	6.24%	29.58%	6.70%
Construction industry	8.25%	4.23%	1236.85%	34.83%	139.71%	25.72%	70.30%	29.75%
Information and communication	15.82%	7.52%	100.87%	48.75%	59.72%	19.80%	87.14%	33.63%
Public administration and defense; compulsory social insurance	1.11%	1.11%	6.49%	6.49%	7.79%	7.79%	7.80%	7.80%
Education	1.95%	1.95%	8.49%	8.49%	50.69%	50.69%	83.41%	83.41%
Agriculture, forestry and fishing	4.94%	1.25%	92.93%	22.28%	61.91%	23.60%	84.27%	25.26%
Real estate business	3.07%	2.27%	168.74%	61.15%	71.35%	39.20%	31.80%	8.49%
Manufacturing industry	6.43%	4.49%	46.48%	24.52%	40.58%	20.72%	61.14%	24.09%
Traffic and storage	5.53%	3.22%	174.52%	17.88%	52.36%	14.11%	34.70%	16.60%
Professional, scientific and technical activites	17.07%	10.37%	236.00%	47.93%	279.15%	24.15%	93.72%	41.70%
Wholesale and retail trade	7.97%	5.53%	97.73%	17.16%	47.34%	19.87%	54.47%	24.59%
Mining and quarrying	4.90%	2.50%	31.18%	28.19%	12.31%	7.58%	14.60%	14.00%
Total	9.58%	4.77%	204.65%	20.40%	73.62%	20.15%	58.30%	24.47%

Source: Author's calculations

The previous table shows comparative data on the sustainable growth rate of the company and indicators of growth of income, assets and capital by activities of the company. All growth indicators of income, capital and asset categories are growing faster than the growth indicators of the sustainable growth rate. The largest differences in growth rates are in the activities of administrative and support service activities, and real estate activities, while the smallest difference in the rates is in public administration and defense.

Table 8. Comparative data on sustainable growth rates and actual growth rates by groups of companies[5]

Companies	ASOSR	ASSSR	MOSR	MSSR	1QOSR	1QSSR	3QOSR	3QSSR
I group of companies with up to one million BAM of capital	11.71%	52.47%	4.82%	6.11%	1.87%	1.18%	10.38%	61.38%
II group of companies from one million to 5 million BAM of capital	6.70%	7.17%	5.03%	0.82%	2.18%	0.11%	8.62%	30.44%
III group of companies with over 5 million BAM of capital	5.15%	2.72%	4.08%	0.29%	2.14%	0.03%	7.34%	25.43%
Grand Total	9.58%	34.32%	4.77%	2.72%	1.93%	0.41%	9.35%	44.42%

Source: Author's calculations

The previous table compares the sustainable growth rate with the actual growth rate of the company according to the measures of the central tendency. The data shown by the arithmetic mean as in the previous analyzes are not relevant because extreme values have too much influence. If we look at the median of the optimal growth rate and the median of the real growth rate, we see that companies grow within a sustainable growth rate. Companies in the first group grow faster than sustainable growth, while companies in the second and third groups grow slower than sustainable growth.

5 Legend: ASOSR - arithmetic mean of sustainable growth rate, ASSSR - arithmetic mean of real growth rate, MOSR - median quartile of sustainable growth rate, MSSR - median quartile of real growth rate, 1QOSR - first quartile of sustainable growth rate, 1QSSR - first quartile of real growth rate 3QOSR - third quartile of sustainable growth rate, 3QSSR - third quartile of actual growth rate.

Table 9. Comparative data on sustainable growth rates and actual growth rates by enterprise activities

Industries	ASOSR	ASSSR	MOSR	MSSR	1QOSR	1QSSR	3QOSR	3QSSR
Administrative and support service	16.53%	78.06%	16.99%	16.22%	7.88%	11.21%	24.29%	111.05%
Activities of extraterritorial organizations and bodies	2.57%	1.06%	1.65%	0.54%	0.69%	0.04%	4.01%	32.63%
Accommodation, food preparation and serving activities	19.85%	0.67%	7.21%	0.05%	1.72%	0.01%	15.74%	212.48%
Health and social work	97.12%	524.96%	11,.72%	5.70%	5.39%	0.38%	26.41%	56.91%
Financial companies and insurance industry	10.00%	7.97%	3.53%	0.66%	0.48%	0.01%	13.14%	38.06%
Construction industry	8.25%	28.64%	4.23%	6.81%	0.81%	0.50%	12.60%	64.59%
Information and communication	15.82%	44.24%	7.52%	4.81%	1.25%	0.34%	25.48%	47.93%
Public administration and defense; compulsory social insurance	1.11%	0.22%	1.11%	0.22%	0.55%	0.11%	1.66%	9.29%
Education	1.95%	29.86%	1.95%	29.86%	1.95%	29.86%	1.95%	50.69%
Agriculture, forestry and fishing	4.94%	38.76%	1.25%	1.80%	0.28%	0.26%	4.71%	46.88%
Real estate business	3.07%	2.85%	2.27%	0.53%	1.05%	0.06%	4.56%	113.89%
Manufacturing industry	6.43%	25.34%	4.49%	2.83%	2.05%	0.38%	8.16%	47.27%
Traffic and storage	5.53%	11.90%	3.22%	1.18%	1.75%	0.26%	6.63%	32.85%
Professional, scientific and technical activites	17.07%	28.82%	10.37%	5.84%	3.70%	2.05%	26.12%	69.45%
Wholesale and retail trade	7.97%	25.34%	5.53%	2.57%	2.54%	0.51%	8.62%	39.90%
Mining and quarrying	4.90%	2.07%	2.50%	3.22%	0.33%	0.31%	4.21%	9.48%
Total	9.58%	34.32%	4.77%	2.72%	1.93%	0.41%	9.35%	44.42%

Source: Author's calculations

The previous table compares the sustainable growth rate with the actual growth rate of the company according to the measures of the central tendency. If we look at the median sustainable and real growth rates, we see that construction and education activities have a larger deviation of the real growth rate from the optimal growth rate, while other activities grow at a rate that is lower than the sustainable growth rate or slightly higher than sustainable.

3. DISCUSSION

Enterprise growth can be expressed in absolute or relative values. Relative indicators are mostly used by small enterprises, while growth expressed in absolute indicators is preferred by large enterprises. The disadvantages of the relative and absolute indicator are reflected in the fact that faster relative growth of the company means a better position in the market. In contrast, the company can achieve growth expressed in absolute values, while reducing its market share. According to neoclassical theory, assuming perfect competition in the market, the company grows until it reaches a minimum point on the average cost curve. Thus, the growth of enterprise income is an asymptotically decreasing function of the relative size of the enterprise within the activity or market in which it competes, while in the same market, smaller enterprises grow faster than large enterprises (Lehtoranta, 2010.)

The influential theory of enterprise growth is the one according to which the growth of an enterprise is proportional to the speed at which it acquires or accepts and applies new technological, organizational and managerial knowledge. Innovation activities are proving to be the key to the growth of small businesses (Hassan and Hart, 2016). However, complications associated with empirical testing of this theory and its extensions, due to the lack of reliable quantitative measures of relevant enterprise characteristics, have led to this enterprise growth theory having a greater impact on research related to strategic management and enterprise competitiveness than to research dealing with their growth.

In practice, enterprise growth rates have a pronounced stochastic trend (the size of an enterprise follows a "random walk" model), and the apparent relationships between growth rates between different enterprises are temporary and unpredictable. Therefore, the new generation theoretical models, which are still in development, accept the stochastic nature of enterprise growth rates and concentrate on explaining the impact of stochastic "jumps" in their time series. The question of the shape and stability of the empirical distribution of enterprise growth rates at different stages of the economic cycle is also not trivial, given that the expect-

ed value and curvature of this distribution are pro-cyclical, while the standard deviation and asymmetry is non-cyclical. The statistical relationship between the size of an enterprise and the standard deviation of its growth rate from the arithmetic mean over time is in practice negative. This means that the growth rates of a larger company are less volatile over time than the growth rates of a comparably smaller company and that the autocorrelations of the growth rates of individual companies are determined by the size of that company. The empirical rule is that the autocorrelation of growth rates is positive for larger companies and negative for smaller companies. Furthermore, it has been shown that the autocorrelation of a company's growth rate also depends on the realization of the company's growth rate in previous periods. This suggests the importance of including macroeconomic variables among explanatory variables for analyzing enterprise growth rates in the data panel, which includes data from different phases of the business cycle. There is an interaction between the size of the company and the phase of economic growth, so in the phase of prosperity smaller companies grow faster, while in the downward phase and in the recovery phase this is done by larger companies (Coad, 2009.)

The results of the research indicate a very asymmetric distribution of the size of enterprises, with a small number of large enterprises and a large number of smaller enterprises. Empirical findings show that organization, optimal production and financial capacity are the key determinants of the growth process of industrial small and medium enterprises (Levratto et al., 2010).

Numerous factors can affect the growth of a company, but the influence of individual factors on the growth of a company is rarely significant and permanent. A study conducted in Greece found that the factors that positively affect the company growth are the following: profitability, liquidity, long-term financing and employee productivity, while they have a negative impact on the growth of sales of fixed assets. The total assets used as a size variable did not prove significant (Voulgaris et al., 2003.). Access to external sources of financing is a major obstacle to business growth. The existence of a positive relationship between characteristics and growth has been established. Enterprise size and growth are inversely proportional (Tarfasa et al., 2016). The results of the research on enterprise growth factors in Belgium showed that: 1. innovations have a positive impact on enterprise growth; 2. solvency negatively affects the growth of the company; 3. profitability, financial leverage and liquidity do not have a significant impact on the growth of the company; 4. innovation has only a positive impact on the growth of small enterprises and does not affect the growth of large enterprises. Finally, the negative impact of solvency on company growth is significant only for companies in the manufacturing sector (Loi and Khan, 2012).

The size and height have a negative relationship. The size of the company does not significantly affect the profitability of the company (Kouser et al., 2012).

The total median growth rate for all companies in the sample of the survey is 4.77%, with companies from the second group having the highest growth rate. The highest growth rate of the median share in the capital in the total liabilities have companies in the activities of providing accommodation, food preparation and serving, hotel business, while the highest rate of decline of the median share of capital in the liabilities of the company was recorded by the companies engaged in mining and quarrying. The median is a better measure of showing a sustainable growth rate relative to the arithmetic mean. The arithmetic mean is influenced by extreme data, which we see in the fact that the third quartile is smaller than the arithmetic mean. The empirical statistical distribution of enterprise growth rates roughly corresponds to a symmetric exponential theoretical distribution (Laplace's schedule). The main implication is that the most economically important companies are in the right tail of the empirical distribution of growth rates, i.e. there is no excessive economic sense of the average value of this distribution, as it is common in regression-type econometric research. (Coad, 2009).

Some authors used logarithmic values to avoid inequality in the samples. However, the problem arises when interpreting the results of the model. In linear form the interpretation is simple. When x changes by one unit, then y changes by P units. When doing logarithm, the interpretation is also simple. The problem arises when comparing the results obtained using these methods (Kouser et al., 2012).

When we compare the median optimal growth rates with the medians of growth of income, capital and assets, we see that companies from the first group of companies measured by these indicators grow several times faster than optimal, as the size of companies increases, so the difference between these indicators and optimal growth rates is lower, although for all groups of medians the sustainable growth rates are lower than the median growth rates of income, capital and assets. Empirical research conducted in Argentina showed that financial resources, investment in new technology and market diversification are the most important indicators of company growth (Hermelo and Vassolo, 2007). Most studies find a weak negative relationship between the firm size and expected growth rate, even after considering a number of control variables, the most prominent of which are the probability of survival in the sample, the activity the firm engages in, and the least efficient firm size in that industry. Some studies conclude that there is not enough statistical evidence to reject the so-called Gibrat's law, according to which the company size and the expected rate of its growth are statistically

independent. Prior to conclusion, such surveys usually make the necessary corrections for measurement error problems. By applying autocorrelation and heteroscedasticity, the growth rate of the enterprise in the sample is modified, which can all affect the outcome of the assessment of the relationship between the size of the enterprise and its expected growth rate. (Coad, 2009).

4. CONCLUSIONS

The company growth almost always changes the nature of the management problems that the company faces, as well as the knowledge and skills necessary for the company to deal with the problems that arise. The research methodology was based on calculating the coefficient for each company in order to obtain the arithmetic mean, and median and quartile to obtain the relevant indicators. As econometric stochastic models have little value for predicting or explaining the growth process at the level of individual firms, the central subject of interest is understanding the growth process at the level of the individual firm. Empirical data indicate a very asymmetric size distribution of enterprises, with a small number of large enterprises and a large number of smaller enterprises. This distribution of the firm size can be explained by stochastic processes in which variable firm sizes are observed, and the result of cumulative random shocks (earthquakes) over time. The distribution of a company by size is the result of random processes.

The results of the research can be summarized as follows:

- The highest average rate and the highest median share of capital in the total liabilities of the company are recorded by the companies from the catering industry, followed by finance and insurance, while the companies in the field of education and agriculture, forestry and fishing have the lowest average participation rate, and the companies in the field of transport and storage have the lowest median.
- The total median growth rate for all companies is 4.77%, with companies from the second group having the highest growth rate. The highest growth rate of the median share in capital in total liabilities is recorded by enterprises from the activities of providing accommodation, food preparation and serving, hotel industry, while the highest rate of median share of capital in liabilities of the company is recorded by the companies engaged in mining and quarrying. The median is a better measure of showing a sustainable growth rate relative to the arithmetic mean. The arithmetic mean is influenced by extreme data, which means that the third quartile is smaller than the arithmetic mean.

– When we compare the median optimal growth rates with the medians of growth of income, capital and assets, we see that companies from the first group of companies measured by these indicators grow several times faster than optimal, as the size of companies increases, so the difference between these indicators and optimal growth rates is lower, although for all groups of medians the sustainable growth rates are lower than the median growth rates of income, capital and assets. On average, companies meet the requirement of the total amount of capital which is above 33%. When we look at the groups of companies, we can conclude that the largest share of capital in the sources of financing belongs to the companies from group III, that is, the companies that have over 5 million capital.

It can be concluded that numerous factors can affect the growth of a company, but that the influence of individual factors on the growth of a company is rarely significant and permanent.

REFERENCES

Chen, H.Y., Gupta, M.C., Lee, A.C., & Lee, C.F. (2013). Sustain- able growth rate, optimal growth rate, and optimal payout ratio: A joint optimization approach. *Journal of Banking & Finance, 37*(4), 1205-1222.

Coad Alex (2007). *Firm growth: A survey*. Jena, Germany: Max Planck Institute of Economics.

Coad, A. (2009). *The Growth of Firms: A Survey of Theories and Empirical Evidence.* Cheltenham, UK: Edward Elgar.

Gibrat, R. (1931). *Les inégalités économiques*. Paris, France: Librairie du Recueil Sirey.

Gruenwald, R.K. (2015). *Measuring growth of the firm: Theoretical considerations*. Cracow, Poland: Cracow University of Economics.

Harmelo, F.D. & Vassolo, R.(2007). The determinants of firm's growth: an empirical examination, *Revista ABANTE*, *10*(1), 3-20.

Hassan, R. S. & Hart, M. (2016). The determinants of small firm growth: An empirical study on Egypt. *The Business & Management Review*, *7*(2), 41-52.

Isaković, S. (2015). *Menadžment malih i srednjih preduzeća*. Zenica, Bih: Ekonomski fakultet Univerziteta u Zenici.

Kouser, R., Bano, T., Azeem, M. & Hassan, M. (2012). Inter-relationship between profitability, growth and size: A case of non-financial companies from Pakistan, *Pak. J.Commer.Soc.SCI, 6*(2), 405-419.

Lehtoranta, O. (2010.). Innovation, Collaboration in Innovation and the Growth Performance of Finnish Firms. *VTT Publications 729,* 17-76.

Levratto, N., Tessier, L. & Zouikri, M. (2010). The determinants of growth for SME. A longitudinal study from French manufacturing firms. *SSRN Electronic Journal*, *28*.

Loi, T. H. & Khan, A. A. (2012). *Determinants of firm growth: evidence from Belgian companies*. Belgium Gent: Universiteit Gent Faculteit economie en bedrijfskunde.

Stowe, J. (2000). *Analysis of Equity Investments.* Boston: AIMR. Pearson Custom Publishin.

Tarfasa, S., Ferede, T., Kebede, S. & Behailu, D. (2016). *Determinants of growth of micro and small enterprises (MSEs): Empirical evidence from Ethiopia.* Swiss Programme for Research on Global Issues for Development.

Voulgaris, F., Asterius, D. & Agiomirgianakis, G. (2003). The determinants of small firm growth in the Greek manufacturing sector. *Journal of Economic Integration 18*(4), 817-836.

Vučenović, S. (2017). *Upravljanje investicionim projektima.* Banja Luka, BiH: Ekonomski fakultet Univerziteta u Banjoj Luci.

Wichkam, A. P. (2006). *Strategic Entrepreneurship, 4th Ed.* New Jersey; USA: Prentice Hall

УПРАВЉАЊЕ РАСТОМ ПРЕДУЗЕЋА У РЕПУБЛИЦИ СРПСКОЈ

[1] Саша Вученовић, Економски факултет Универзитета у Бањој Луци, Босна и Хереговина
[2] Бранка Золак Пољашевић Економски факултет Универзитета у Бањој Луци, Босна и Хереговина
[3] Игор Мишић, Економски факултет Универзитета у Бањој Луци, Босна и Хереговина

САЖЕТАК

Методологија истраживања полази од рачунања коефицијента за свако појединачно предузеће како би се израчунавањем аритметичке средине, медијане и квартила добили збрини показатељи. Како економетријски стохастички модели имају малу вриједност за предвиђање или објашњење процеса раста на нивоу појединачних предузећа, централни предмет интересовања је разумијевање процеса раста на нивоу појединачног предузећа. Одржива стопа раста предузећа зависи од дјелатности предузећа. Бројни фактори могу утицати на раст предузећа, али је утицај појединачних фактора на раст предузећа ријетко значајан и постојан. Резултати проведеног истраживања указују на веома асиметричну дистрибуцију величине предузећа, са малим бројем великих предузећа и великим бројем мањих предузећа. Модел одрживог раста представља ефикасно средство за финансијско планирање и усмјеравање пословне политике ка стимулацији раста у појединим привредним гранама.

Кључне ријечи: *управљање, раст предузећа, одржива стопа раста, мјерење раста.*

Прегледни научни чланци
Review Scientific Papers

THE STRATEGY OF INCREASING PRODUCTION COMPETITIVENESS IN FOOD INDUSTRY OF THE REPUBLIC OF SRPSKA BY STIMULATING A NEW PRODUCT DEVELOPMENT

1 Slavica Grujić, University of Banja Luka, Faculty of Technology,
Banja Luka, Bosnia and Herzegovina
2 Mirjana Grujčić, University of Banja Luka, Faculty of Technology,
Banja Luka, Bosnia and Herzegovina
*Corresponding author E-mail: slavica.grujic@tf.unibl.org
1 ORCID ID: 0000-0002-7176-3449

ARTICLE INFO

Review Scientific Paper
Received: 14.09.2020.
Revised: 12.10.2020.
Accepted: 13.10.2020.

doi 10.7251/ACE2134067G
UDC
633.1-153.041:664.11(497.6RS)

Keywords: *food industry, production competitiveness, new product development, healthy diet*

JEL Classification: O10, O32, D12

ABSTRACT

Food processing enterprises could ensure production competitiveness by improving product quality and harmonising it with consumer requirements. The non-communicable diet-related diseases have been increasing rapidly among consumers in the last decade as well as the impact on people's attitudes towards nutritional aspect of the quality of food products and healthier diet. The aim of this paper is to illustrate the methodology for increasing production competitiveness in food industry of the Republic of Srpska, based on consumer-oriented food product development and healthy diet. The structured questionnaire and scientific methods were used in young consumer representatives' research regarding food product development in the target market. Exactly 720 participants were recruited from public educational institutions in the Republic of Srpska. The descriptive statistics and correlation were used for the data analysis. The results indicated positive statistically significant correlation coefficients ($p<0.05$) between consumer interest in new products and: healthy diet preferences; product ingredients; product higher nutritive value (vitamins, minerals, dietary fibres content); fruit, fruit juice and low-energy beverages consumption. Also, knowledge on diet-related diseases was in significant positive correlation with them. The data analysis revealed that an increase in production competitiveness could be assessed through developing food products based on nutritive elements, modelling and consumer interest in new food products with higher nutritive quality.

1. INTRODUCTION

Modern consumer has the opportunity to choose from a wide range of available food products, but it sometime results in overconsumption and other unhealthy eating habits, derived from lack of interest in healthy life. At the same time, market development and growth bring many new opportunities for companies in the field of product innovation, with expected increase in productivity and competitiveness. Innovations are the product of integrated cooperation between qualified entrepreneurs and employees with suppliers and customers (Soegoto & Walewangko, 2019; Voinea et al., 2019).

The food industry is one of the important sectors of the economy of the Republic of Srpska, which can build its strategy on better use of available production capacities and technological resources, through increasing the volume of production and their own development of food products with higher added value, by substituting products from import with domestic or by increasing export. Priorities and strategic goals of industry development should be defined by the development strategy, based on the analysis of real situation and possibilities for increasing the production competitiveness (Vlada Republike Srpske, 2018). The food industry could increase productivity and assess strategic position if it carefully analyses its own needs and financial, intellectual or personal capabilities for investment in new products or processes innovation, with enough flexibility for product markets and customers (Stewart-Knox et al., 2013; Grujić et al., 2013a,b; Lehman et al., 2019; Soegoto & Walewangko, 2019).

The occurrence of non-communicable diet-related diseases has been increasing rapidly among consumers in the last decade as well as the impact on people's attitudes towards the nutritional aspect of the food quality and healthier diet. Contemporary recommendations for nutrition are based on current available scientific evidence and policy-related documents such as national dietary guidelines or food standards regulations. Responsible international and national institutions focus activities on improving health of all people, present and future generations. The emphasis is on innovative and evidence-informed policy and practice, with identified priority areas, which include food quality and supporting healthier diet. Specific guidelines are developed based on the recommendations and they are used for nutrition and health policy created at the international level (Mu et al., 2017; WHO-EU, 2018; Neale & Tapsell, 2019). The recommended form of novelty in nutrition opens new perspectives for the food industry, to use available scientific data for transforming and harmonizing food products composition and content of nutrients with health benefits.

Furthermore, consumers' attitudes towards food are related to satisfying hunger, providing necessary nutrients for the body, improving physical and mental well-being, as well as preventing diet-related diseases. Dietary patterns and lifestyle are very important during childhood and adolescence for growth and development of adults. Adolescence and youth population lifestyles are characterized by a period when individuals define their identities through different associations and consumption practices (Mason et al., 2011; Davison et al., 2015; Richard et al., 2015; Steinhauser et al., 2019). Their behaviour and opinions, as consumers of the future, are complex, but must be analysed and included into marketing research and policy development. It is known that unhealthy eating habits include high intake of sodium, red meat, fats and sugar, and at the same time low intake of healthy foods, such as fruit, vegetables, whole grains, nuts and seeds. Therefore, lifestyle habits often lead to the occurrence of non-communicable diet-related diseases and increase in healthcare costs, and they were identified and reported as problems in previous and modern studies of consumers (WHO-EU, 2018; Mu et al., 2017; Annunziata et al., 2019; Voinea et al., 2019).

Hypotheses and their relation with research design

The aim of this paper is to illustrate the methodology for increasing production competitiveness in food industry of the Republic of Srpska, based on consumer-oriented food product development and healthy diet.

Literature has shown that success of new food products depends on the quality of development strategy, as well as on flexibility in organization and realization of all activities. Also, communication with consumers must be included and different tests could be used for collecting data regarding importance of quality characteristics of new food products (Grujić & Grujčić, 2016; 2017; Grujić & Odžaković, 2017). Information placed on product labels are important for identification of food product and its quality characteristics. They allow consumers to compare available packed products and search for some new, depending on life style, individual preferences for food products or their ingredients. Literature also revealed that the preference for healthy diet could be related to frequent consumption of fresh fruit, fruit juices and some *light* products (Stewart-Knox et al., 2013; Grujić & Grujčić, 2016; 2017; WHO-EU, 2018; Soegoto & Walewangko, 2019). Informed consumer expresses interest in food products enriched with selected nutrients and proven health benefits. The inadequate nutrition can affect health, and individual health status can impact diet and consumer purchase intentions (Annunziata et al., 2019 Steinhauser et al., 2019).

Considering all mentioned, planed research with consumers in the target market included the analysis of their perception and relationship between variable

specific for a new food product development, and consumer interest in the selected parameters of food quality and healthy diet indicated in selected questions (marked with Qx symbols). Therefore, five main and six additional hypotheses have been formulated, focusing on the fields of interest for the research, as shown in the following text.

There is a relationship between consumer preference for new food products (Q1) and:

H1: interest in product composition available on labels (Q2);

H2: habit to compare labelled quality data of similar food products before chosing (Q3);

H3: preference for healthy diet (Q4); $H3_a$: their intention to consume fresh fruit every day (Q5); $H3_b$: to consume fruit juice (Q6); $H3_c$: to consume light products and beverages produced without added sugar (Q7); $H3_d$: intention to buy food products enriched with vitamins and minerals (Q8); $H3_e$: enriched with dietary fibres (Q9);

H4: intention to consume food products with improved nutritive content, even if they have diminished sensory quality (Q10);

H5: knowledge that inadequate nutrition can affect health (Q11); $H5_a$: individual health status impact diet (Q12).

A simple correlation analysis could be applied to examine whether there is a quantitative agreement between the variations of the observed phenomena and if any, the Pearson Correlation Coefficient (r) is used to measure the intensity of the relationship between the observed variables (Lovrić et al., 2006, p. 353). The planned research should enable identification of consumers' habits and preferences regarding food quality and nutrition, as useful parameters of new food products and increasing production competitiveness in the target market.

2. MATERIALS AND METHODS

2.1. Research Design

A scientific approach was used to collect and analyse data with aim to illustrate the methodology for developing new products and increasing production competitiveness in the food industry of the Republic of Srpska. Data related to the consumers' preferences for food quality, its ingredients and nutrition could be useful elements for development of new products with higher nutritive quality, based on a healthy diet.

2.2. Methodology

Characteristics of participants

The target market could be a source of innovative ideas and opportunity for development. The research was conducted with 720 individuals (16-25 years old), from public secondary and higher educational institutions in 5 towns (Banja Luka, Prijedor, Bjeljina, Zvornik, Istočno Sarajevo) in Republic of Srpska (Bosnia and Herzegovina) as the target market (Table 1). They were recruited based on individual interest in participation in the research.

Table 1. Demographic characteristics of respondents (N=720)

Demographic variable	Options	Average age ±SD*	Frequency (n)	Frequency (%)
Gender	Female	19.5±2.73	430	59.7
	Male	18.5±2.80	290	40.3
Female age	under 18	16.5±0.58	147	34.2
	18-20	19.4±0.87	94	21.9
	older than 21	22.0±1.63	189	43.9
Male age	under 18	16.4±0.67	155	53.4
	18-20	19.0±0.98	55	19.0
	older than 21	22.5±1.62	80	27.6

*SD- standard deviation
Source: Prepared by authors based on research data.

Young adults are identified as the target group of consumers with formed individual eating habits, and potential users of new food products in future time. The printed questionnaires, used as a research tool, were distributed in educational institutions for direct self-reporting data interesting for the investigation. The research questionnaires had two sections. The first contained questions about respondents' demographic variables, such as gender, age and education level, while the main research data, regarding food product quality and preferences, were in the second section.

Respondents were classified based on gender (male and female) and age, without possibility for changes. Data were analysed regarding the total observed young population and representatives of female and male consumers. The descriptive statistics included means and standard deviations (SD) of average age, frequencies (n; %) within each group of respondents (Table 1). Some data are missing in one questionnaire, so they were omitted in one part of the correlation analysis.

Procedure and questionnaire design

In order to determine whether there is consumer interest in new food products in the target market, a questionnaire was developed based on the literature review, with precisely formulated questions related to consumer's individual behaviour at the time of purchase.

The questionnaire was used to obtain consumers' personal data and answers (Yes/No) to 12 questions grouped based on the stated hypotheses and similarities, as follows: consumer preference for new food products (Q1) and interest in product composition as labelled data (Q2) and their use in food choice (Q3); preference for healthy diet (Q4) and specific food (Q5-7); individual knowledge on nutrition and health relationship (Q8-12), as shown in Table 2. The respondents took about 10 minutes to complete the questionnaire.

Table 2. Questions related to consumer interest in food products and healthy diet

Question (Qx)	Yes/No Questions
Q1	Do you like tasting new food products?
Q2	Do you read labelled information about ingredients used for product manufacturing?
Q3	When choosing between similar food products, do you compare labelled data?
Q4	Do you like healthy diet?
Q5	Do you eat fruit every day?
Q6	Do you like drinking fruit juice (*apple, orange, cherry, etc.*)?
Q7	Do you like drinking *light* products and beverages produced without sugar?
Q8	Do you purchase products enriched with vitamins and minerals?
Q9	Do you purchase products enriched with dietary fibres (*integral cookie*)?
Q10	Would you like to buy a product that is not particularly attractive, but has improved nutritive content?
Q11	Can inadequate nutrition affect health?
Q12	Do you need a special diet because of health problems?

Source: Authors

Data analysis

The results of the research were grouped and analysed using descriptive statistics and correlation tests (Pearson's correlation coefficient r) with the aim to test the relationship between variables, the respondents' attitudes towards certain terms included in questions. The research could be characterized as quantitative. All analyses were performed using Statistical software *3BStat* Gold Edition, Version 1.01 (Lovrić et al., 2006). Statistically significant values were considered those of p below 0.05.

3. RESULTS AND DISCUSSIONS

Companies need a relatively large market, acceptable product quality, customers and a supportive network for sustainable development, also to be able to use all resources in a satisfactory way, to have professional organization and motivation to succeed. The target market should be the source of information for innovative ideas and opportunity for development (Norrman & Bager-Sjögren, 2010; Grujić & Grujčić, 2016; 2017). Economic success in a competitive environment is possible if the product quality is improved by modifying food formulations or processing to satisfy identified consumers' requirements and preferences. Sometimes innovation can be relatively inexpensive and it could be achieved without the need to purchase new technological equipment, when knowledge and experience are used (Grujić, S. & Grujić, R., 2012; Rabidas & Bowen, 2019).

Target market and product category interesting for consumers were defined at the beginning of the planned research. Producer's ability to identify and transform consumers' expectations of the product quality characteristics are important for consumer-oriented product development, considering that nature of modern purchasing intentions is changing together with lifestyle. This would be more difficult part of the work, as consumers do not directly say what kind of product or its quality they expect. That is why consumer interest in new food products and healthy nutrition were investigated using precisely formulated questions, related to their individual behaviour and food preferences, as a tool. The research data could confirm or reject the idea of specified category of new food product development. So, the survey of consumers' habits was conducted in the target market of the Republic of Srpska and summary of analysed *Yes* answers to questions was given, distributed between respondents grouped based on gender, and shown in Table 3.

Comparison based on percentages of Yes answers to specified questions, for all respondents included in the research (N=719), revealed that majority of participants (more than 80%) possessed knowledge that inadequate nutrition affects health (Q11), showed interest in healthy diet (Q4), preference to taste new food products (Q1) and to purchase products enriched with vitamins and minerals (Q8). Less interest, in descending order (Table 3), were revealed for reading labelled information regarding ingredients of packed food products, but just about half of respondents compare them with other similar products (Q2-3). The consumers' preference for healthy diet and food products selected as indicators of healthy eating were acceptable (50-80% affirmative answers), as respondents expressed intention to consume fruit juice (Q6), fresh fruit every day (Q5) and food products with improved nutritive content, even if they have diminished

sensory quality (Q10). Interest in food products enriched with dietary fibres (Q9) and light products and beverages produced without added sugar (Q7) was confirmed by ~50% of respondents. The need to improve the quality of nutrition of modern consumers of the future was taken into account, when the research plan was made. Finding that individual health status impact diet (Q12) of almost 20% of respondents included in the research, deeper investigation and identification of its reasons are necessary in near future. Also, some differences in answers of groups based on consumers' gender were revealed (Table 3). Identification of consumers' choice criteria used during evaluation and selection of the best available food products, were a tool for collecting ideas or interesting food attributes of new or renewed food product modelling.

Producer should use all available knowledge, resources, row materials and processing methods, within the legally prescribed framework, in order to offer food product with new, higher and expected level of quality, compared to the available classic. It could be said that it is indirect modelling of product attributes, using ingredients for food product with selected quality characteristics, in accordance with the nutrient based recommendations. Then success can be expected in the form of increased productivity and competitiveness.

Table 3. Summary of analysed *Yes* answers to questions for all respondents (N=719) and respondents grouped based on gender (n_M=290 Male, n_F =429 Female)

Question (Q_x)	*Yes* answers All respondents (N=719)		*Yes* answers Male (N=290)		*Yes* answers Female (N=429)	
	n_{Qx} [a]	% [b]	n_{MQx} [a]	% [b]	n_{FQx} [a]	% [b]
Q1	597	83.03	233	80.34	364	84.85
Q2	521	72.46	191	65.86	330	76.92
Q3	296	41.17	136	46.90	160	37.30
Q4	617	85.81	251	86.55	366	85.31
Q5	480	66.76	199	68.62	281	65.50
Q6	485	67.45	190	65.52	295	68.76
Q7	351	48.82	144	49.66	207	48.25
Q8	588	81.78	229	78.97	359	83.68
Q9	362	50.35	116	40.00	246	57.34
Q10	444	61.75	166	57.24	278	64.80
Q11	689	95.83	273	94.14	416	96.97
Q12	137	19.05	56	19.31	81	18.88

[a] Number of *Yes* answers (n_{Qx}) to each individual question (x = 1–12).
[b] % of *Yes* answers to each individual question (x = 1–12) calculated based on possible number of *Yes* answers.

Source: Authors' calculation based on research data

3.1. Consumer interest in a new food product

Growing incidences of health-related diseases indicated the need to prevent them, especially among younger consumers. The analysis of the real situation in the target market and the possibility for an increase in the production competitiveness, should start with the identification of consumers' preferences for selected food products and their ingredients, related to the healthy diet.

Food products should offer positive nutritional characteristics or health benefit regarding contained nutrients, to attract modern consumers' attention (Grujić & Grujčić, 2016; 2017; Annunziata et al., 2019; Steinhauser et al., 2019). That is the reason why the frequency of positive answers to selected questions was analysed and correlated, while each statement was treated as variable. In order to investigate the existence of correlation between independent variable specified for the new food product development in the target market (x) and the consumer interest in selected parameters of food quality and healthy diet, as dependent variable (y), Pearson's correlation coefficient (r) was calculated and formulated hypotheses were tested (Table 4).

Among contributing factors of obesity development, specific lifestyle and consumption of energy-rich food products could be singled out as important (Hotchkiss & Trius, 2016; Mu et al., 2017). Dietary Reference Values is the term used in nutrition that indicates complete set of nutrient reference values for the amount of nutrient, which must be consumed on a regular basis, to maintain health of an individual (or population). They provide the scientific bases on which nutrition recommendations are built, used in diet assessment and diet planning, for the population or at the individual level. They also serve as the basis for setting reference values in food products labelling and establishing food based dietary guidelines (European Food Safety Authority - EFSA, 2017; Voinea et al., 2019).

Food industry could identify opportunities for consumer-oriented food product development in recommended forms of nutrition. Also, respondents' intentions to look for a new food product and buy it, if it satisfies their individual expectations, should be investigated. An experiment was designed with the intention to collect relevant data from the target market.

3.2. Consumer interest in new food product composition

Food label on packed food products offer different information regarding quality, used ingredients, nutritive composition and fortification with vitamins, minerals and dietary fibres, as well as other useful data (Stewart-Knox et al., 2013; Grujić & Grujčić, 2016; 2017; Annunziata et al., 2019). The correlation between the

answers should indicate the interrelation of certain terms covered by the questions, as respondents' attitudes towards them. First part of the research tested hypotheses (H1) and results suggested that the level of correlation between consumers' preference for new food products (Q1) as dependent variables and the use of labelled information about food product ingredients (Q2) were highly positive and statistically significant (r=0.9182), the same as the consumers' habits to compare labelled quality data between similar products, before choosing food (Q3) (r=0.817), where hypotheses H2 was tested, as an additional indicator of respondents' interest in product composition. Results are shown in Table 4.

Our results indicated high interest in information labelled on food, also suggesting that consumers pay attention to information labelled on new products (Table 3), the findings similar to the results of other research (Grujić et al., 2013a,b; Hung et al., 2019; Rabidas & Bowen, 2019).

Obtained results suggesting that correlation between consumers' preference for new food products (Q1) and interest in product composition were positive and significantly high ($p<0.01$), supported hypotheses H1 and H2, and also confirmed the possibility for development of new food products, based on modeling the quantity and types of ingredients to achieve higher, added value, as a way of increasing production competitiveness in food industry.

3.3. Consumer interest in a new food product and healthy diet

Quality characteristics of the selected product should be the key elements in consumer-oriented food product modelling and preparing for the target market supply. The recommendations for a healthy diet are based on intake of individual nutrients, covering water, fats, carbohydrates and dietary fibre, protein, energy, 14 vitamins and 15 minerals, which are translated simply into food based recommendations intended for the whole population. The nutrient based dietary advice indicates different foods, categories of food and their products contribution in an overall diet that help consumers to maintain good health through optimal nutrition (Bruschi et al., 2015; Davison et al., 2015; EFSA, 2017; Lehman et al., 2019).

Existence of relationship between consumers' preference for new food products (Q1) and preference for healthy diet (Q4) tested hypothesis H3, and results indicated very high statistically significant positive correlation (r=0.945, $p<0.01$) (Table 4).

Table 4. The correlation coefficient (r) and significance of relationship between selected variables (number of *Yes* answers to individual questions for all respondents, N=719)

Tested hypothesis	Questions (Q_x) used as dependent variable	Questions (Q_x) used as independent variable and correlation coefficient (r)			
		Q1	Q10	Q11	Q12
H1	Q2	0.9182**	0.9707**	0.9745**	0.5881*
H2	Q3	0.8170**	0.7341**	0.8552**	0.6764*
H3	Q4	0.9450**	0.9378**	0.9922**	0.6925*
$H3_a$	Q5	0.9541**	0.8544**	0.9510**	0.8111**
$H3_b$	Q6	0.9701**	0.9121**	0.9802**	0.7747**
$H3_c$	Q7	0.9326**	0.7242**	0.8645**	0.8862**
$H3_d$	Q8	0.9761**	0.9155**	0.9907**	0.7377**
$H3_e$	Q9	0.8189**	0.9395**	0.8788**	0.4546
H4	Q10	0.8518**			
H5	Q11	0.9614**			
$H5_a$	Q12	0.8278**			

Statistically significant correlation: * $p < 0.05$, **$p<0.01$
Source: Authors' calculation based on research data

The food product's quality parameters are related to the the type of ingredients and processing methods. Also, nutrition knowledge and personal health motivation positively influence food products purchase decision (Grujić & Grujčić, 2016; 2017; Neale and Tapsell, 2019; Steinhauser et al., 2019). Consumers' preferences for some products, recommended for healthy diet were investigated using additional hypothesis $H3_{a-e}$ and revealed very high significant positive correlation ($p<0.01$) between consumers' preferences for new food products (Q1) as independent variables and: ($H3_a$) their intention to consume fresh fruit every day (Q5) (r=0.9541), ($H3_b$) fruit juice (Q6) (r=0.9701); ($H3_c$) *light* products and beverages produced without added sugar (Q7) (r=0.9326); ($H3_d$) intention to buy, and interest in food products enriched with vitamins and minerals (Q8) (r=0.9761), the same as ($H3_e$) for enriched with dietary fibres (Q9) (r=0.8189), as presented in Table 4.

Food product with adequate nutritive, functional and technological quality, have little chance to succeed in the market without acceptable sensory quality (Munoz, 2002; Grujić, S. & Grujić, R., 2012). It is known that nutritive content improving sometimes diminish product sensory quality, but some consumers tolerate it and purchase the food, to satisfy individual nutritive needs (Stewart-Knox et al., 2013; Voinea et al., 2019). Also, different modern methods could draw consum-

ers' attention to new healthy food products, and change their habits or negative relationship between healthiness and tastiness (Hung et al., 2019)

Tested Hypothesis H4 indicated high statistically significant positive correlation ($p<0.01$) between consumers' preference for new food products (Q1) and intention to consume food products with improved nutritive content (Q10), even if they have diminished sensory quality ($r=0.8518$) (Table 4). The results provide evidence to support hypothesis H3 and $H3_{a-e}$, and identified consumers' preferences represent useful information for innovative ideas and base for consumer-oriented healthy food product development and increasing production competitiveness in food industry of the Republic of Srpska.

3.4. Consumer interest in new food products, nutrition and health relationship

The consumers' behaviour based on unhealthy diets is usually connected with excessive consumption of energy, saturated fat, sugar and salt. On the other side, nutrient intake recommendations are opening new perspectives for the food industry to introduce novelty in product range and technical aspect of controlled food product nutritive value (Beauge, 2012; Stewart-Knox et al., 2013; Neale & Tapsell, 2019). Based on mentioned opposite statements regarding eating habits, presented research also aimed to determine consumers' knowledge about nutrition and health relationship and individual health status, as a part of planned new food product composition modelling. That is why hypothesis H5 was tested and revealed very high statistically significant positive correlation ($p<0.01$) between consumers' preference for new food products (Q1) as independent variables and (Q11) knowledge that inadequate nutrition can affect health ($r=0.9614$); the same as with (Q12) individual health status impact on diet ($r=0.8278$), tested with additional hypotheses $H5_a$ (Table 4).

The objective of the presented research determined relationship between the use of symbols of food quality and their possible impact on new product purchasing and consumption, taking into account respondents' individual differences in available data and food preferences. Results confirmed that consumers usually compare available products quality characteristics, to make the best choice in the light of their preferences regarding better nutrition. On the other side, each producer should identify the quality characteristics and use them for a new product development, especially if it is prepared in line with nutrient based recommendations for a healthy diet.

3.5. Consumer interest in food product quality and healthy diet

Consumers have formed personal values related to sensory quality characteristics, the nature of food, and special concerns about the influence of food they eat on their health (Steinhauser et al., 2019). New food product success and competitiveness depend on its quality achieved through transforming identified customers' preferences or requirements into the product design, costs of development and production (Grujić, S. & Grujić, R., 2012; Neale & Tapsell, 2019). Methodology for identifying habits and consumer preferences in the target market, presented in this paper, could be a useful model for a new product development or improvement of quality of the existing food product based on satisfying consumer requirements.

Food nutritive fortification is considered as the most appropriate preventive approach against diseases (Annunziata et al., 2019; Steinhauser et al., 2019). The improvements of consumers' nutrition require engagement and action in different fields and food producers may contribute by improving the structure, quality availability and attractiveness of domestic food products from their range. Quality characteristics of a new product should offer some important benefits to consumers, compared to other available products. That is why they were asked carefully selected questions. It is necessary to point out the worrying fact that a relatively large number of respondents included in the research (Table 3) confirmed the individual need for a special diet because of health problems (Q12), and because of that, it was used as independent variables in correlation analysis.

Additional correlation analyses were done to support innovation-oriented activities in the field of research. Recommended balanced and varied diet should include enough vegetables, fruits and whole grains, but at the same time, food should be nutritious and tasty. Affirmative answers to selected questions, regarding consumer interest in food products that have improved nutritive content, even if they have diminished attractiveness and sensory quality (Q10); presented knowledge regarding nutrition and health interconnection (Q11); and individual health status impact on diet (Q12), were used as independent variables in additional analysis to examine the existence of their possible relationship with consumer interest in certain products that healthy diet recommends, as well as the Pearson Correlation Coefficient (r) to measure the intensity of the relationship between the observed variables (Table 4).

Individual interest in information and food product characteristics embedded in the questions were identified for the observed population (N=719 respondents), using affirmative answers. Consumers' intention to buy some food product with improved nutritive content, regardless of its particular attractiveness (Q10) (Ta-

ble 3) had high statistically significant positive correlation ($p<0.01$) with selected representative parameters, included in offered questions: individual interest in labelled information (Q2); comparing labelled information before choosing the best product (Q3); preference for healthy diet (Q4); intention to consume fresh fruit every day (Q5), fruit juice (Q6) and light products and beverages produced without added sugar (Q7); interest in food products enriched with vitamins and minerals (Q8) and dietary fibres (Q9) (Table 4). The analysis revealed different aspects of consumers' attitudes towards the nutritive quality of a food product and indicated that criteria for healthy food choice were positively related to the healthy food habits.

Similar results and a high statistically significant positive correlation showed the analysis of the relationship between previously mentioned dependent variables, the indicators of healthy food choice, and knowledge about inadequate nutrition that affects health (Q11), used as independent variable, the same as when correlated with independent variable (Q12*)* which indicated the need for special diet because of health problems, except for (Q9) interest in food products enriched with dietary fibres ($r=0.4546$, $p>0.05$). Results are presented in Table 4.

The consumers' nutrition knowledge and health motivation have impact on the attention paid to nutritive quality of a food product during the purchase (Bruschi et al., 2015; Steinhauser et al., 2019; Voinea et al., 2019). Introducing controlled nutrient profile as a technical aspect of innovations in food production, as well as changing its composition in the direction towards recommended healthy products could impact consumers' eating preferences (Grujić et al., 2013a,b; Davison et al., 2015; Lehman et al., 2019).

4. CONCLUSIONS

According to the defined aim, this paper illustrated the methodology for increasing production competitiveness in food industry of the Republic of Srpska, based on the consumer-oriented food product development and healthy diet.

The results of the research provide information, important and useful for the food industry, about consumers' preferences and perception of food products. Selected factors, positively correlated with new product purchasing intention and consumers' choice of healthy food, are identified. Promising and important are findings that majority of respondents, included in the research, read and use data indicated on food labels and consider data regarding food composition and nutritive value, in an effort to improve personal nutritional status.

Based on the results, it could be concluded that increasing production competitiveness in the food industry of the Republic of Srpska could be assessed by developing food products which have quality harmonised with recommendations for healthy nutrition, based on nutritive element modelling and produced for consumers interested in the new food products with higher nutritive quality. Identified consumer interest in the quality of individual nutrition is opening new perspectives for improving the structure of domestic products offered in the market. Also, the results confirmed that target market could be used as a source of information for innovative ideas and opportunity for development.

REFERENCES

Annunziata A. & Mariani A. (2019). Do Consumers Care about Nutrition and Health Claims? Some Evidence from Italy. *Nutrients*, *11*(11), 2735. doi:10.3390/nu11112735.

Bruschi, V., Teuber, R. & Dolgopolova, I. (2015). Acceptance and willingness to pay for health-enhancing bakery products – Empirical evidence for young urban Russian consumers. *Food Quality and Preference, 46*, 79–91. doi:10.1016/j.foodqual.2015.07.008.

Davison, J., Share, M., Hennessy, M., Bunting, B., Markovina, J. & Stewart-Knox, B. (2015). Correlates of food choice in unemployed young people: The role of demographic factors, self-efficacy, food involvement, food poverty and physical activity. *Food Quality and Preference, 46*, 40–47. doi:10.1016/j.foodqual.2015.06.014.

EFSA (European Food Safety Authority). (2017). *Dietary Reference Values for nutrients. Summary Report. EFSA supporting publication 2017*:e15121. 98pp. Amended 23.09.2019. doi:10.2903/sp.efsa.2017.e15121.

Grujić, S. & Grujić, R. (2012). Food product development as opportunity for success or survival in the market. In *6th Central European Congress on Food. CEFood 2012* (pp. 1202-1206). Novi Sad, Serbia. doi: 10.13140/2.1.2352.7206.

Grujić, S., Grujić, R., Petrović, Đ. & Gajić, J. (2013a). Knowledge of food quality and additives and its impact on food preference. *Acta Sci.Pol., Technol. Aliment*. *12*(2), 215-222. Retrieved from: https://www.food.actapol.net/pub/10_2_2013.pdf.

Grujić, S., Grujić, R., Petrović, Đ. & Gajić, J. (2013b). The Importance of Consumers' Knowledge About Food Quality, Labeling and Safety in Food Choice. *Journal of Food Research, 2*(5), 57-65. Retrieved from: http://10.5539/jfr.v2n4p57.

Grujić, S. & Grujčić, M. (2016). Consumer's research for new functional bakery product development. *Applied Technologies and Innovations*, *12*(1), 1-16. Retrieved from: http://dx.doi.org/10.15208/ati.2016.01

Grujić, S. & Grujčić, M. (2017). Identification of products attributes important for food choice. *Agro FOOD Industry Hi Tech, 28*(6), 67-72. Retrieved from: http://www.teknoscienze.com/tks_article/identification-of-products-attributes-important-for-food-choice/

Grujić, S. & Odžaković, B. (2017). Ishrana gojaznih osoba i proizvodnja hrane za smanjenje tjelesne mase - izazov za prehrambenu industriju. *In Proceeding of V International Congress Engineering, Environment and Materials in Processing Industry* (pp. 1617-1637). Jahorina, Bosnia and Herzegovina. doi: 10.7251/EEMSR15011617G.

Hotchkiss, S. & Trius A. (2016). Food: Free From Functional Food Fibres and their use in healthier fat reduced formulations. *Agro FOOD Industry Hi Tech., 27*(2), 26-29.

Hung Y, Hieke, S, Grunert, K. G. & Verbeke W. (2019). Setting Policy Priorities for Front-of-Pack Health Claims and Symbols in the European Union: Expert Consensus Built by Using a Delphi Method. *Nutrients*, *11*(2), 403. doi:10.3390/nu11020403.

Lehman, T. A., Krug, J. & Falaster, C. D. (2019). Consumer purchase decision: factors that influence impulsive purchasing. *Brazilian Journal of Marketing, 18*(4), 196-219. doi: 10.5585/remark.v18i4.13345.

Lovrić, M., Komić, J. & Stević, S. (2006). *Statistička analiza: Metodi i primjena*, Banja Luka, Bosna i Hercegovina : Ekonomski fakultet Univerziteta u Banjoj Luci.

Mason, M. J., Tanner, J. F., Piacentini, M., Freeman, D., Anastasia, T., Batat, W., Boland, W., Canbulut, M., Drenten, J., Hamby, A., Rangan, P. & Yang, Z. (2011). Youth and Risky Consumption: Moving Toward a Transformative Approach. *Journal of Research for Consumers*, *19*, 1-6.

Mu, M., Xu, L.F., Hu, D., Wu, J., & Bai, M.J. (2017). Dietary Patterns and Overweight/Obesity: A Review Article. *Iran J Public Health, 46*(7), 869-876. Retrieved from: http://ijph.tums.ac.ir.

Neale, E. O., & Tapsell, L. C. (2019). Perspective: The Evidence-Based Framework in Nutrition and Dietetics: Implementation, Challenges, and Future Directions. *Advances in Nutrition*, *10*(1), 1–8, doi:10.1093/advances/nmy113

Norrman, C. & Bager-Sjögren, L. (2010). Entrepreneurship policy to support new innovative ventures: Is it effective? *International Small Business Journal, 28*(6), 602–619, doi:10.1177/0266242610369874

Rabidas M.C. & Bowen G. (2019). Viral Marketing Consumer Purchase Intention: a theoretical rewiev. *2nd International Workshop on Advances in social Sciences (IWASS 2019). Francis Academic Press, UK*. 254-261. doi: 10.25236/iwass.2019.036.

Richard, G., Malthou, A. & Smith, A. (2015). The Diet and Behaviour Scale (DABS): Testing a New Measure of Food and Drink Consumption in a Cohort of Secondary School Children From the South West of England. *Journal of Food Research, 4*(3), 148-161. doi:10.5539/jfr.v4n3p148.

Soegoto, A. S. & Walewangko, N. E. (2019). Strategy to Increase Consumer Purchasing Decisions in Supermarket Business. *Advances in Economics, Business and Management Research, 112,* 159-163.

Steinhauser, J., Janssen, M. & Hamm U. (2019). Who Buys Products with Nutrition and Health Claims? A Purchase Simulation with Eye Tracking on the Influence of Consumers' Nutrition Knowledge and Health Motivation. *Nutrients*, *11*, 2199. doi:10.3390/nu11092199.

Stewart-Knox, B., Kuznesof, S., Robinson, J., Rankin, A., Orr, K., Duffy, M., Poínhos, R., de Almeida, M. D. V., Macready, A., Gallagher, C., Berezowska, A., Fischer, A. R. H., Navas-Carretero, S., Riemer, M., Traczyk, I., Gjelstad, I. M. F., Mavrogianni, C., & Frewer, J. L. (2013). Factors influencing European consumer uptake of personalised nutrition. Results of a qualitative analysis. *Appetite, 66,* 67–74. doi: 10.1016/j.appet.2013.03.001.

Vlada Republike Srpske. (2018). Smjernice za razvoj privrede Republike Srpske, Banja Luka. Retrieved from: https://www.vladars.net/sr-SP-Cyrl/Vlada/Ministarstva/mpp/Documents/Smjernice%20za%20razvoj%20privrede%20Republike%20Srpske_017877335.pdf.

Voinea, L., Vrânceanu, D. M., Filip A., Popescu V.D., Negrea, T. M., & Dina, R. (2019). Research on Food Behavior in Romania from the Perspective of Supporting Healthy Eating Habits. *Sustainability*, *11*, 5255. doi:10.3390/su11195255.

WHO-EU (World Health Organization Europe). (2018). *Better Food and Nutrition in Europe: A Progress Report Monitoring Policy Implementation in the WHO European Region.* Retrieved from: http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/publications/2018/better-food-and-nutrition-in-europe-progress-report-2018

СТРАТЕГИЈА ПОВЕЋАЊА КОНКУРЕНТНОСТИ ПРОИЗВОДЊЕ У ПРЕХРАМБЕНОЈ ИНДУСТРИЈИ РЕПУБЛИКЕ СРПСКЕ СТИМУЛИСАЊЕМ РАЗВОЈА НОВИХ ПРОИЗВОДА

[1] Славица Грујић, Универзитет у Бањој Луци, Технолошки факултет, Бања Лука, Босна и Херцеговина
[2] Мирјана Грујичић, Универзитет у Бањој Луци, Технолошки факултет, Бања Лука, Босна и Херцеговина

САЖЕТАК

Привредни субјекти у прехрамбеној индустрији могу осигурати конкурентност производње повећањем квалитета производа, усаглашеног са захтјевима потрошача. У посљедњој деценији евидентирано је нагло ширење незаразних обољења људи повезаних са исхраном и пораст интересовања потрошача за нутритивни аспект квалитета прехрамбених производа и правилну исхрану. Циљ овог рада био је да се илуструје методологија за повећање конкурентности производње у прехрамбеној индустрији Републике Српске, базирана на развоју производа усаглашеног са потребама потрошача и принципима правилне исхране. За истраживања са представницима младих потрошача, која се односе на развој прехрамбеног производа на

циљном тржишту, кориштен је структурирани упитник и научне методе. У истраживање је укључено 720 испитаника из јавних образовних установа у Републици Српској. За анализу података кориштена је дескриптивна статистика и корелација. Резултати су показали позитивне статистички значајне коефицијенте корелације ($p<0.05$) између интересовања потрошача за нове производе и: настојања да се правилно хране; састојака производа; производа веће нутритивне вриједности (садржај витамина, минерала, дијеталних влакана); конзумирања воћа, воћних сокова и нискоенергетских пића. Установљена је такође њихова статистички значајна позитивна корелација са знањем о болестима повезаним са исхраном. Анализом података установљено је да се повећање конкурентности производње може постићи развојем прехрамбених производа, базираном на моделовању нутритивних елемената и интересу потрошача за нове прехрамбене производе већег нутритивног квалитета.

Кључне ријечи: *прехрамбена индустрија, конкурентност производње, развој нових производа, правилна исхрана.*

MODERN TECHNOLOGIES AS A DETERMINANT OF SUSTAINABLE ECONOMIC GROWTH AND DEVELOPMENT OF SMALL OPEN ECONOMIES
- Potentials, challenges and possible responses -

1 Radomir Božić, University of East Sarajevo, Faculty of Economics in Pale, Bosnia and Herzegovina
*Corresponding author E-mail: radomir.bozic@ekofis.ues.rs.ba
1 ORCID ID: 0000-0003-3194-2060

ARTICLE INFO
Review Scientific Paper
Received: 28.09.2020.
Revised: 11.11.2020.
Accepted: 09.12.2020.

doi 10.7251/ACE2134085B
UDC
005.94:[005.336.4:334.71

Keywords: *ICT, industry 4.0, innovation, economic growth, productivity, business processes and models, small open economies*

JEL Classification: M2, O3, O4

ABSTRACT

The modern age is characterized by strong development and application of information and communication technologies (ICT) and Industry 4.0, which determine significant changes in the economy and society as a whole, and especially affect production and business processes, economic growth and development, productivity, business models, required qualifications and workers' skills, the education system, as well as people's daily lives. Thanks to that, developed countries are already achieving significant effects in terms of efficiency, productivity, flexibility, gross domestic product (GDP) and living standards growth, and there are opportunities for small open economies to create their own approaches to accelerate growth and convergence with developed countries. Otherwise, the negative consequences known as digital sharing are also possible.

The aim of this paper is to present, based on relevant literature and experiences of individual countries, the potentials, challenges and possible responses of economic and business policy makers aimed at the application of ICT and Industry 4.0 in small open economies, such as the Western Balkans.

The paper is structured as follows: *Introductory remarks* - elaboration of the theoretical basis, characteristics and implications of ICT and Industry 4.0 on the economy and society as a whole; *Methodology* - review of relevant current literature; *Results* - presentation of basic potentials, challenges and possible responses of small open economies in the function of accelerating economic growth; and *Discussion* - concluding remarks and recommendations for possible responses.

1. INTRODUCTION

The development and wide application of modern technologies, primarily information and communication (ICT), in all spheres of human life, from living conditions of individuals, through education, production and business processes and models, to the functioning of the state and society as a whole, essentially transform modern society economy. Therefore, in the relevant literature, modern society is increasingly referred to as information or digital, economic system and economy as a new, digital or knowledge-based economy, and the current fourth industrial revolution as Industry 4.0, or already as Industry 5.0, which begins in Japan and will be based on human-machine cooperation (Petrillo et al. 2018). At the same time, this technological, social and economic environment as a whole is a reality of developed countries and economies, but thanks to the fall in the prices of ICT products and services, they have become available throughout our planet. This provides a chance and opportunity for underdeveloped societies and economies in transition, as well as small and medium-sized businesses, to innovate their business, increase efficiency and competitiveness, and create their own business and development strategies by using the availability of technology, information, knowledge, and markets, which enables them to successfully engage in globalized economic flows.

The new economic and development paradigm of Industry 4.0 represents the integration of IT tools (such as *big data, cloud, robot, 3D printing, simulation*, etc.) by connecting to a global network by transmitting digital data. This enables creation of smart/intelligent solutions that allow to increase the efficiency of business processes and reduce costs through the value chain and maximizing results measured by creating added value. The key ideas of Industry 4.0, initially presented by Kagermann at the Hanover Fair in 2011 (Lee et al. 2014, Zhou et al. 2015), developed in 2013 in Germany and then spread relatively rapidly in Europe and around the world (Zhou et al. al. 2015).

Industry 4.0 has become a generally accepted term in scientific and professional circles, and different authors interpret it in different ways depending on which aspects of this phenomenon are in their opinion crucial. For the purposes of our research in the function of this paper, we provide the following three definitions or understandings of Industry 4.0. The Industrial Internet Consortium (2017) defines Industry 4.0 as the *integration of complex physical machines and devices, with networked sensors and software, used to predict, control, and plan for better business and social outcomes/results.* Kagermann (2014) indicates that Industry 4.0 represents *a new level of organization and management of value chains throughout the life cycle of products.* Hermann et al. (2016) state that Industry

4.0 is *a collective term for technologies and concepts of value chain organization*. Selected definitions, as well as the approaches of many other authors in the relevant literature, indicate that the prevailing understanding is that the essence of Industry 4.0 consists of new technologies, digitalization and robotization, and that key areas or aspects of Industry 4.0 are: Internet of Things (IoT), cyber physical systems (CPS), information and communication technologies (ICT), enterprise architecture (EA) and enterprise integration (EI) (Lu 2017). Accordingly, Industry 4.0 encompasses three basic aspects (Petrillo et al. 2018): (1) *Digitization and increased integration of vertical and horizontal value chains*: development of customized products, digital customer/consumer orders, automatic data transfer, and integrated customer service system; (2) *Digitized offer of products and services*: complete description of products and related services via intelligent networks; (3) *Introduction of innovative digital business models*: a high level of interaction between systems and technological capabilities that develops new and integrated digital solutions. The basis of industrial internet is real-time integration and availability and enterprise-wide control system. The effect of these changes is a radical transformation of traditional "industries", i.e. branches or activities, by changing their approach to work using new technologies, new machines and equipment, new materials and other inputs, with knowledge becoming crucial input (Petrillo et al. 2018). Therefore, strategic, operational, environmental and social opportunities are positive drivers of the implementation of the Industry 4.0 acquis, whereas challenges in terms of competitiveness, future capabilities, as well as organizational and production capabilities limit its progress. For practical application at the micro level, and as a first step in the application of Industry 4.0, it is necessary to provide an adequate understanding of the opportunities and challenges it brings, which depends on the overall characteristics of the company (Müller et al. 2018).

Industry 4.0 and the knowledge-based economy, i.e. their practical application in developed countries, lead to the creation of smart products and smart factories and new business models whose key factor is consumer/customer. They can choose the properties of the products they need and want, as well as change their orders even at the final stage of the production process at no additional cost (Schechtendalh et al. 2015). Smart products contain sensors, recognition components and processors that carry information and knowledge, transmitting them to consumers/customers, as well as feedback to the production system of the smart factory (Abramovici and Stark 2013). Industry 4.0 technologies, methods and tools increase the cost and time efficiency of production processes, product quality and thus overall competitiveness, affecting the entire product life cycle and providing a new way of product production and business (Alberts et al.

2016, Pereira and Romero 2017). New business models based on the Industry 4.0 paradigm establish a complete network communication between different companies, factories, suppliers, logistics, resources, customers/consumers, with real-time business optimization possible for each participant or phase, depending on the demand and status of participants in a network structure, which generates profit maximization of all participants with limited resource sharing (Kagermann et al. 2018). The changes also include traditional business models by their transformation through: (1) additional innovations of value creation and delivery, (2) diversification through reconfiguration of networked value ecosystems, as a radical innovation, but also through creation of new smart business models based on "smartization" of products and service (Ibarra et al. 2018). In the world of Industry 4.0, based on digitalization and automation, new business systems have emerged and are functioning as sustainable, but they have not yet become mainstream (de Man and Strandhagen 2017).

In this overall context of the Industry 4.0 paradigm, the education system as a whole faces additional challenges, including dual education, professional practices, lifelong learning, as well as additional training and education of existing employees in accordance with the needs of the new work environment and new business models. This means that "knowledge workers" need to be prepared for the new business and work environment of Industry 4.0, and probably soon 5.0, which is changing dramatically and requires new, larger and more adequate knowledge and skills. New education systems should therefore, in addition to general IT knowledge and skills and interdisciplinary skills development, anticipate the future needs of a knowledge-based economy and society, as it is very likely that today's students will work in industries or services that did not exist at the time they began their schooling (Maresova et al. 2018).

The key competencies of "knowledge workers" in modern and future manufacturing and service companies in the knowledge economy and paradigm of Industry 4.0 and the upcoming 5.0, will be those based on IT, software, software applications and automated processes and systems. These will include not only basic know-how and the ability to use digital devices, applications, Web 2.0 and various electronic tools, but also the use of required user oriented skills such as: CAD /Computer Aided Design/, CRM /Customer Relationship Management/, ERP /Enterprise Resource Planning/. In addition, communication, social and organizational skills, teamwork, project team work, and intercultural awareness and knowledge of foreign languages will be increasingly important. In order to improve their skills and encourage innovation, "knowledge workers" are expected to be involved in the lifelong learning process (National Institute for Education 2018).

In addition to the above, the application of ICT, as the basis of Industry 4.0 and modern and future knowledge-based economy, in accordance with economic theory and previous empirical evidence, creates significant potential for labor productivity growth and economic growth. Although there is debate in the scientific community about the intensity and dynamics of these impacts, including the controversy of slowing economic growth and accelerating innovation (Gordon 2018), empirical research confirms that the use of ICT during the 1990s significantly contributed to accelerating GDP growth and labor productivity in developed countries, especially in the United States (USA: Jorgenson 2001; Oliner and Sichel 2002; EU15: van Ark et al. 2002; Daveri 2002). Thus, in the USA in the period 2000-02, the average labor productivity grew at a rate of 3.4%, while in the period 1995-2001, that rate was 2.5% (Economist 2003). The positive impact of the ICT and IT sectors on growth and labor productivity in the same period was achieved in Southeast Asia (IMF 2001, Lee and Khatri 2003), as well as in most European transition countries (CEE), which contributed to their convergence with EU15 economies. 2004). Therefore, one must be aware of the empirically confirmed fact that new technologies make a full contribution to labor productivity growth and economic growth with a certain time lag (for example, electricity about 40 years after discovery and application, after more than half of US companies started to use it in production processes) (Piatkowski, 2004). The intensity and dynamics of the effects of the application of ICT significantly depends on the ability of each economy and its companies to use them productively. At the macro level, the diffusion and application of ICT are encouraged by the development and strengthening of economic, institutional and regulatory infrastructure, and at the micro level, changes in the structure, organization and business models of companies.

2. METHODOLOGY - REVIEW OF RELEVANT CURRENT LITERATURE

The issue of ICT, the fourth industrial revolution or Industry 4.0 and their essence and implications for the economy and society as a whole, has attracted special attention of many researchers and institutes of various profiles, creators of economic and business policies, scientific and business conferences, international institutions. .. On the basis of these researches, a large number of papers were created and published.They observe and discuss this complex area from different angles and present the results to the interested academic and business public.

The review of relevant literature for the purposes of this paper was facilitated because we found in the literature and as a further guide selected two papers

that conducted detailed research and presented a review of papers from relevant databases of peer-reviewed papers on Industry 4.0, with the initial "search engine" were key words that are also in line with the goal of our paper. These are the papers:

(1) Maresova, Petra et al. (2018): Consequences of Industry 4.0 in business and economics, *Economies, ISSN 2227-7099, MDPI, Basel, Vol.6, ISS.3, pp. 1-14*, http: //dx.doi,org/10.33907economies6030046
(2) Petrillo, Antonella et al. (2018): Fourth Industrial Revolution: Current Practices, Challenges, and Opportunities. *Digital Transformation in Smart Manufacturing.*

Four researchers from P. Maresova's team made a selection of papers from the Web of Science, Scopus and Science Direct databases, published in the period 2014 - first quarter of 2018, using the following search keywords: Industry 4.0, economy, economic development, production economy and financial sector. In this way, 2275 papers were initially identified, with the most papers published during 2015. By applying the appropriate elimination criteria, all initially "selected" papers were analyzed, and their number was reduced to 292 for further processing, whereas 67 papers were the subject of the final review of the entire content. The paper presented the results and findings of the finally selected 30 papers, of which 20 papers were presented at scientific conferences. The focus of the analysis was to determine whether the papers, i.e. the authors, deal with the following aspects of Industry 4.0 in the context of business and economy: work environment, skills development, economic growth and macroeconomic aspects, sustainability/environment, digitization/smart factories/intelligent manufacturing, security/safety, government policies to support and implement Industry 4.0, and changes in business systems and processes. Detailed description of the topic of each paper in the field of research related to the concept of Industry 4.0 is given for 10 research papers published in academic journals, stating the purpose, basic findings and, most importantly, in the opinion of the authors of this study, the limitations of the study/paper. Key conclusions of the work of Maresova et al. (2018) are: Studies have described the impacts of Industry 4.0 on the labor market, education, changes in operational processes or economic growth. However, many studies do not have a coherent view of the topic they are dealing with. The authors usually focus on the aspect of business and economic implications and continue to examine it more deeply. The papers are usually based on the Industry 4.0 initiative, but omit related initiatives, such as the Work 4.0, Management 4.0, Marketing 4.0 and other initiatives. The connections and relationships of all relevant stakeholders, private and state-owned companies, the state, trade unions and employers' associations, are often ignored. The authors of this

research believe that these interrelationships should therefore be taken into account, in order for individual countries to adequately prepare for the social and economic impacts that the current trend of digitalization and automation brings with it. In the future, one can expect an increasing connection between industry, science, research and new innovative technologies, which must be approached in a complex way to make the transition to Industry 4.0 successful.

The A. Petrillo's research team searched the Scopus database, the largest database of abstracts and peer-reviewed literature, with the term Industry 4.0 being the search engine. The subject of the search were scientific articles, papers presented at conferences and book chapters published in the period from 2012 to 2017, which contain the keywords Industry 4.0 or smart manufacturing. Initially, 886 papers were identified, and having in mind that Industry 4.0, both as a concept and as a new paradigm, originated in Germany, most of them come from Germany. The researchers then focused only on the published papers, of which there were 274 in the observed period. A review and analysis of these papers found that 73% of them relate to engineering issues and aspects, 39.4% to aspects and communication issues and 20.4% on business process management. Further analysis of selected papers was performed using the following seven keywords that characterize Industry 4.0: cyber-physical systems, big data or digitalization, the Internet of Things or wireless communication, automation or artificial intelligence or robotics, additive manufacturing or 3D printers, cloud computing and simulation/augmented/virtual reality. It was determined in what way and to what extent the mentioned keywords were elaborated, and what are the mutual relations in the analyzed papers, as well as the list of the most cited analyzed papers by other authors. The importance of a number of preconditions that need to be met in order to successfully apply the key technologies of Industry 4.0 and achieve positive implications for the economy at the macro and micro level, both in developed and developing countries, was also emphasized. The investment in Industry 4.0 in a sample of 235 European companies in the amount of EUR 140 trillion was also analyzed, which should enable the digitalization of their value chains for more than 80% of companies over the next 5 years.

Having in mind the goal of our paper, the relevant literature was also consulted, which presents the implications and experiences of transition economies, of new EU members, and Central and Southeast European countries in building a knowledge-based economy, ICT application and overall Industry 4.0 acquis, productivity and economic growth and the possibility of successful convergence or catching-up of developed countries (Piatkowski 2004, 2005, Cuaresma et al. 2012, Radosevic 2006, 2009, 2015).

3. RESULTS - PRESENTATION OF BASIC POTENTIALS, CHALLENGES AND POSSIBLE RESPONSES OF SMALL OPEN ECONOMIES IN THE FUNCTION OF ACCELERATING ECONOMIC GROWTH

In accordance with the topic and goal of this paper, our focus is on business and economic aspects, potentials, challenges and possible responses of economic and business policy makers, i.e. the search for an answer to the question: *Whether and with what approach the application of modern ICT can be a determinant of sustainable economic growth and the development of small open economies and a factor that will support their convergence with developed countries?*

Research synthesized in the paper of P. Maresova et al. (2018) point to the following key aspects of the business and economic implications of Industry 4.0:

(1) *Education and work skills* - emphasized need for "intelligent operators" in smart factories for which a new system of education and preparation for the development of adequate skills in a completely changed work environment should be created and implemented. This system implies an innovative and interdisciplinary higher education for new "knowledge workers" with new content in the field of ICT and Industry 4.0, including working methods, which combine alternating schooling and work, including learning practices. In addition, it is necessary to further educate and train "old" or existing workers to make them productive in new digitized production, service and overall business processes and models, through initial retraining and additional training, and subsequent continuing and lifelong education, together with new workers, in order to continuously maintain the necessary competencies in accordance with further innovations and the needs of the knowledge-based economy and society.

(2) *Application of smart technologies, intelligent production and digitalization of production, service and business processes* - which enables highly automated production and business processes and smart systems, especially in some sectors (automotive and electrical industry) in order to adapt faster to changing business environment. This increases cost efficiency, provides prerequisites for better and more successful planning and control systems, more efficient organizational and business models, and production flexibility, even in small batches in manufacturing of mass-produced products.

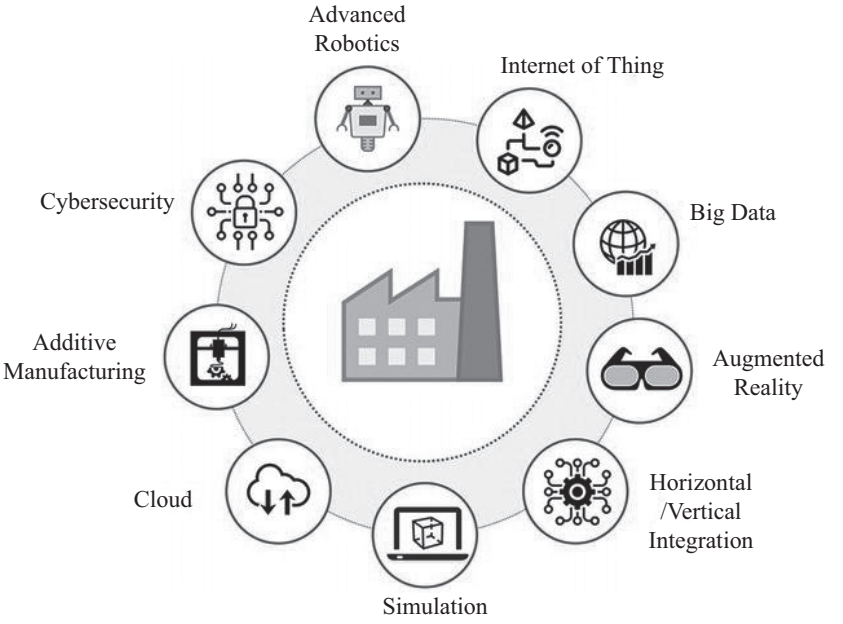
(3) *Government policies as elements of support or the necessary framework* - which enable, improve and promote the process of application of Industry 4.0 in various ways at the national and regional level (education, investment, social policy).

(4) *Changes in the domain of economy or production* - which also determine changes in the structure of industrial indicators that no longer correspond to the structure of GDP. Industry 4.0 is becoming a growth factor, either by applying ICT technologies in existing companies/sectors, or by forming new companies in the IT sector.

(5) *Social transformation, as a result of the digital transformation of the production, service, as well as the public sector* - leading to significant changes in the labor market, which drives changes in the education system. These are changes that will lead to the disappearance of some existing and the emergence of new jobs, which are announced quite dramatically, both in terms of intensity and dynamics. Some research (Osborne and Stroko-sch 2013) indicates that about 47% of all employees in the USA will be at risk of losing existing jobs, while the ratio of the number of "vulnerable" or threatened with disappearance and the number of new jobs in Germany is 7: 6 (Arntz et al . 2016). An adequate response and social approach to current and expected further changes in the labor market is the concept of "digital" education for Industry 4.0 and the knowledge-based economy and society that should combine mechanical and electronic engineering and information technology to develop digital skills in the whole society. In connection with the digitalization of government administration and services for employees, the unemployed and those at risk of unemployment (Kuhnova 2017).

Research synthesized in the work of A. Petrillo et al. (2018) were focused on current practices, challenges and opportunities for the application of the Industry 4.0 acquis, whose main goal is to accelerate and make production more efficient. The key technology of Industry 4.0 is cyber physical systems (CPS), which is a set of several different technologies that create an independent, interconnected and intelligent system of integrated different and physically distant objects/elements. Such cyber physical systems enable the generation and collection of data, their processing and aggregation, and use as support for decision making. Cyber physical systems function at the following 5 levels: (1) *smart connectivity* - obtaining real-time data via intelligent sensors and transmitting them via specific communication protocols; (2) *conversion of data into information* - the possibility of collecting data and their conversion into information that has added value; (3) *digital twins* - the ability to represent real time in digital reality; (4) *cognition* - the ability to identify different scenarios and support the appropriate decision-making process; (5) *configuration* - providing feedback on physical reality from virtual reality and applying corrective actions at the previous level.

Key Technologies of Industry 4.0 are synthesized by the following graphical presentation:



Graph 1. Key Tehnologies of Industry 4.0. Source: Petrillo et al. 2018. p. 9

In order to successfully apply the technologies and achievements of Industry 4.0 and achieve the expected effects, it is necessary to provide appropriate prerequisites, in particular: (1) creating awareness of the importance of innovation, (2) education and innovation management, (3) identifying potential improvements, and (4) creating an appropriate education system that will continuously provide the necessary qualifications and skills for "knowledge workers", both new and retraining and training of existing workers/employees in accordance with the new needs of the labor market in the Industry 4.0 system. It is very important to keep in mind the overall changes determined by the application of system 4.0 (technologies, smart factories, business models, qualifications and skills, market, ...), and the need to adapt appropriate approaches to each individual country, company, research organization.

In line with the above, *the main challenges for developing countries and countries in transition*, which are the focus of our paper, are: (1) training of "intelligent factory operators" as "knowledge workers", in order to acquire specific digital business management skills, (2) flexibility, as there are relatively few companies that have so far implemented the leading 4.0 systems, and (3) the

need to provide adequate funding to begin the process of planning the introduction of the Industry 4.0 system at the national or regional level.

Industry 4.0 has a significant impact, not only on the IT sector, but also on traditional industries, such as oil and gas production, electricity generation and distribution, rail transport and mining. The economic opportunities and implications of Industry 4.0 are very broad and affect the entire economy and all countries. The greatest expected economic effects will be in the most developed countries that invest the most in Industry 4.0 technologies, which contributes to strengthening their national economies, but through outsorcing undisputedly motivated by economic reasons, these effects will be transferred to countries with low costs and incomes.

Industry 4.0 has the potential to significantly improve business processes in manufacturing companies through greater: (1) *efficiency* - savings of raw materials, materials and energy; (2) *productivity* - through the application of intelligent technologies; (3) *flexibility* - using cyber-physical systems; (4) *individualization of demand* - by integration of customers/consumers into networks/cyber physical systems/ and (5) *decentralization* - faster decision-making based on available data. In order for this potential to become a reality and for the stated effects to be realized, the companies that claim them must first invest significant funds in Industry 4.0 technologies. Only large and financially strong companies can afford that "satisfaction", and an additional problem is that it is difficult to objectively assess the return on such an investment. Therefore, countries that have the ambition to use the potential of Industry 4.0 for further economic growth should, through appropriate economic policy measures, create and implement national and regional investment plans in this area, as well as incentives for companies to invest in Industry 4.0. Companies that for any reason stay out of the changes brought about by Industry 4.0, risk business failure and disappearance from the business scene as a result of technological lagging behind competitors. Therefore, facing the current and especially future challenges of strengthening the competitive position imposes as a strategic goal the digitalization of production processes based on Industry 4.0 technologies, the creation of new business models in the real, financial and public sectors. This strategic goal results in obligations for companies, governments, universities and the education system as a whole, science, researchers and research centers, financial and other institutions, to develop the national research and innovation systems, in order to create their own technological and innovative potentials, including also transfer and successful application of current and new technologies, which can be a factor of convergence of developing countries and small open economies, i.e. reaching the level of development and income in developed economies and societies.

The set of changes brought about by Industry 4.0 significantly modifies the work environment and work patterns, which determines the need to adapt the education system as a whole, including higher education, alternating education and jobs for new "knowledge workers", and lifelong learning and continuing education of all employees through investment of employers in maintaining and acquiring their new knowledge and skills. New skills should, among other things, enable more efficient bridging of the gap between engineering and information sciences, automatic learning and artificial intelligence, which have become a reality of modern times, and create a precondition for efficient and integrated application of all acquired knowledge. In order to adequately respond to these challenges, university study programs should be designed to prepare future "workers" for the needs of the factories of the future. Acquiring computer knowledge and skills and learning foreign languages should be a mandatory, not an optional part of modern university studies. The study should be more student-friendly, with the easing of bureaucratic procedures, additionally supported by summer schools focused on raising awareness of computer science, and mandatory visits to smart factories. Through these visits and student internships, it is possible for students to get acquainted with their functioning as a company, but also for these companies to acquaint students with the technologies they apply (Petrillo et al. 2018). In order to provide appropriate skills for "knowledge workers", in addition to university education as the first stage, further professional development (school/work transition/) is very important, as a phase that provides the first technical qualification to future workers. This is realized through various workshops, which include technical issues as well as the acquisition of "soft skills", and work in university companies that allow students to adapt their profiles to the requirements of companies in which they will develop their business careers and contacts with these companies. Student internships also enable the acquisition of technical experiences, as well as the development of personal skills and inclinations for teamwork. Finally, the third and final stage of professional development, the phase of continuous education and training of the "intelligent factory operator", as a key worker of smart factories, is the inevitability for every smart factory to continuously invest in additional education of its employees in order to maintain and improve their knowledge and skills in modern conditions.. This is confirmed by the data that more than 80% of the total of over 300 American manufacturing companies during 2013 and 2014 invested about $ 1,000 per year in continuous training of each employee (Acenture, Manufacturing Institute 2014).

Previously elaborated potentials, challenges, as well as approaches of economic and business policy makers are significantly and successfully applied in a num-

ber of developed world economies. In the context of the aim of this paper, the question arises: *What are the opportunities and chances for small open economies in such a modern economic environment that have an urgent need to accelerate their economic growth and reduce the income and living gap in relation to developed countries?*

The results of relevant research have confirmed that the potential for accelerating economic growth exists in underdeveloped and transition countries, small and open economies, by investing in the transfer and application of technologies and knowledge from developed countries, which base their growth on their own innovations and technological progress, which is a slower process. It is about the so-called iron law of convergence or the catching-up effect that allows countries that create and implement an appropriate approach to technology transfer and application from more developed countries a convergence rate of about 2% per year (see more in: Barro and Sala-i-Martin 1992, Rodrik 2013, Barro 2015, Petrović et al. 2019). Transfer and application of knowledge and technologies from developed countries is also possible through foreign direct investment (FDI), as one of the modalities of inclusion in global value chains. At the same time, countries that strive for faster growth and successful convergence should create and implement their own approach, which will provide appropriate positioning at the beginning or end of global value chains, in order to maximize added value, based on its creation and retention. This means it should be borne in mind that the legality and the fact that research and development and design are initial activities in the value chain, represented by a smiling curve, and marketing and services are the final ones that provide the highest added value (OECD 2013). Therefore, it is necessary to develop one's own capacities in these areas in order for companies, regions and countries to be competitive and a partner to "key players" in global value chains at these stages, and not only in production activities characterized by the lowest added value. The overall effect of upgrading own economic performance of all participants will depend on the successful or desirable positioning in global value chains. This assessment is confirmed by the experiences and results achieved in this area by the countries of the Visegrad Group (V4). The results of empirical research (Vlčkova 2015) indicate that these countries, measured by the participation index, are among the most integrated into global value chains. However, this share is based on a high share of foreign value added, a low share of services in their exports and a dominant share of production activities, due to the size of these economies (with the exception of Poland), production orientation, and the fact that these countries have served as a platform. for outsourcing manufacturing activities, mainly to German companies. In order to improve their position and achieve greater eco-

nomic benefits from participation in the global value chains the V4 countries, as well as other small open economies, need to improve the level of education and skills and flexibility of the workforce, to improve and develop their own research and development potential. environment, strengthen and stabilize institutions, critically assess the role of FDI, strengthen domestic ownership in companies to prevent the repatriation of profits. The goal of these activities is to provide control over what, how and for whom to produce (Vlčkova 2015) in order to make the most of share in global value chains. In addition to the above, research on the external dimensions of smart specialization provided through participation in global value chains in the countries of the European Union admitted to membership after 2004 (EU13) (Radosevic and Stancova 2015), indicate that the effects of technology transfer and improvement largely depend on whether countries and regions use through mutual cooperation the global value chains and international research and development networks as levers, connections and learning mechanisms in the process of smart specialization. Global value chains and the multinational companies that establish them can be drivers of productivity growth and economic growth, if used as mechanisms of learning and innovation in "domestic" companies. This requires an appropriate approach/policies that: (1) stimulate demand (not supply), drive FDI in research, development and innovation, (2) focus on the quality of FDI and global value chains, (3) integrate FDI and innovation policy, (4) develop a strategic approach to the internationalization of research and development, and (5) strengthen and upgrade horizontal links in the innovation system.

In addition, countries striving for faster and sustainable growth, such as all Central and Eastern European (CEE) countries, should, as part of their overall development and convergence strategy and policy, accept, promote and implement structural changes in the function of building society and knowledge-based economies, including the technologies and changes that Industry 4.0 brings with it (Piech and Radosevic 2006). Unlike the period at the end of the 20th and the beginning of the 21st century, when the growth of these countries was achieved due to redistribution and efficiency increase based on FDI production capacity (static modernization effect), future growth will depend on technology accumulation and FDI spillover effect (dynamic effect of modernization) (Szalavetz 2000). Thus, the path and transition to a knowledge-based society and economy does not only mean focusing on the knowledge-based manufacturing sector and branches or activities based on high technologies, but also the diffusion and application of new technologies throughout the economy by stimulating innovation systems in order to make the economic growth based on the "new" economy long-term. Therefore, it is necessary to encourage the development of

the knowledge intensive services sector (KIS - knowledge intensive services), as well as all sectors to use ICT technologies, not just the IT sector. Given that CEE countries with small open economies are highly dependent on access to foreign markets and FDI, it is very important that they link their national innovation policies and systems appropriately to FDI and the global value chains in which they are involved (Piech and Radosevic 2006). Research also indicates that the competitiveness of Southeast European countries in the context of integration and convergence with developed European countries largely depends on their individual research and development potentials (primary infrastructure, human resources, institutions), as well as joint research and their funding, where through mutual cooperation they present themselves as partners who can be partners to the economies of the European Union (Radosevic 2009). This cooperation has the potential to help overcome obstacles and bottlenecks, and also to strengthen national and joint innovation systems, which will be able to base convergence or catch-up strategies, not only on imitation of available technologies and knowledge, but also on their adaptation. and innovation, so that the ability to innovate and the importance of science for convergence remain crucial (Fagerberg and Srholec 2005). One of the important messages is that the traditional definition and treatment of science and technology policy as a sectoral policy should be expanded so that its focus is on connecting public research and development institutions with domestic industry, agriculture and the medical sector, and use of international assistance to integrate research and technological development in the countries of Southeast Europe into European programs and better interconnection of local innovation systems (Radosevic 2009).

The research team of Cuaresma C, and others (2012) sought to answer the question of who are the drivers of growth, convergence and prosperity of 11 countries of the European Union (EU11) (Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovenia and Slovakia). This group of developing countries initially achieved impressive results in the development of the market economy and its positioning in the institutions of the European Union. The per capita income convergence process with developed Western European countries (EU15) is expected to continue, but at a slower pace. At the same time, the greatest contribution to further convergence is expected from the reduction of the gap in investment in human capital in relation to the EU15. In the area of trade and finance, integration between the EU11 and this group of EU15 countries is expected to continue, and the focus will be on strengthening stability in cross-border banking. In the field of enterprise and innovation the good results have been achieved in job creation, productivity growth and competitiveness in the international market, but innovation indicators indicate that

the group of EU11 countries is lagging behind other EU member states. Demographic trends in Europe raise questions about the sustainability of the European growth model, pension policies as well as policies to close the education gap, incentives for labor market participation and the return of skilled workers will be increasingly important for the economies of EU11 countries. Although the integration of EU11 countries has helped to improve the quality of government work by strengthening the rule of law, economic openness, and promoting the right to vote and accountability accompanied by high costs for social benefits, public administration and governments in the EU11 are less efficient than in the EU15 and in developing countries with a similar level of income, which is negatively reflected on growth. In addition, in line with the further expected deterioration of the demographic situation, pressures for higher social spending are expected.

A significant contribution to the study and consideration of the impact of ICT, Industry 4.0 on growth in transition economies, as well as the potential for economic development in the new EU countries and candidate countries, is provided by empirical research presented in M. Piatkowski in 2004 and 2005.

The paper "The Impact of ICT on Growth in Transition Economies" (Piatkowski 2004) analyzes the multi-channel contribution of ICT to growth in labor production and productivity in eight CEE transition economies (Bulgaria, Czech Republic, Hungary, Poland, Romania, Russia, Slovakia and Slovenia). in the 1995-2001 period.

This paper, i.e. research in the function of its development, is a significant contribution to understanding the potential and impact of ICT in developing countries and transition economies, given that most of the available literature mainly contains research results of ICT contribution to accelerating GDP growth and labor productivity in developed countries. especially in the United States. This contribution was especially emphasized during the 90s of the last century. Despite the collapse of the "internet bubble" and the unfulfilled expected stronger effect of the "new economy", it seems that technological advances brought by ICT have not stopped, as evidenced by the continuously high growth rates of labor productivity in the US which during 2000-02 were on average 3.4% versus "only" 2.5% in the period 1995-2001. (Economist 2003). Similar trends have been observed in other developed countries, including Ireland, the Netherlands, Australia, Denmark and the United Kingdom (OECD 2004, 2003, van Ark and Piatkowski 2004). In contrast, there has been little research and evidence in published papers on the impact of ICT on the economies of developing countries and transition economies. Exceptions are several IMF publications (IMF 2001) which indicate that there is a positive impact of ICT on output growth in the late

1990s in selected Southeast Asian countries, and the paper of Lee and Khatri (2003) proving the impact of capital investment in ICT on economic growth in the countries of Southeast Asia. The first assessments of the impact of ICT investment in ICT and the contribution to economic growth and productivity growth in the 4 new EU member states, members of Group V4 (Czech Republic, Hungary, Poland and Slovakia), based on growth accounting methodology, are presented in M. Piatkowski (2003). This methodology was also used in the paper of the same author who investigates the impact of ICT on growth in eight transition economies (Piatkowski 2004). Starting from the fact that ICT products and services are the results of "production" of ICT industry or sector and at the same time input for branches/activities that use ICT products and services, the overall impact of ICT on economic growth is realized through the following 4 channels: (1) production of goods and services, which directly contribute to the growth of aggregate value added created in a given economy; (2) increase in total factor productivity (TFP) of production in the ICT sector, which contributes to the growth of total factor productivity in a given economy; (3) the use of ICT capital as an input in the production of other products and services; and (4) contribution to total factor productivity in the economy as a whole based on productivity gains in non-ICT products and services sectors, determined by the production and use of ICT (spillover effect).

This research found that during the observed period, ICT provided a significant contribution to GDP growth and labor productivity in the eight transition countries covered by the research, with significant differences between the analyzed countries. The contribution of ICT through the increase in the value of capital/investment in ICT and the growth of total factor productivity in the ICT manufacturing sector brought an average of 0.87 percentage points to production growth in four CEE countries (Czech Republic, Hungary, Poland and Slovakia), for which only there were enough data. The stated aggregate contribution of ICT in these countries was higher than in the developed 15 EU countries (EU15), which in the same period was 0.73 percentage points. Based on these indicators, it can be concluded that ICTs have contributed to convergence, i.e. catching up with the EU15 by these four CEE countries (V4). The survey also found that the contribution of ICT capital alone to output growth in the five leading CEE countries (previous four countries plus Slovenia) averaged 0.61 percentage points, and was significantly higher than in the EU15 countries (0.46 percentage points on average). However, in the remaining three analyzed countries (Bulgaria, Romania and Russia), the contribution of ICT capital to the growth of production was much lower than in the previously mentioned five leading CEE countries, but also lower than in the EU15 countries. A similar "pattern"

was confirmed by comparing the contribution of ICT capital to labor productivity growth. Therefore, this research found that in the three mentioned "lagging" transition economies, ICT did not enable convergence, i.e. catching up with the EU15 countries, but on the contrary, the gap in the level of development and income was deepened.

The research was also focused on the future perspectives of economic growth of the analyzed countries. Given the fact that post-transition growth reserves in the observed countries are largely depleted, it was assumed that the future growth of these economies will largely depend on the ability and capacity to use ICT productively. The Polish economy was taken as a projection of future impact, and it was estimated that ICT capital is likely to contribute 0.6 percentage points to the average GDP growth of 4% in the period until 2025, without taking into account the possibility of finding new, more productive ICT applications, which could further increase the contribution of ICT to economic growth and productivity growth. In addition, the mentioned spillover effect should be borne in mind, as there is a realistic expectation that the increasing use of ICT will accelerate the pace of innovation and knowledge diffusion, and that firms/companies, industries/branches and the economy as a whole will have a chance to accelerate productivity growth through imitation, acceptance and application of concepts, models and ideas developed by other more developed countries. However, it is very wrong and dangerous to expect that ICT will be able to be used productively in any country, branch or activity, or company, without providing appropriate assumptions. These assumptions necessarily include changes, i.e. reviewing and adjusting economic policies at the macro level, changes in the structure, organization and business models at the micro level, improving the level of knowledge and ICT skills of the workforce. The experience of countries that have been successful in this field so far, indicates that the continuous and consistent improvement of economic, institutional and regulatory infrastructure must be ensured at the macro level, in order to accelerate economic growth and productivity growth, based on technological progress and its application, in modern conditions embodied in ICT and their diffusion and application. In this context, economic policies, which seek to maximize the benefits of ICT and Industry 4.0 as a modern scientific and business paradigm, must focus on creating a favorable business environment, open borders for trade, increasing foreign capital inflows and spending on human capital, improving law enforcement efficiency, strengthening macroeconomic stability, and above all, promoting competition in the labor market.

The paper "The Potential of ICT for Development and Economic Restructuring of the New Member States and Candidate Countries" (Piatkowski 2005) presents

some of the key research results of one of the studies within the project "Foresight on Information Society Technologies in an Enlagred Europe" (FISTE), realized by the Institute for Prospective Technological Studies, one of the seven research institutes within the DG Joint Research Center (JRC) of the European Commission. The survey covered new EU member states at the time: the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia, including also candidate countries: Bulgaria, Romania and Turkey, and Croatia, which has not yet had candidate status. Within this project, monographs were created for all the mentioned countries, based on the conducted research. They present analyses of the development of the information society in each of the countries, positive and negative impacts, strengths and weaknesses of each country, and give a look at the possible outcomes, based on quantitative data. The synthesized report and accompanying reports presented at the expert workshops identified three main challenges that will affect the development of the information society in Europe in the next decade: (1) Changing competitive pressures: the potential of ICT for economic growth; (2) Growing social divisions: the role of ICT in social or digital disparities; and (3) Growing demographic pressure: the tertiary transition in education. The key findings of the conducted research related to the first mentioned challenge can be synthesized as follows:

1) ICT can help annaylzed countries (new EU members) in the process of economic convergence or catching up with developed European countries (EU15)
   The application of ICT provides faster productivity growth in CEE countries at the macro level, as well as at the level of branches/activities in relation to the EU15 and the USA. The research found that ICTs during the period 1995-2001 contributed to reducing the income disparities of the five leading CEE countries compared to the EU15. However, the gap between Bulgaria and Romania has widened, as the application of ICT has not encouraged convergence with the EU15 due to the weakness of their economic and institutional environment during the survey period.
2) There is potential for productivity growth in ICT-based sectors using ICT
   The research showed that there is a significant potential for productivity growth, based on the application of ICT, not only in the IT sector, but also in other sectors that do not produce products and provide services in the field of ICT, if they successfully apply ICT in their activities. Therefore, these sectors (branches or activities) will benefit more or less based on the application of ICT, depending on how successfully they can apply ICT in their activities. To the extent that this potential of ICT is realized,

individual countries and branches or activities can accelerate economic growth and increase the degree of convergence or catching up of developed EU15 countries.

The key conclusion of these studies is that the analyzed countries, which aspire to faster economic growth in modern information or society and knowledge-based economies and paradigms of Industry 4.0, should create and implement policies that encourage greater use of ICT in all sectors, activities, including the public sector, and create an economic and institutional environment in which the business sector will invest more in ICT. This is a precondition for contributing to a significant acceleration of economic growth through the development of the information society in these countries in line with the Lisbon Strategy.

4. DISCUSSION - CONCLUDING REMARKS AND RECOMMENDATIONS FOR POSSIBLE RESPONSES

In the relevant literature, strategic acts, including also everyday business communication, modern society is increasingly referred to as information or digital, economic system and economy as a new, digital or knowledge-based economy, and the current fourth industrial revolution as Industry 4.0. This technological, social and economic environment as a whole is a reality of developed countries and economies, but its achievements have become available throughout our planet. This provides an opportunity for underdeveloped societies and economies in transition, as well as small and medium-sized businesses, to use the availability of technology, information, knowledge, and markets to innovate their businesses, increase efficiency and competitiveness, and create their own business and development strategies that enable them to successfully engage in globalized economic flows.

The new economic and development paradigm of Industry 4.0 represents the integration of IT tools (such as big data, cloud, robot, 3D printing, simulation, etc.) by connecting to a global network by transmitting digital data. On this basis, smart/intelligent solutions can be created to allow to increase the efficiency of business processes and reduce costs through the value chain and maximize results measured by creating added value. The application of this modern paradigm implies: (1) *Digitization and increased integration of vertical and horizontal value chains*; (2) *Digitized offer of products and services and* (3) *Creation and application of innovative digital business models.* The effect of these changes is not only the strong development of the IT sector, but also the radical transformation of traditional "industries", i.e. branches or activities, by changing their approach

to work by using new technologies, new machines and equipment, new materials and other inputs, whereby knowledge becomes the crucial input.

The set of changes brought about by Industry 4.0 significantly changes the work environment and work patterns, which determines the need to adapt the education system as a whole, including higher education, alternating education and jobs for new "knowledge workers", and lifelong learning and continuing education of all employees through employers' investing in maintaining and acquiring their new knowledge and skills. New skills should, among other things, enable more efficient bridging of the gap between engineering and information sciences, automatic learning and artificial intelligence.

In order to successfully apply the technologies and achievements of Industry 4.0 and achieve the expected effects, it is necessary to provide appropriate prerequisites, such as: (1) creating awareness of the importance of innovation, (2) education and innovative management, (3) identifying potential improvements, and (4) creating an appropriate education system that will provide the necessary qualifications and skills for "knowledge workers" on a continuous basis, both for new workers, and retraining and additional training of existing workers or employees, in accordance with the new needs of the labor market.

The application of ICT, as the basis of Industry 4.0 and modern and future knowledge-based economics, in accordance with economic theory and previous empirical evidence, creates significant potential for labor productivity growth and economic growth. Although there is debate in the scientific community about the intensity and dynamics of these impacts, empirical research confirms that the use of ICT during the 1990s significantly contributed to accelerating GDP growth rates and labor productivity in developed countries, especially in the United States. Thus, in the USA in the period 2000-02, the average labor productivity grew at the rate of 3.4%, while in the period 1995-2001 that rate was 2.5%. The positive impact of the ICT and IT sectors on growth and labor productivity in the same period was achieved in Southeast Asia, as well as in most transition European countries (CEE), which contributed to their convergence with the economies of EU15 countries. Yet, one should keep in mind the empirically confirmed fact that new technologies make a full contribution to the growth of labor productivity and economic growth with a certain time lag. The intensity and dynamics of the effects of the application of ICT significantly depends on the ability of each economy and its companies to use them productively. At the macro level, the diffusion and application of ICT encourages the development and strengthening of economic, institutional and regulatory infrastructure, and

at the micro level, changes in the structure, organization and business models of companies.

Industry 4.0 has the potential to significantly improve business processes in manufacturing companies through greater: (1) *efficiency* (2) *productivity* (3) *flexibility* (4) *individualization of demand* and (5) *decentralization*. In order for this potential to become a reality and for the stated effects to be realized, the companies that claim them must first invest significant funds in Industry 4.0 technologies. Companies that for any reason stay out of the changes brought by Industry 4.0, risk business failure and disappearance from the business scene as a result of technological lag behind competitors.

The following question logically arises in the context of the aim of this paper: *What are the opportunities and chances in such a modern economic environment for small open economies that have an urgent need to accelerate their economic growth and reduce the income and living standard gap with developed countries?*

The results of relevant research have confirmed that the potential for accelerating economic growth exists also in underdeveloped and transition countries, small and open economies, by investing in the transfer and application of technologies and knowledge from developed countries, which base their growth on their own innovations and technological progress, which is more expensive and slower process. It is about the so-called iron law of convergence or the catching-up effect, which allows countries that create and implement an appropriate approach to technology transfer and application from more developed countries a convergence rate of about 2% per year. One of the studies listed in this paper found that ICTs in the period 1995-2001 in the V4 group of countries and Slovenia contributed to the growth of production and productivity more than in the developed countries of the EU15, and thus convergence, i.e. catching up with the EU15 countries. In contrast, in the remaining three analyzed CEE countries, ICT contributed significantly lower to production growth than in the five leading CEE countries, and also lower than in the EU15 countries, as a result of which ICT did not enable convergence in these three transition economies or the catching-up effect. On the contrary, the gap in the level of development and income has deepened. Transfer and application of knowledge and technologies from developed countries is possible through foreign direct investment (FDI), as one of the modalities of inclusion in global value chains. The countries that aspire to faster growth and successful convergence should create and implement their own approach, which will provide appropriate positioning at the beginning and/or end of global value chains, in order to maximize added value. This means one should consider that legality and the fact that initial activities in the value chain

represented by the "smile curve" are research and development and design, and the final ones are marketing and services, those that provide the highest added value, its creation and retention.

However, it would be wrong to expect that ICT will be able to be used productively in any country, branch or activity, or company, without providing appropriate preconditions. These preconditions necessarily include changes, i.e. reviewing and adjusting economic policies at the macro level, changes in the structure, organization and business models at the micro level, improving the level of knowledge and ICT skills of the workforce. The experiences of countries that have been successful in this field so far, indicate that continuous and consistent improvement of economic, institutional and regulatory infrastructure must be provided at the macro level, in order to accelerate economic growth and productivity growth, based on technological progress and its application, in modern conditions and embodied in ICT - their diffusion and application. In this context, economic policies, which seek to maximize the benefits of ICT and Industry 4.0, must focus on creating a favorable business environment, open borders for trade, increasing foreign capital inflows and spending on human capital, improving law enforcement efficiency, strengthening macroeconomic stability, as well as the promotion of competition in the labor market.

The key conclusion that emerges from the results of relevant research is that all countries, which aspire to faster economic growth in modern information or society and knowledge-based economies and paradigms of Industry 4.0, and especially small and open economies, should create and implement policies that encourage greater use of ICT in all sectors, branches or activities, including the public sector, and create an economic and institutional environment in which the business sector will invest more in ICT.

Facing the current and especially future challenges of strengthening the competitive position imposes as a strategic goal the digitalization of production and business processes based on Industry 4.0 technologies, the creation and application of new business models in the real, financial and public sectors. This strategic goal imposes obligations for companies, governments, universities and the education system as a whole, science, researchers and research centers, financial and other institutions, to develop national research and innovation systems, in order to create their own technological and innovative potentials, and transfer and successful application of current and new technologies, which can be a factor in the convergence of developing countries and small open economies, i.e. reaching the level of development and income in developed economies and societies, and therefore the determinants of sustainable economic growth and development.

REFERENCES

Abramovici, M. and Stark, R. (2013). *Smart Product Engineering: Procededings of the 23rd CIRP Design Conference,* Bochum, Germany, March 11-13. Lecture Notes in Production Engineering. Berlin/Heildelberg: Springer. ISBN 978-3-642-30816-1.

Accenture Manufacturing Institute. (2014). *Accenture 2014 Manufacturing Skills and Training Study–Out of Inventory Skills Shortage Threatens Growth for US Manufacturing*. Retrieved from: http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-2014-Manufacturing-Skills-Training.pdf,

Alberts. A. et al. (2016). Procedure for Defining the System of Objectives in the Initial Phase of an Industry 4.0 Project Focusing on Intelligent Quality Control Systems. *Procedia CIRP, 52*, 262-67.

Arntz, M. et al. (2016). The Risk of Automatization for Jobs in OECD Countries, *OECD Social, Employment and Migration Working Papers*. Paris: OECD Publishing.

Barro, R.J. (2015). Convergence and modernisation. *The Economic Journal, 125*(585), 911-942.

Barro, R.J., Sala-i-Martin, X. (1992). Convergence. *Journal of political Economy, 100*(2), 223-251.

Božić, R. (2016). Kako do održivog ekonomskog rasta u malim otvorenim ekonomijama? *Zbornik radova Naučni skup: Ekonomija danas – Slobode, konkurencija, subvencije*, Univerzitet u Istočnom Sarajevu, Andrićgrad.

Brynjolfson, E. (1993). *The Productivity Paradox od Information Technology. Review and Assessment*. Retrieved from: http://ccs.mit.edu/papers/CCSWP130/ccswp130.html

Brynjolfsson, E. and Hitt, L.M. (1996). Paradox Loss? Firm-level Evidence on the Returns to Information System Spending. *Management Science, 42*(4), 541-558.

Brynjolfsson, E. and Hitt, L.M. (2000). Beyond Computation: Information Technology, Organizational Transformation and Business Practices. *Journal of Economic Perspectives*, *14*(4), 23-48. Retrieved from: http://ebusiness.mit.edu/erik/JEP%20Beyond%20Computation%209-20.pdf

Colecchia, A. and Schreyer, P. (2001). *ICT Investment and Economic Growth in the 1990's: is the United States a Unique Case?* A Comparative Study of Nine OECD Countries. OECD, DSTI/DOC 2001)/7th October

Cuaresma, J. et al. (2012). *Drivers of Convergence in Eleven Eastern European Countries*. The World Bank, Europe and Central Asia Region, Poverty Reduction and Economic Management Department. August 2012, WPS6185, Public Disclosure.

Daveri, F. (2002). *The New Economy in Europe (1992-2001).* Working paper, 213, University of Parma and IGRIER.

de Man, J.C. and Jan Ola Strandhagen (2017). An Industry 4.0 Research Agenda for Sustainable Business Models. *Procedia CIRP, 63*, 721–26.

Godin, B. (2006). The Knowledge-Based Economy: Conceptual Framework or Buzzword. *Journal of Technology Transfer, 31*(1), 17-30.

Gordon, R. (2018). *Why Has Economic Growth Slowed When Innovation Appears to be Accelerating?* NBER Working Paper No. 24554.

Đuričin, D. and Vuksanović, I. (2016). Platforma za vođenje ekonomske politike u uslovima četvrte industrijske revolucije. *Zbornik radova sa 11. Međunarodnog simpozijuma o korporativnom upravljanju: Ekonomije malih zemalja u uslovima pojačanih globalnih izazova*. Finrar i Ekonomski fakultet Univerziteta u Banja Luci, Banja Vrućica.

Đuričin, D. and Kuč, V. (2018). Ekonomski kontekst za dostizanje EU korišćenje digitalne transformacije. *Zbornik radova sa 13. Međunarodnog simpozijuma o korporativnom upravljanju: Digitalna ekonomija pokretač budućeg ekonomskog rasta*. Finrar i Ekonomski fakultet Univerziteta u Banja Luci, Banja Vrućica.

The Economist. (2003). *The new 'new economy'*. 11 September.

Foray, D. (2013). The Economic Fundamentals of Smart Specialisation. *Ekonomiaz*, *83*(2), 83-102.

Hermann, M. et al. (2016). Design Principles for Industrie 4.0 Scenarios. Paper presented at 2016 49th *Hawaii International Conference on System Sciences (HICSS),* Koloa, HI, USA, 3928–37.

Ibarra, D. Et al. (2018). Business model innovation through Industry 4.0: A review. *Procedia Manufacturing 22*, 4-10.

Industrial Internet Consortium. (2017). A *Global Industry First: Industrial Internet Consortium and Plattform Industrie 4.0 to Host Joint IIoT Security Demonstration at Hannover Messe 2017*. Retrieved from: https://www.iiconsortium.org/pressroom/04-20-17.htm

Jalava, J. and Pohjola, M. (2002). Economic Growth in the New Economy: Evidence from Advanced Economies. *Information Economics and Policy* 14(2), 189-210.

Jorgenson, D.W. and Stiroh, K. J. (2000). Raising the Speed Limit: U.S. Economic Growth in the Information Age. *Brookings Papers on Economic Activity, (1),* 125-211. Retrieved from: http://www.ny.frb.org/rmaghome/economist/stiroh/ks_grw.pdf

Jorgenson, D.W. (2001). Information Technology in the US Economy. *American Economic Review, 91*, (March), 1-32.

Kagermann, H. et al. (2014). Chancen von Industrie 4.0 nutzen. In *Industrie 4.0 in Produktion, Automatisierung und Logistic.* Wisbaden: Springer, 603-14.

Kagermann, H. et al. (2018). *Industrie 4.0: Mit dem Internet der Dinge auf dem Weg zr 4. Industriellen Revolution-DFKI.* Retrived from: https://www.dfki.de/web/presse/presshighlights/industrie-4-0-mit-dem-internet-der-dinge-auf-dem-weg-zur-4-industriellen-revolutio/view

Kastels, M. (2000). *Uspon umreženog društva*. Zagreb.

Krsmanović, B. (2015). Informatičko društvo i ekonomija zasnovana na znanju. *Zbornik radova sa 10. Međunarodnog simpozijuma o korporativnom upravljanju: Male ekonomije i nove paradigme ekonomskog rasta*. Finrar i Ekonomski fakultet Univerziteta u Banja Luci, Banja Vrućica.

Kuhnová, I. (2017). *The Fourth Industrial Revolution Calls for Innovation in Education*. Retrieved from: https://www.bozpinfo.cz/josra/ctvrta-prumyslova-revoluce-si-zada-inovace-ve-vzdelavani

Lee, I. and Khatri, Y. (2003). *Information Technology and Productivity Growth in Asia*. IMF Working Paper.

Lee. J. et al. (2014). Service Innovatio and SmartAnalytics for Industry 4.0 and Big Data Environment. *Procedia CIRP, 16*, 3-8.

Lu, Y. et al. (2017). A survey on technologies, applications and open research issues. *Journal of Industrial Information Integration, 6*, 1-10.

Machlup, F. (1962). *The Production and Distribution of Knowledge in the United States*. Princeton: Princeton University Press, USA.

Maresova, Petra, et al. (2018). Consequences of Industry 4.0 in business and economics. *Economies*, MDPI, 6(3), 1-14, Basel, Retrieved from: http://dx.doi,org/10.33907 economies6030046

Mitrović, Đ. (2013). *Ekonomski i institucionalni aspekti razvoja informacionog društva*. Beograd, Srbija: Centar za izdavačku djelatnost Ekonomskog fakulteta u Beogradu.

Müller, J.M. et al. (2018). What Drives the Implementation of Industry 4.0? The Role of Opportunities and Challenges in the Context Sustainability. *Sustainability 10*, 247.

National Institute for Education (2018). *The Topics. National Institute for Education*. Retrieved from: http://www.nuv.cz/ourwork

OECD. (2003). *ICT and Economic Growth: Evidence from OECD Countries, Industries and Firms*. Paris, France: OECD.

OECD. (2004). *The Economic Impact of ICT*. Paris, France: OECD.

OECD. (2013). *Interconnected Economies: Benefiting from Global Value Chains*. OECD Publishing.

Oliner, S.D. and Sichel D.E. (2002). Information Technology and Productivity: Where Are We Now and Where Are We Going? Washington DC, USA: Federal Reserve Board.

Osborne, S.and Strokosch, K. (2013). It takes Two to Tango? Understanding the Co-production of Public Services by Integrating the Services Management and Public Administration Perspectives. *British Journal of Management, 24,* S31–S47.

Pereira, A.C. and Romero, F. (2017). A review of meaninigs and implemenattions of the Industry 4.0 concept. *Procedia Manufacturing, 13*, 12069-14.

Petrillo, Antonella et al. (2018). Fourth Industrial Revolution: Current Practices, Challenges, and Opportunities. *Digital Transformation in Smart Manufacturing*.

Petrović, P., Brčerević, D. and Gligorić, M. (2019). Zašto privredni rast Srbije zaostaje? *Ekonomika preduzeća, 67*(1-2).

Piatkowski, M. (2002). The 'New Economy' and Economic Growth in Transition Economies. The Relevance of Institutional Infrastructure. WIDER Discussion Paper 2002/62. United Nations University World Institute for Development Economics Research (UNU/WIDER). Retrieved from: http://www.wider.unu.edu/publications/publications.htm

Piatkowski, M. (2003). Does ICT Investment Matter for Output Growth and Labor Productivity in Transition Economies? *TIGER Working Paper Series*, *No. 47*, Warsaw. Retrieved from: www.tiger.edu.pl

Piatkowski, M. (2004). The Impact of ICT on Growth in Transition Economies? *TIGER Working Paper Series*, *No. 59*, Warsaw. Retrieved from: www.tiger.edu.pl

Piatkowski, M. (2005). *The Potential of ICT for the Development and Economic Restructuring of the New EU Member States and Candidate Coutries*. Washington D.C., USA: IMF and TOGER

Piatkowski, M. and van Ark, B. (2005). ICT and Productivity Growth in Transition Economies: Two-Phase Convergence and Structural Reforms. *TIGER Working Paper Series, No. 72*, Warsaw. Retrieved from: http://www.tiger.edu.pl/publikacje/TWPNo72.pdf

Piech, K. and Radosevic, S. (2006). *The Knowledge-based economy in central and east Europe: Countries and Industries in a Process of Change*. London, UK: Palgrave.

Radosevic, S. (2009). Research and Development, Competitiveness and European Integration of South Eastern Europe. *Europe-Asia Studies, 61*(4), 621-650.

Radosevic, S. and Stancova, K.C. (2015). *External dimensions of smart specialization: Opportunities and challenges for trans-regional and transnational collaboration in the EU-13*. S# Working Paper Series, No 09/2015.

Van Ark, B. et al. (2002). *ICT Investment and Growth Accounts for the European Union, 1980-2000*. GGDC Research Memorandum GD-56, Groningen Growth and Development Centre, revised March 2003. Retrieved from: http://www.ggdc.net/index-publ.html#top

Van Ark, B. and Piatkowski, M. (2004). Productivity, Innovation and ICT in Old and New Europe. Research Memorandum GD-69, Groningen Growth and Development Center, March. Retrieved from: http://www.ggdc.net/pub/online/gd69(online).pdf

Schlechtendahl, J. et al. (2015). Making existing production systems Industry 4.0-ready. *Production Engineering 9,* 143–48.

Stiroh, K. (2002). Information Technology and the U.S. Productivity Revival: A Review of the Evidence. *Business Economics, XXXVII* (1), 30-37. Retrieved from: http://www.ny.frb.org/rmaghome/economist/stiroh/ks_busec.pdf

Szalavetz, A. (2000). Adjustment of Hungarian engineering companies to the globalising corporate network. In Z. Bara and L. Csaba (Eds.) *Small economies' adjustment to global challenges* 8357-376). Budapest, Hungary: Aula Publishing

Szalavetz, A. (2002). The *Tertiarization of Manufacturing Industry or the Role of ICT in the Second Phase of Restructuring. The 'New Economy' and Old Problems*. Prospects for Fast Growth in Transition Economies, March 14 – 15, Warsaw. Retrieved from: www.tiger.edu.pl

Zhen-Wei, C.Q and Pitt, A. (2003). *Contribution of Information and Communication Technologies to Growth.* Washington, USA: World Bank.

Zhou, K. et al. (2015), Industry 4.0: Towards future industrial opportunities and challenges. Paper presented at *2015 12th International Conference on Fuzzy Systems and Knowledge Discovery (FSKD*), Zhangjiajie, China, 2147–52.

САВРЕМЕНЕ ТЕХНОЛОГИЈЕ КАО ДЕТЕРМИНАНТА ОДРЖИВОГ ЕКОНОМСКОГ РАСТА И РАЗВОЈА МАЛИХ ОТВОРЕНИХ ЕКОНОМИЈА

– Потенцијали, изазови и могући одговори –

[1] Радомир Божић, Универзитет у Источном Сарајеву. Економски факултет Пале, Босна и Херцеговина

САЖЕТАК

Савремено доба карактерише снажан развој и примјена информационо-комуникационих технологија (ИКТ) и Индустрије 4.0, које детерминишу значајне промјене у економији и друштву у цјелини, а посебно утичу на производне и пословне процесе, економски раст и развој, продуктивност, пословне моделе, потребне квалификације и вјештине радника, образовни систем, као и свакодневни живот људи. Захваљујући томе развијене земље већ остварују значајне ефекте у домену ефикасности, продуктивности, флексибилности, раста бруто домаћег производа (БДП) и животног стандарда, а постоје могућности и за мале отворене економије да креирају властите приступе у циљу убрзања раста и конвергенције са развијеним земљама. У супротном су могуће и негативне посљедице познате као дигитална подјела.

Циљ овог рада је да, на основу релевантне литературе и искустава појединих земаља, презентује потенцијале, изазове и могуће одговоре креатора економских и пословних политика усмјерене на примјену ИКТ и Индустрије 4.0 у малим отвореним економијама, какве су и земље Западног Балкана.

Рад је структуриран на сљедећи начин: *Уводне напомене* - елаборација теоријске основе, карактеристика и импликација ИКТ и Индустрије 4.0 на економију и друштво у цјелини; *Методологија* – преглед релевантне актуелне литературе; *Резултати* – презентовање основних потенцијала, изазова и могућих одговора малих отворених економија у функцији убрзања економског раста; и *Дискусија* – закључна разматрања и препоруке за могуће одговоре.

Кључне ријечи: *ИКТ, индустрија 4.0, иновације, економски раст, продуктивност, пословни процеси и модели, мале отворене економије*

PREREQUISITES FOR ACCOUNTING SUPPORT IN APPLYING DIFFERENTIATION STRATEGY

1 Predrag Gajić, Faculty of Economics, University of Banja Luka, Bosnia and Herzegovina
*Corresponding author E-mail: predrag.gajic@ef.unibl.org
1 ORCID ID: 0000-0003-2144-4957

ARTICLE INFO

Review Scientific Paper
Received: 23.11.2020.
Revised: 01.04.2021.
Accepted: 16.04.2021.

doi 10.7251/ACE2134113G
UDC
347.728.1.028:[005.51+657.5

Keywords: *competitiveness, competitive strategy, management accounting, quality costing, feature costing, target costing, activity based costing*

JEL Classification: M41

ABSTRACT

The paper is based on the thesis that the company competitiveness should be built on the basis of accounting support to strategic choices. Competitiveness at the single company level is, for the most part, a consequence of management activities. More recently, modern management concepts are available to them, which also require adequate information support. Hence, the content of the defined topic was intended to present the possibilities of accounting information support in achieving and measuring competitiveness, as identified based on customer attitudes about the key factors for company's market success. Achieving such an aim would contribute to identifying the criteria of accounting information system success in achieving desired market position, but also in promotion, to a great extent neglected possibilities of this part of information system, in domestic companies. Required adequacy of information support is presented in the form of accounting instruments which can help in setting and implementing differentiation strategy.

1. INTRODUCTION

The question: "how to be competitive" or "how to be better than others" in satisfying needs for products or services, is occupying the thoughts of economists for centuries. In conditions of globalized market and growing offers of different products and services, which satisfy needs of their users in a same or similar way, the competitiveness concept gets additional importance. This is exactly why one starts from the standpoint where the competitiveness is "the requirement of survival and the prosperity of the company" (Malinić, 2013, p. 50).

Subject of this research is related to one of the key assumptions of competitiveness of companies as market participants: accounting support to the managers, especially in implementing differentiation strategy. The key factors of market

success have been identified in theory and practice. Based on them, new management concepts have emerged, and those concepts require an adequate information support, so the paper will present the accounting instruments that should provide that support.

2. LITERATURE REVIEW

In economic terms, competitiveness can be viewed from different points of view: from the point of view of multinational associations, national economies, regions, firms and from the point of view of individuals. Individual levels are interdependent, which makes the analysis and achievement of competitiveness assumptions, a very complex problem.

The issue of competitiveness was initially treated from the point of view of the national economy, in the form of absolute and comparative advantages that one nation has compared to others. These benefits have been found in natural resources, capital and people. Over time, with the development of transport connections, technology, communication tools and other forms of globalization, competitiveness was sought at the level of individual companies who began to prove their competitiveness in a growing market and whose regulation and functioning characteristics became more and more standardized. As measures of competitiveness at the level of an individual company, the size of market share, profitability, amount of comparable costs and productivity are commonly used. Also, this successfulness or competitiveness is nowadays measured by the results related to compliance with the standards regarding social responsibility, environmental protection, working conditions of employees and the like.

2.1. Conceptual assumptions of company competitiveness

The issue of companies' competitiveness is a matter of its strategic choices. By choosing a way in which the company will oppose the competitors, the so-called competitive or business strategy and basic direction in investing limited funds will be defined. In that sense, companies use generic strategies (Porter, 1985) that should enable a firm to compete on the basis of: a) differentiation leadership in a way of meeting the needs of products and services users, b) cost leadership and c) focusing on the needs that no one satisfies (manufacturer or service provider within a small market segment - the so-called niche). Also, for different markets companies "may choose the combination of different strategies" and in that way achieve strategic positioning (Drury, 2012, p. 581).

The basis of competition has changed over time, with continues upgrade of previously identified prerequisites of competitiveness (see figure 1), by which a growing satisfaction of customer needs was verified. This growing satisfaction should enable customer loyalty, i.e. company's long-term competitiveness.

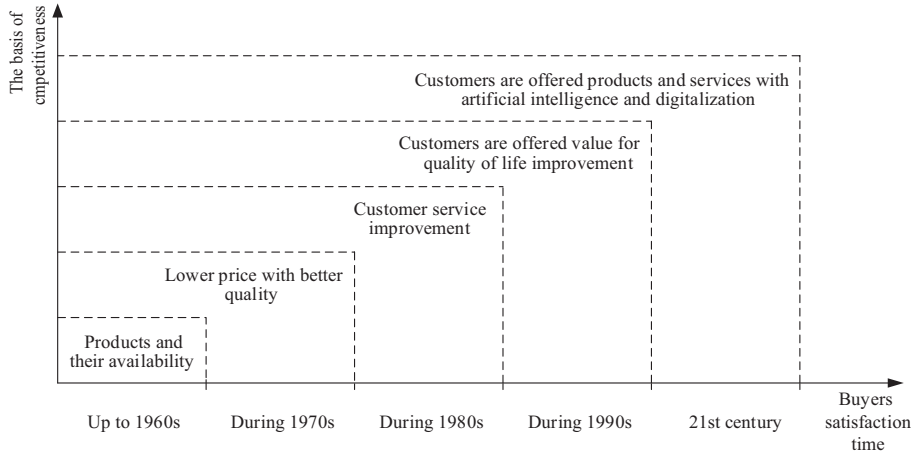


Figure 1. Evolution in the elements of competitiveness.
Source: Gajić, 2017, p. 80

There are many factors that affect the customer satisfaction and loyalty. However, there is sufficient evidence and consistent views that relevant factors for selection of products and services could be systematized into so-called key success factors for individual product and service providers, based on buyer's wishes. There are also different ways in defining key success factors. For example, Miller and Roth identified eleven competencies for achieving competitive advantage: consistent quality, reliable delivery, high-performance products, fast delivery, low-cost offerings, introducing new products or fast changes in design, offering of wide range of products, advertising i.e. effective promotion, broad distribution, fast volume change and after sales services (Miller & Roth, Manufacturing Strategies, Operations Management Review, 1988, pp. 8–20, as cited in Juran & Gryna, 1999, p. 84); Hansen, Moven, & Guan state that quality, flexibility, and cost-effectiveness are fundamental principles of the global level of competitiveness (Hansen, Mowen, & Guan, 2009, p. 766), Melnik & Denzler define quality, delivery, flexibility and cost as key drivers of market success from a customer perspective (Melnyk & Denzler, Production Operations Management. Irwin. Chicago. 1996, as cited in Fredendall & Hill, 2001, p. 28), while for some authors, simultaneously management and accounting instruments can be found as competitive prerequisite (Dunk, 2012). According to the most cited authors from

management accounting field, Colin Drury and Charles Horngren, key success factors are: quality, time, innovations and costs (Drury, 1996, p. 23; Horngren, Foster, & Datar, 2000, p. 8).

These views are supported by domestic market research (Gajić, 2010, pp. 379 - 407). The research was carried out for three types of products: products that belong to basic low-value consumer goods (milk), products that are subject to seasonal purchases (winter jacket) and to luxury goods, that is, products that are purchased only a few times over the lifetime of the buyer (car). In order to identify the key factors of competitiveness, the criteria by which buyers make their purchase choices were identified. The total number of different criteria for the analyzed products is: for milk - 30, for winter jacket - 29, and for car - 36. It was concluded that each of the product selection criteria can be classified into the following categories, which were considered as key factors of market success, known also as competitive factors[1]:

1) Quality - characteristics of product usage value and production and sale of products without making errors or failures in the process;
2) Time - customer needs are quickly met (external context), and the entire process of preparation, production and delivery takes place quickly and without time waste (internal context);
3) Innovation - applied novelty in characteristics that affect product attributes (product innovations) or ways of its production (process innovations), and in ways customer needs are met, but also those changes that affect the cost of meeting customer needs;
4) Cost - as a characteristic of competitiveness, this key success factor implies that all three previous elements are provided at low cost so that the price of the product or service that is determined on the basis of these costs is competitive.

It is clear that the costs have a direct impact on business results, but at the same time they are a common feature of all key success factors. Regardless of the way in which the market strategy is defined and on which key factors of market success it is based on, efficiency in the use of resources, as measured by the amount of costs, is an inevitable competition factor. However, due to the objectives of this research, further attention will be focused on other factors of market success, as a general base for differentiation strategy.

1 The relative share of the "other" buying criteria in the total number of criteria for analyzed three products allows for them to be considered irrelevant and, according to consumer behaviour theory, are considered irrational and cannot be treated as universal assumptions of competitiveness.

2.2. The impact of accounting support on achieving competitiveness

Traditionally, accounting and the tools at its disposal have been perceived as means of recording the consequences of business transactions, with the key task of achieving a clear understanding of the value of scarce resources used (costing) and the economic and non-economic effects (measuring results) of such resource consumption. Over time, with the development of the management profession and various management techniques, accounting is first asked for help with tactical and then strategic decisions about how to manage these scarce resources.

The lack of adequate accounting support for strategic management and achieving competitiveness was exactly the basis for a critical approach to the content of accounting reports, which was especially emphasized in the second half of the 80s and early 90s of the twentieth century. Johnson and Kaplan's conclusion from 1987, that management accounting lacks innovative content that would adequately take account of changes in the business environment has been confirmed by later research (Drury, 1996; Bromwich and Bhimani, 1989, 1994). Criticisms were especially related to: the need to take into account the changed structure of production costs and diversification of offerings, which is why traditional production cost accounting systems provided misleading information for decision making purposes; the view that conventional management accounting practices are identified only as a means of supporting the reporting needs of external users of accounting reports, while also completely ignoring the need for accounting treatment of the external environment within which the company operated.

Domestic practice studies[2] in this segment are not numerous and have not yielded positive results. Available domestic market research (for example, Gajić, 2011, pp. 127-152) indicates an insufficient use of traditional accounting support instruments for the management process. For example, only 40% of respondents know the data pertaining to activity level required for total business costs to be covered (data on the break-even point); only 31% of respondents in addition to the absorption costing for valuing stock of products (statutory calculation), also uses the variable costing (known to be more suitable for management needs); only 63% of respondents use the operating budget as a guideline for how to plan activities of a company; only 37% respondents calculate deviations from planned numbers, which significantly reduces the informative value of the plan itself; in 64% of companies the management makes a decision that is not based on accounting information.

2 Research conducted on Republic of Srpska companies.

Research conducted to identify the application of accounting instruments in the segment of the application of integrated cost management, with an emphasis on accounting support for strategic decisions (Lučić, 2016, pp. 61-87)[3] gives similar results. Practically none of the analyzed companies use modern cost accounting concepts and 53% of them use actual (real) absorption cost accounting, while the remaining companies use standard and standard variable cost accounting equally, which is consistent with the conclusion from the research presented earlier that costing which is better for managerial activities is insufficiently used. In the segment of aforementioned research, related to the modern methods of cost management, the cited author got the following results: two out of thirty companies from the relevant sample apply activity-based costing (7 apply it partially) and target costing (4 apply it partially) while the cost calculation according to the kaizen methodology (as an assumption for just-in-time costing concept) is not applied. However, in the conclusion of the obtained results, it is stated that "the application of conventional cost accounting systems in the surveyed companies is justified" (Lučić, 2016, p. 77).

However, there is no sufficient information on the national and international competitiveness of the analyzed companies (especially those that do not apply modern management and cost accounting concepts). The author justifies the use of conventional costing systems with the low level in the indirect cost and having business done in a low competitive environment (Lučić, 2016, p. 75). Still, if one assumes that the technological advancement and globalization are the two key assumptions of doing business in contemporary business conditions, while technological advancements implies the change in the structure of total costs towards indirect costs and globalization implies a serious exposure to competition, then one could indirectly conclude that the analyzed companies do not have the necessary "strength" from a competitive standpoint.

3. RESEARCH RESULTS RELATED TO ACCOUNTING SUPPORT FOR ACHIEVING COMPETITIVENESS

When defining the tasks of an accounting function in relation to achieving competitiveness, clear answers to the key questions should be given: when to prepare the information or the competitiveness report, how the reporting subject (competitiveness) will be defined, what source of information will be used and what is the specific content of the information or the competitiveness report (Figure 2).

3 Research conducted on a large production companies from Bosnia and Herzegovina.

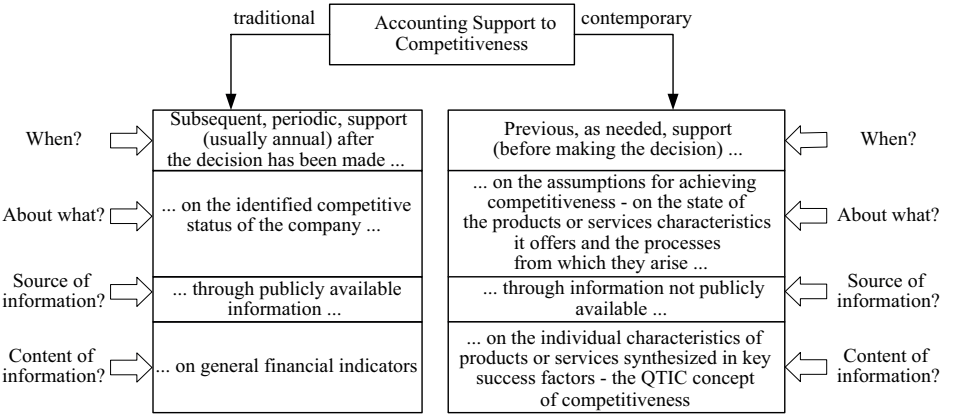


Figure 2. Assumptions for defining accounting support to competitiveness. Source: Author

Of course, these reports are not mutually exclusive, but rather dependent and complementary.

3.1. The concept of traditional and contemporary accounting support in measuring competitiveness

Traditionally, the accounting provides ex-post comparisons of historical performance in the competitive segment, based on publicly available information from the financial statements of competitors. There are several common indicators of competitiveness that can be viewed comparatively. For these purposes, suppose an example of comparative analysis for: company "ABC", a direct competitor (a company whose performances should be reached in a short-term), a potential competitor (a company whose results are close to those of "ABC") and a market leader, best company whose accomplishments everyone wants to reach (see Table 1).

For the analyzed company ("ABC") in 2019, sales revenue increased by 11.11% compared to the previous accounting period (indicator from row 4), but its market share decreased by 5.41% (indicator from row 7). Thus, while revenues have increased, the competitiveness of businesses, as measured by market share, has decreased. The importance of this indicator is even more emphasized when looking at the immediate and potential competitor, and the market leader, because they all have higher relative sales revenues growth than the analyzed company, and the potential competitor and market leader have also grows in market share. An increase in sales revenue does not lead to an increase in the competitive position of a company if the percentage of growth in the potential (size) of the market to generate sales revenue is greater than the percentage increase in sales revenue.

Table 1. Example of analysis of ABC's competitive position based on publicly available information

Elements of the analysis	Company "ABC"		Direct competitor		Potential competitor		Market leader		Market potential	
	Accounting periods		Accounting periods		Accounting periods		Accounting periods		Accounting periods	
	2018.	2019.	2018.	2019.	2018.	2019.	2018.	2019.	2018.	2019.
1. Sales volume	200 000	235 000	270 000	325 000	140 000	175 000	500 000	610 000	1 110 000	1 345 000
2. Change in sales volume	-	17.50%	-	20.37%	-	25.00%	-	22.00%	-	21.17%
3. Sales revenues	1 800 000	2 000 000	2 300 000	2 600 000	1 050 000	1 250 000	4 300 000	5 250 000	9 450 000	11 100 000
4. Change in sales revenues	-	11.11%	-	13.04%	-	19.05%	-	22.09%	-	17.46%
5. Average selling price	9.00	8.51	8.52	8.00	7.50	7.14	8.60	8.61	-	-
6. Change in aver. selling price	-	-5.44%	-	-6.09%	-	-4.76%	-	0.08%		
7. Market share in sales revenue	19.05%	18.02%	24.34%	23.42%	11.11%	11.26%	45.50%	47.30%	100.00%	100.00%
8. The ratio of market share to the sales revenue of competitors and "ABC"	-	-	1.28	1.30	0.58	0.63	2.39	2.63	-	-
9. Total cost	1 200 000	1 280 000	1 380 000	1 480 000	826 000	920 000	2 900 000	3 300 000	6 306 000	6 980 000
10. Change in total cost	-	6.67%	-	7.25%	-	11.38%	-	13.79%	-	10.69%
11. Average cost	6.00	5.45	5.11	4.55	5.90	5.26	5.80	5.41	5.68	5.19
12. Change in average cost	-	-9.22%	-	-10.90%	-	-10.90%	-	-6.73%		-8.65%
13. Operating result (3-9)	600 000	720 000	920 000	1 120 000	224 000	330 000	1 400 000	1 950 000	3 144 000	4 120 000
14. Relative change in operating results		20.00%		21.74%		47.32%		39.29%		31.04%
15. Profitability rate	33.33%	36.00%	40.00%	43.08%	21.33%	26.40%	32.56%	37.14%	33.27%	37.12%
16. Average unit profit (5-11)	3.00	3.06	3.41	3.45	1.60	1.89	2.80	3.20	-	-

Source: Author's calculation

As a result, the market position of the "ABC" company and its immediate competitor has deteriorated.

ABC's relative market share with respect to competition (indicator from row 8) is an indicator that will give a more accurate understanding of ABC's competitive position and prospects. It is the ratio of the market share of an individual competitor to the market share of "ABC".

According to the analyzed data, it can be concluded that the situation of the analyzed company has worsened with respect to all three competitors in the current accounting period, compared to the previous one. The difference in market share increases with respect to companies where the backlog was recorded in the previous accounting period (with respect to the direct competitor and market leader) and decreases with respect to potential competitor.

Also, the relative increase in the business results of the analyzed company is smaller compared to other competitors (indicator from row 14), where the data about the average unit profit indicates that direct competitor and market leader can further improve their competitive position by reducing sales prices and consequent increase in sales. The general conclusion in this segment is that an increase in the business result (for the analyzed company 20%) does not lead to an increase in the competitive position of the company if the percentage of growth of market potential is higher (as in this example: 31.12%).

The analysis of the competitive position of the analyzed company can be further supplemented by analysis and comparison of costs.

In this segment, it can be concluded that the reduction of average production costs per unit of product at the company "ABC" by 9.22% (indicator from line 12), does not strengthen its competitive position, because the percentage reduction in average production costs of direct and potential competitors is greater than the percentage reduction of the average costs of the analyzed company, and although the percentage reduction is higher than the market leader, the average costs of that company are still the lowest. A decrease in sales prices is evident in all companies, which suggests that all companies use a strategy of reducing sales prices to improve their competitive position. The analyzed company reduced the selling price by 5.44%, while the reduction of average costs was 9.22%, which is a better option than if the indicators were reversed.

In a way described above, the accounting report could enable conclusion on the competitive status of the analyzed company.[4]

4 The above example can be extended with more details, especially regarding global competitiveness indicators, such as: the rate of growth of foreign sales ratio and total sales, the growth of the rate of foreign and total sources of financing, and others.

In contemporary business conditions, a broader concept of measuring and comparing business results against competition is available. It shows business results in a more comprehensive way. Namely, the example above contains only financial indicators available from official financial statements. Information on sources of competitiveness is missing, which are generally "hidden" under non-financial performance indicators. For the purpose of identifying sources of competitive position and sources of competitiveness, Balanced Scorecard[5] is extensively used. It is an integrated set of measures linked in four specific perspectives for viewing results: the financial perspective (focused on results relevant to owners), the customer perspective (focused on customer satisfaction with wideness of supply and product or service characteristics), the internal processes perspective (especially those relevant to the core business, and those relevant to customers), and the learning and growth perspective (especially important from the point of view of the ability to adapt to external changes). The application of this concept implies that the managers, depending on the specifics of the companies they manage, select the measures that best suit their business needs, which can identify competitive strengths and weaknesses. These types of competitive performance indicators, apart from financial performance indicators, are not publicly available. They can mostly be collected on the basis of informal links, from joint buyers and sellers, creditors, employees of their own company, and from analysts and consultants from different segments of the competition. An example of one such set of indicators is given in Figure 3.

Results obtained by given measures (which of course are not exhausted by Example 2) may be subject to comparison with competitor's results.

In order to support the efficient management of key success factors, the accounting information system is also expected to have "ex ante" support. This would enable desirable integration of the information base preparation stage and the decision-making stages, since "actions must already be taken in the information evaluation process" (Bhimani & Bromwich, 2010, p. 105).

If the support of selection and implementation of a market strategy is done through accounting reports, then there are two basic directions. Namely, it was stated earlier that the factors of market success in contemporary business conditions are synthesized in quality of performance, reaction time to customer demands, offerings of innovative contents and costs, as a basis for defining the sales price. Companies that apply a differentiation strategy to competitiveness are based precisely on the first three factors identified, while cost-based strategies are primarily defined by the desire to offer customers a cheaper product or service over competition.

5 This concept was originally promoted by its authors (Kaplan & Norton, 1992, 71–79).

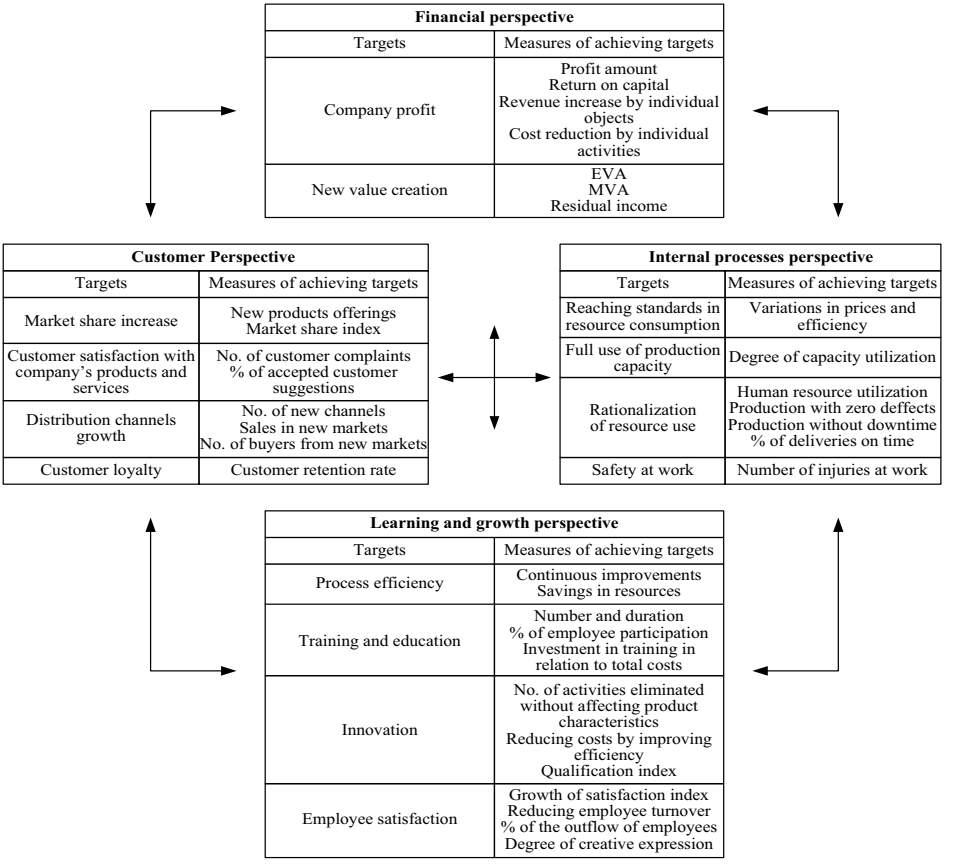


Figure 3. An example of a Balanced Scorecard. Source: Author

3.2. Concepts of contemporary accounting support to achieving competitiveness based on differentiation strategy

Differentiation strategy is possible to implement by acting on the key factors of market success: 1) quality, 2) time and 3) innovation.

(1) In order to ensure adequate quality management and competitiveness in this segment of competition, it is necessary that the accounting function successfully carries out the following activities:

- identify necessary activities for achieving characteristics that generate costs of quality,
- determine the types of quality costs and measure them,
- conduct measurements of effects of resources consumed in order to improve quality and

– adequately inform management on the costs and effects of quality improvement.

In the simplified review (Table 2) a possible layout of the cost of quality report is given. The given review provides information on what activities cause quality costs (prevention, control (or measurement), internally and externally identified defects), how are the individual quality costs grouped, what are the costs of individual activities, and all for two consecutive periods relative to the target cost amount.

The knowledge of provided information will allow the management to more easily plan, control and make decisions regarding the quality of products and services which the company markets. Another important use of quality cost reports is to monitor the amount of quality costs that track the expected cost savings foreseen by the introduction of the quality improvement program. Also, what is particularly important is that the company improves the structure of total costs of quality, since the costs of preventive and measurement activities increase relative to the costs of errors (whether internally or externally stated), based on the principle of investing in preventing defects and costs rather than correcting and covering them. For example, the share of costs of externally identified defects in total costs is decreasing (from 28.13% in 2018 to 22.52% in 2019). It also means that the number of defects that "reached" customers is reduced, which is the most disastrous from the point of view of the market image of the company.

(2) When competition is based on time, or rather the speed of meeting customer needs, it is done by: faster introduction of new products and faster delivery of existing products or services to customers.

In contemporary business conditions, faster introduction of new products or services is achieved by respecting the needs and wishes of customers, and by cooperation of individual functional areas within the company. Operationally, the entire process must be supported by innovation in products and services, in production technologies, as well as with appropriate information tools to assist in the creation and processing of databases, simulating various options in the product design and engineering phases. For this reason, the description of accounting support for such a market-based strategy is usually presented in the segment concerned with innovation-based competitiveness, either in processes or in products and services.

The time of delivering the existing products or services to customers consists of: order receipt time, manufacturing cycle time and delivery time (see figure 4).

Table 2. Example of the cost of quality report

Types of costs	Results in 2019 (in KM)			Results in 2018 (in KM)			Difference in actual results	Target costs for 2024	Variances from target costs
	actual	planned	variance	actual	planned	variance			
	(1)	(2)	(3) = (2) - (1)	(4)	(5)	(6) = (4) - (5)	(7) = (1) - (4)	(8)	(9) = (1) - (8)
Examples of prevention costs:									
- quality planning	60 000	63 000	3 000 (F)	64 000	62 000	2 000 (U)	4 000 (F)	45 000	15 000 (U)
- training	110 000	105 000	5 000 (U)	113 000	108 000	5 000 (U)	3 000(F)	88 000	22 000 (U)
- certification	25 000	22 000	3 000 (U)	28 000	24 000	3 000 (U)	3 000 (F)	23 000	2 000 (U)
Total	**195 000**	**190 000**	**5 000 (U)**	**205 000**	**194 000**	**11 000 (U)**	**10 000 (F)**	**156 000**	**39 000 (U)**
Examples of control costs:									
- input control	19 000	18 000	1 000 (U)	23 000	21 000	2.000 (U)	4 000 (F)	12 000	7 000 (U)
- process control	77 000	74 000	3 000 (U)	70 000	70 000	0	7 000 (U)	65 000	12 000 (U)
- output control	14 000	13 000	1 000 (U)	19 000	20 000	1.000 (F)	5 000 (F)	10 000	4 000 (U)
Total	**110 000**	**105 000**	**5 000 (U)**	**112 000**	**111 000**	**1.000(U)**	**2 000 (F)**	**87 000**	**23 000 (U)**
Examples of costs of internal defects:									
- spoilage	35 000	28 000	7 000 (U)	39 000	32 000	7 000 (U)	4 000 (F)	15 000	20 000 (U)
- repairs	20 000	0	20 000 (U)	26 000	0	26 000 (U)	6 000 (F)	20 000	0
- repeated measurement	15 000	0	15 000 (U)	14 000	0	14 000 (U)	1 000 (U)	5 000	10 000 (U)
Total	**70 000**	**28 000**	**42 000 (U)**	**79 000**	**32 000**	**47 000 (U)**	**9 000 (F)**	**40 000**	**30 000 (U)**
Examples of costs of external defects:									
- warranty costs	40 000	31 000	9 000 (U)	60 000	49 000	11 000 (U)	20 000 (F)	0	40 000 (U)
- out of court settlement	55 000	48 000	7 000 (U)	70 000	40 000	30 000 (U)	15 000 (F)	0	55 000(U)
- reparations	14 000	8 000	6 000 (U)	25 000	15 000	10 000 (U)	11 000 (F)	0	14 000 (U)
Total	**109 000**	**87 000**	**22 000 (U)**	**155 000**	**104 000**	**51 000 (U)**	**46 000 (F)**	**0**	**109 000 (U)**
Total cost of quality	**484 000**	**410 000**	**74 000 (U)**	**551 000**	**441 000**	**110 000 (U)**	**67 000 (F)**	**283 000**	**201 000 (U)**
Percentage of share of individual types of quality costs in total quality costs:									
- prevention costs	40.29%	46.34%	-	37.21%	43.99%	-	-	55.12%	-
- control costs	22.73%	25.61%	-	20.33%	25.17%	-	-	30.74%	-
- costs of internal defects	14.46%	6.83%	-	14.34%	7.26%	-	-	14.13%	-
- costs of external defects	22.52%	21.22%	-	28.13%	23.58%	-	-	0.00%	-
Total revenue	5 000 000	4 900 000	-	4 500 000	4 300 000	-	-	7 500 000	-
Share of quality costs in total reven.	9.68%	8.37%	-	12.24%	10.26%	-	-	3.77%	-

Source: Author's calculation

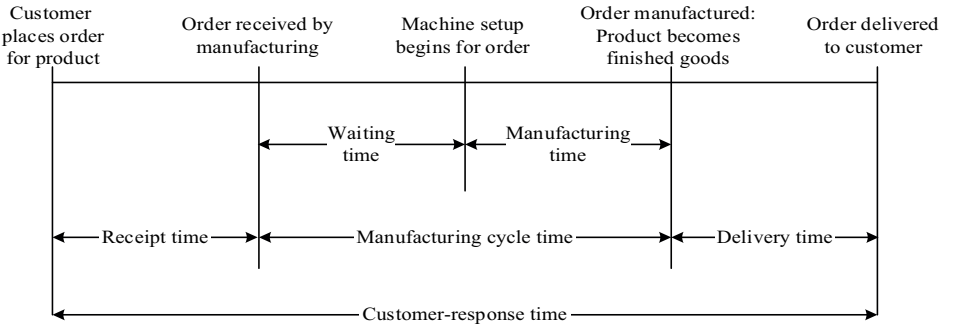


Figure 4. Components of customer response time
Source: Horngren, Datar, & Rajan, 2015, p. 745

Faster delivery of existing products or services to the customers is achieved by applying total quality management concepts and procedures based on the "just-in-time" (JIT) concept. The impact of the concept of total quality management on the time management is clear: the fewer defects in products and the fewer products that do not meet the product-specific criteria, the less time it will take to correct these deficiencies and the less time it will take to "retake" the market and customers, who are "lost" because of these shortcomings. The basics of accounting support for the concept of quality-based competitiveness have been briefly outlined previously.

Also, the "just in time" concept can significantly reduce the time that does not add to the new value of a product or service, especially the time it takes for products to go from raw material through the entire production process to finished products. In such a concept, it is the responsibility of the accounting information system to identify time that does not contribute to the new value of the product (service), with particular attention being paid to inventory management, as a traditional factor that adversely affects time consumption and also the liquidity and solvency of a company. This approach provides significant cost savings by reducing inventory levels, and the ultimate goal of the concept is to convert the row material into finished products over a cycle time equal to the processing time of the product, thus eliminating time or activities that do not add new value to the product.[6]

6 One of the precise empirical studies of the concrete benefits of applying this concept of inventory management, for the four companies analyzed, is the following (Kanji & Asher, 2006, 50):

Company	Inventory reduction	Reduction in time losses	Reduced reprocessing	Reduction of required storage space
A	94 %	95 %	50 %	40 %
B	82 %	95 %	51 %	70 %
C	75 %	92 %	37 %	58 %
D	94 %	70 %	75 %	40 %

According to this concept, all activities are aimed at reducing the quantity and thus the value of the stocks, establishing closer relations with suppliers, which should provide smaller quantities of purchases but at shorter intervals and with customers who need to receive finished products without their prior storage in the company. Both goals must be achieved in the form of so-called strategic partnership of all participants in the supply chain who deliver the product to the end user. For the purposes of that strategic partnership, the key responsibility of the accounting function is that for a fixed period of time - for example between one and three months in advance, delivery schedules are defined, to allow the cost and revenue centers, but also buyers and suppliers, to determine their own schedules, thereby significantly increasing the accountability and importance of accounting planning. The precision of such schedules implies that all value flows in the enterprise, as well as all the processes, are harmonized internally, within the enterprise, as well as at the level of the supply chain of which it is an integral part.

Due to the fact that inputs are received from suppliers only in quantity and at the time when they are required for production, the manufacturer does not create the inventories of inputs. This means that the accounting planning depends on the accuracy of time for which individual activities are anticipated and the quality of process inputs obtained, but firstly on the timing and volume of requested outputs from customers, since the entire process of creating and delivering to customers is initiated by them.

While supporting the process of time management, accounting reports should identify the chronology of the business process and the time required of each individual activity of that process. Therefore, cooperation with the managers of individual functional areas is necessary, since it is important to measure the time spent on individual activities performed. Also, it is important to separate those activities and time spent on them, which occur without contributing to the value for customers. This applies to all activities that take place in internal value chain, but also in the customer supply chain (external value chain). This would create an informational basis for reducing redundant activities, synchronizing available resources with the time needed to adequately meet customer needs, and reducing total time in a supply chain, which are undoubtedly effects that will give the accounting support a strategic importance, and contribute to the competitiveness of the company.

Common instruments for measuring customer response time are:

- Manufacturing Lead Time - the time between receipt of the order in the sales department and delivery of the ordered to the customer,

- Throughput Time - the time between the receipt of an order in production and the completion of a product or batch, during which following activities are done: processing of inputs, movement or manipulation of resources and work equipment, waiting time for the next stage of the process and the control time of the products and processes,
- Manufacturing cycle efficiency - calculated as a ratio of product production time to the total production cycle time; whereby this indicator should be as close to number 1, as the rest of the time does not add to the new value for customers,
- Takt Time – the ratio of available production time and the number of units required, whereby this indicator has a particularly important use in cases where the company has a limited capacity and in cases where the order relates to different products.

Of course, to the extent possible, given the internal character of this information, the values obtained should be compared with competitor's results, in order to obtain clear information on what is the competitive status of the company.

(3) Although they can also be seen as cost-cutting activities, the innovations of products and services and processes are seen as activities undertaken to implement a differentiation strategy. Namely, the goal of innovation is novelty in the process of product preparation, its distribution, sales, use, appearance, functional characteristics, etc. Basically, it is about continually adjusting to customer requirements to win and preserve their affection.

The accounting function should help to identify the economic viability of investing in innovative contents by comparing the costs and effects expected from such investments. For this purpose, conventional differential value analyses within the cost-benefit concept is used, which should be made in advance, already in the design phase of such innovative contents.

Contemporary accounting support for innovation processes starts from the assumption that it begins from the market price for the product or a service that is offered to customers. In this context, the concept of "target cost" is used as a key accounting tool. Unlike the traditional approach to innovation, when the price of an end-product or service is identified at the end of the innovation process, the concept of target cost starts with a price which is already defined by the market. The increased competition leads to the fact that price as a mechanism of competition is taken as a given, limiting, known factor. This is especially true in the production of consumer goods or services, which are under greater pressure from competitors. Assuming that the owners also have a predefined yield that they hope for and that it is also taken as a given data, the only thing left to the manag-

ers is to influence the cost. The design process, engineering and trial production process is repeated until the target cost is reached.

Key elements of accounting support for the management process in this segment are:

- preparing reports on activities or product/service characteristics that add value to the customer and those which do not,
- preparing information on costs and effects based on initial and corrected ideas and blueprints,
- a review of the costs incurred by planned activities or characteristics, indicating areas where costs have been reduced and where there has been no progress,
- determining the difference between actual (current) or assumed and target costs,
- participation in the development of an information system that should efficiently support the introduction of this calculation, but also the operational process of continuous improvement and reduction of costs in the later stages, once production has started and
- preparation of analysis for the possibly necessary capital investments.

To illustrate, suppose an example (Table 3) of target costing for a company that manufactures and sales cars, and is considering the introduction of a new model.

Table 3. Example of target costing

Target costing at the product level (in KM)	
Sales Price - defined by the market (for models with similar characteristics)	44 460
Selling price (net, excl. 17% VAT)	38 000
Target unit operating profit (20% of market sales price)	8 892
Overhead allocated per unit of product	2 108
Target production costs	27 000
Anticipated costs	31 400
Difference (cost reduction required)	4 400

Source: Author's calculation

Thus, the anticipated unit cost should be reduced by 4 400 KM and compressed to the target level. If analysis is performed by components, the target cost would be determined for each component. Taking into account the previously identified importance of the individual components for customers, an overview of the required reduction by components could be as presented in Table 4.

Column 1 presents an index of the importance of components or product characteristics, which is calculated as the sum of the results of multiplication of the

relative importance of each element of the quality – time – innovation - costs concept of competitiveness (as ranked by customers) and the contribution of each component to an individual element of the quality – time – innovation - costs concept of competitiveness.[7] Column 2 presents the estimated costs per component of the product under design; while column 3 calculates the proportion of individual cost values per component in the total estimated costs. Under column 4, it is possible to identify which components should be sought for cost reduction options regarding the fact that the buyers treat some components less important in relation to the relative cost share of those components in the total cost. Product components where the indicator in column 4 is greater than 1 indicate that this component causes more costs in relation to its importance for the customer. Indices with a value greater than 1 show excessive costs. According to the obtained indicators, the company by its investment in "electronics", overestimates its importance from the point of view of the customer by 76%, while the investment in "braking mechanism", underestimates its importance for the customers by 45%, etc. Column 5 presents the breakdown of target costs by individual components with the help of the degree of importance of the specified components for the customers, in order to obtain also the nominal amounts of the required cost reduction by individual components in column 6.

Table 4. Example of target costing – cost reduction by components

Product Components	The degree (index) of importance of the individual component for customers	Anticipated costs (in KM)	The relative participation of costs of a component in total cost	Ratio of a relative share of costs by components and index of importance	Breakdown of target costs on individual components (allowable costs)	Needed cost reduction by component
	(1)	(2)	(3) = (2) / 31 200	(4) = (3) / (1)	(5) = (1) x 27 000	(6) = (2) – (5)
Engine	18.16%	6 400	20.38%	1.12	4 903	1 497
Transmission mechanism	13.44%	4 000	12.74%	0.95	3 629	371
Braking mechanism	20.40%	3 600	11.46%	0.56	5 508	-1 908
Chassis	16.52%	4 500	14.33%	0.87	4 460	40
Electronics	10.76%	5 900	18.79%	1.75	2 905	2 995
Comfort	10.72%	4 200	13.38%	1.25	2 894	1 306
Other features	10.00%	2 800	8.92%	0.89	2 700	100
Total	100.00%	31 400	100.00%	1	27 000	4 400

Source: Author's calculation

7 These data were taken from the survey done by: Gajić, 2010, p. 402.

Given that it has previously been stated that the key factors of market success are essentially interrelated and formally linked by the cost component, individual accounting support instruments of management can also be viewed in relation to each other, or uniquely. The basis for this uniqueness lies in the fact that each of the factors of market success will have a different influence on the buyer's decision. In doing so, the relative relationships of these factors must be identified for each individual product or service in order to understand the importance of the individual characteristics. This will further enable the resource management based on the importance of the individual characteristics of the products or services, and each enterprise, or its customers, will identify the specific importance of the individual factors from the point of view of the specific activity the enterprise performs (as shown in Table 4).

Companies that are strategically focused on diversifying their product or service range, that is, gaining a competitive advantage based on differences in the characteristics of the products and services they offer, need to identify the value of resources spent and revenues generated based on individual characteristics of the product and service, especially those on which competitive advantage is being built upon and realized. Accounting treats the product characteristics as cost drivers. Each individual characteristic (attribute) must be analyzed in the form of a cost / benefit ratio, and the results obtained are compared with the customer expectations and the index of importance of the individual characteristic for the customers.

From an accounting standpoint, this assumption is covered by cost calculation based on product features or attributes (Feature Costing). In doing so, elements within the key success factors would be considered as individual features or attributes. The calculation is based on the premise that management should manage the product features, which make the unique value delivered to the customer. The concept was introduced as a continuation of the activity-based costing idea. Each activity is viewed from the standpoint of the product characteristics that the activity seeks to achieve, with the aim of identifying the cost behind the defined product characteristic, since the basis of competitive advantage in the market is identified through individual product characteristics. Such a procedure would mean a simpler assumption of strategic planning and determination of the focus of business policy at the stage when defining how to allocate scarce resources.

4. DISCUSSION AND CONCLUSIONS

In contemporary business environment, a key competitive assumption will be brought down to the ability of information systems to provide a better basis

for making adequate decisions about how to implement competitive strategies. To this end, some of the key accounting support instruments for managing key factors of market success, that is, competitiveness, are presented. The thesis presented in the paper is that competitiveness must be based on the key success factors (quality-time-innovation-cost concept), which precisely fit into two basic generic strategies: the strategy of leadership in diversity and the cost leadership strategy. Without appropriate accounting support companies can operate only within markets niches, dominantly determined by market imperfections, such as: lack of healthy competition, inadequate customer information and the like.

The fact that some modern accounting tools are expensive or complicated to apply, such as activity-based accounting, does not mean that they cannot or may not be applied, especially if one knows that the original assumptions of the model have changed (see Kaplan & Anderson, 2004). A key limitation in this regard relates to the ability to perform an accurate cost-benefit analysis of the application of instruments that accounting offers. Also, the findings that "traditional costing systems meet the costing objectives" are not acceptable without identifying the current competitive status of the company, in which segment the appropriate tools are also offered.

On the other hand, on the way to achieving competitiveness, it is also very important a managerial vision of competitiveness, whether adopted as a formal or informal basis for defining the goals of a company. If management activities are undertaken to achieve local and short-term goals, this cannot lead to competitiveness, even at that local level. Therefore, investments in the development of an accounting system must be of strategic importance for the company, because the problem is not whether the existing system meets current needs, but whether it is possible to be better than competitors on the basis of additional information, currently and in the future.

The presented concepts of accounting support for management used in order to achieve competitiveness in the market are of microeconomic character in nature, intended for individual companies whose product or services are subject to opposition in the globalized market. With stable macroeconomic assumptions, which are assumed by the given analyzes, they can contribute to better resource management both in tactical (operational) and strategic terms, and consequently in better business results. The answer to the question whether they belong to strategic or operational tools to support managerial activities will depend on how the individual instrument is used. For example, the use of activity-based costing as a concept to support a product range decision at the stage where the production line is installed can support tactical decisions, while at the stage of production

line selection it can have strategic importance and directly affect the competitiveness of the company.

Because of all that has been stated above, individual market strategies must be clearly defined and persistently implemented on the basis of appropriate accounting tools. Likewise, individual accounting tools, although presented separately by different market strategies, have multiple utility values in terms of supporting management activities that affect competitiveness. For example, the use of activity-based costing will allow appropriate assumptions for more accurate determination of unit costs, as well as the ability to better manage quality costs, which will further affect the ability to meet customer needs faster and identify the needs and opportunities for development innovative contents in products and services or processes. Similarly, identifying and calculating quality costs will reveal the types and extent of resources that are generated without (or without sufficient) effects on customer value added, and so on.

Without modern accounting concepts of recording resource spending, its calculation and without measuring the effects of resource spending, it will not be possible to achieve adequate information support to managers, and therefore to achieve satisfactory competitiveness based on differentiation strategy. Because of that the future of the management-oriented segment of the accounting information system will depend on the ability to offer adequate support in achieving the companies' competitiveness, as evidenced by actual accounting trends (Cokins, 2013).

REFERENCES

Bhimani, A. & Bromwich, M. (2010). *Management Accounting: retrospect and prospect*. Oxford, UK: Elsevier.

Bromwich, M. & Bhimani, A. (1989). *Management accounting: Evolution not Revolution*. London, UK: CIMA.

Bromwich, M., & Bhimani A. (1994). *Management accounting: Pathways to Progress*. London, UK: CIMA.

Cokins, G. (2013). *Top 7 trends in Management Accounting*. *Strategic Finance 12,* 21-29. Retrieved from: https://sfmagazine.com/wp-content/uploads/sfarchive/2013/12/Top-7-Trends-in-Management-Accounting.pdf

Drury, C. (1996). *Management and Cost Accounting* (4th ed.). London, UK: International Thompson Business Press.

Drury, C. (2012). *Management and Cost Accounting* (8th ed.). Andover, Hampshire, UK: Cengage Learning EMEA.

Dunk, A.S. (2012). Assessing the contribution of product life cycle cost analysis, customer involvement and cost management to the competitive advantage of

firms. *Advances in Management Accounting, 20,* 29-45. Doi:10.1108/S1474-7871(2012)0000020008

Fredendall, L. D., & Hill, E. (2001). *Basics of the Supply Chain Management.* Florida/ Alexandria, Boca Raton USA: The St. Lucie Press/APICS Series on Resource Management.

Gajić, P. (2017). *Upravljačko računovodstvo - strategijski aspekti računovodstvene podrške upravljanju ključnim faktorima uspjeha*. Banja Luka, Bosna i Hercegovina: Ekonomski fakultet Univerziteta u Banjoj Luci.

Gajić, P. (2011). *Izazovi upravljačko – računovodstvene funkcije u promijenjenim uslovima poslovanja*. *Zbornik radova sa 15. Kongresa SRRRS - Refleksije međunarodnih standarda finansijskog izvještavanja na računovodstvo, reviziju i poslovne finansije*, 127-152, Banja Luka, Bosna i Hercegovina: Savez računovođa i revizora Republike Srpske. UDK 336.763.1:657.6, ISBN 978-99938-840-6-4.

Gajić, P. (2010). *Model računovodstvene informacione podrške upravljanju ključnim faktorima tržišnog uspjeha preduzeća, Zbornik radova sa 14. Kongresa SRRRS - Uloga finansijske i računovodstvene profesije u prevazilaženju krize u realnom i finansijskom sektoru*, 379-407, Banja Luka, Bosna i Hercegovina: Savez računovođe i revizora Republike Srpske. UDK 336.76:004, ISBN 978-99938-840-5-7.

Hansen, D. R., Mowen, M. M., & Guan, L. (2009). *Cost Management: Accounting & Control*. (6th ed.). Mason, USA: South-Western, Cengage Learning.

Horngren, T. C., Foster G., & Datar M. S. (2000). *Cost Accounting - a Managerial Emphasis* (10th ed.). Upper Saddle River. New Jersey, USA: Prentice Hall International, INC.

Horngren, T. C., Datar, M. S, & Rajan, M. (2015). *Cost Accounting A Managerial Emphasis* (15th ed.). Upper Saddle River. New Jersey, USA: Pearson Education, Inc.

Johnson, H., & Kaplan, R. (1987). *Relevance Lost – The Rise and Fall of Management Accounting*. Boston, USA: Harvard Business School Press.

Juran, J.M. & Gryna, F. M. (1993). *Quality Planning and Analysis – From Product Development Through Use* (3rd ed.). New York, USA: McGraw-Hill. Translation (1999). *Planiranje i analiza kvalitete - od razvoja proizvoda do upotrebe*, Zagreb, Hrvatska: Mate.

Kanji, G. K., & Asher M. (2006). *100 Methods for total quality management*, London, UK: Sage Publications.

Kaplan, R. S., & Anderson, S. R. (2004). *Time-Driven Activity-Based Costing*, Harvard Business Review. November, 131-139. Retrieved from: https://hbr.org/2004/11/time-driven-activity-based-costing.

Kaplan, R., & Norton, D. (1992). *The Balanced Scorecard – Measures that drive performance*, Harvard Business review. January – February, 71–79. Retrieved from: https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2.

Porter, M. (1985). *Competitive Advantage*, New York, USA: Free Press.

Lučić, R. (2016). *Analiza mogućnosti primjene integrisanog upravljanja troškovima u velikim proizvodnim preduzećima u Bosni i Hercegovini*. Banja Luka, Bosna i Hercegovina: Acta Economica. 25 (14). DOI doi.org/10.7251/ACE1625061L

Malinić, S. (2013). *Računovodstveno izveštavanje u funkciji razvoja konkurentskih strategija*, Računovodstvo 11-12. Beograd, Srbija: Računovodstvo, Savez računovođa i revizora Srbije, 49-57, UDC 657, ISSN 0023-2394.

ПРЕТПОСТАВКЕ РАЧУНОВОДСТВЕНЕ ПОДРШКЕ ПРИ ПРИМЈЕНИ СТРАТЕГИЈЕ ДИФЕРЕНЦИЈАЦИЈЕ

[1] Предраг Гајић, Економски факултет Универзитета у Бањој Луци; Босна и Херцеговина

САЖЕТАК

Рад је базиран на тези да конкурентност предузећа треба градити на основу рачуноводствене подршке стратегијским изборима. Конкурентност на нивоу појединачног привредног друштва је, у највећој мјери, посљедица управљачких активности менаџера. У новије вријеме, њима су на располагању савремени управљачки концепти, који такође захтијевају адекватну, информациону подршку. Због тога је садржај дефинисане теме имао за циљ да представи могућности рачуноводствене информационе подршке при достизању и мјерењу конкурентности, дефинисане на бази ставова купаца о кључним факторима тржишног успјеха предузећа. Достизање тако постављеног циља допринијело би идентификацији критеријума успјешности рачуноводственог информационог система у обезбјеђивању информационе подршке у достизању жељене тржишне позиције, али и промоцији, у знатној мјери, занемарених могућности овог дијела информационог система у домаћим предузећима. Потребна адекватност информационе подршке представљена је у форми рачуноводствених инструмената који треба да помогну постављање и проведбу стратегије диференцијације.

Кључне ријечи: *конкурентност, конкурентска стратегија, управљачко рачуноводство, обрачун трошкова квалитета, обрачун трошкова на бази атрибута производа, обрачун трошкова на бази циљних трошкова, обрачун трошкова на бази активности*

GLOBAL DEVELOPMENT OF THE ECO-INDUSTRY SECTOR

1 Maria Kaczmarczyk, Department of Development Economics, Faculty of Economics and Sociology, University of Lodz, Poland
*Corresponding author E-mail: mariacharzynska@wp.pl
1 ORCID ID: 0000-0002-7763-412X

ARTICLE INFO

Review Scientific Paper
Received: 18.05.2020
Revised: 15.03.2021
Accepted: 24.03.2021

doi 10.7251/ACE2134137K
UDC
330.15:[338.1:502.131.1

Keywords: eco-industry, green economy, sustainable development, green growth

JEL Classification: Q50

ABSTRACT

Eco-industry has become an equal and recognized economic sector developing in all economic systems in the world. The main reason of its creation was the worsening state of the natural environment in the second half of the twentieth century and also the growing ecological awareness of the contemporary societies. However, the differences in its production level and the resulting regional specializations in its scope in the recent decades are determined by a number of economic, technological and institutional factors. The article discusses the functioning definitions and difficulties in their development and application, as well as the sources of the data on the size of the eco-industry sector in the world. In addition, calculations regarding the growth rate of the eco-industry sector in 1996, 2004, 2012 and 2017 and its internal global industrial structure in 2016 were presented. In the final part of the work there were given and analysed the reasons and consequences related to the explanation of the different production volumes of the eco-industry sector in various countries of the world.

1. INTRODUCTION

Environmental technologies have gained importance in the last two decades, primarily due to the higher ecological awareness of modern societies. Their development also results from the need for effective management of the Earth's ecological resources, which is significantly linked to the category of "eco-efficiency" based on the concept of "creating more goods and services with less resource consumption and creating less waste and pollution" as defined by WBCSD. WBCSD (World Business Council for Sustainable Development) is the global organization run by managers of various levels of over 200 leading companies cooperating with each other to accelerate the transition to a pro-environmentally sustainable activity system. It helps member companies to be more successful, focusing on maximum positive impact on shareholders, environment

and society. Member companies come from all business sectors and all major economies, representing a combined income that exceeds USD 8.5 billion and 19 million employees.

The demographic and economic statistics indicate the migration of modern societies to large cities. Numerous socioeconomic forecasts underline that two to four billion more people will live on the Earth in the next 50 years.

Therefore, there will be a need to design effective ecological solutions for large human communities based on technologies included in the eco-industry sector. In the following analyzes a common OECD and Eurostat definition for eco-industry was used, in which a distinction between basic and so-called related ecological industries was realized. The main branches of eco-industry are those [identifiable] sectors in which the main or significant part of activities is undertaken to produce goods and provide services for measuring, preventing, limiting, minimizing or correcting environmental damage, as well as issues related to waste, noise and the protection of the ecosystems. (see OECD/Eurostat, 1999).

The heart of the ecological crisis is the violation of ecological balance, understood as a category for optimizing the interaction between the nature and civilization. Ecological balance in this sense is a system of relationships between the needs of society and the economy (and the ways of satisfying them) and the environment that contributes to the achievement of the adopted goals (optimal satisfaction of the given needs), while not causing changes in the environment that would threaten the sustainability of the implementation of these purposes. (Dobrzański, 1999).

H. Skolimowski's vision of ethics assumes the existence of a basic moral rule - an ecological imperative. It is a duty of an active person who is reasonably involved in the evolution process to achieve its ultimate goal - the full bloom of life on Earth. The humankind has the greatest ethical rights, but it is also morally responsible for nature as a whole, as well as for its individual components. (Dobrzański, 1999).

B. Prandecka focused on the human dependence on the use of natural resources at every level of economic development and in every society, regardless of the level of civilizational development achieved. (Prandecka, 1991).

Eco-industry is a sector of particular importance for modern economies. In addition to its main necessary role - improving and preventing from the negative changes in the natural environment - it begins to be seen as an element of building competitive advantage and a source of measurable economic benefits. It develops heterogeneously in individual regions and economies due to the mul-

titude of factors that directly or indirectly affect its development. Shaping the economic development policy requires reliable information about the process of creating eco-innovation, which may be followed by the development of the eco-industry sector.

Therefore, it is important and necessary to conduct research on the system of indicators that are helpful in identifying the factors that strengthen or inhibit the process of eco-innovation as well as the balanced and sustainable socio-economic development. (see Araszkiewicz, 2012).

The research problem in the text is the hypothesis that the level of eco-industry sector is in the special relation with the idicators: level of GDP of the economies, the level ecological footprint index and the environmental stringency index. The growth of the eco-industry sector in the contemporary economies is based on the growth of GDP level and the growth of the level of the environmental stringency index and it also causes the loss of the ecological footprint index. This has been indicating the division between the economic growth measured by the GDP indicator and the condition of the natural environment measured by the ecological footprint indicator in the analysed period 1996-2016.

The rest of the article characterizes the eco-industry sector with its origins and presents the current data on the level of its sold production in the contemporary world economies. In addition, the purpose of the text is to answer the question which factors may affect the local volumes of eco-industry production and co-occur with the changes in economies with the highest dynamics of the value of eco-industrial local production in the analyzed period of 1996-2017.

2. MATERIALS AND METHODOLOGY

Eco-industry has gained a position and importance in the international economy since early 1990s, when it began to counteract strongly to the negative changes in the natural environment. At this time the process of keeping the statistics of the production values was introduced.

The interdisciplinary nature of environmental protection science required the construction of a multifaceted, theoretical foundation which it can be based on. One of its elements is economics - nowadays defined as the knowledge about the use of limited resources to create various goods and divide effects between people. (Żylicz, 1999)

The concept of the green economy developed by the OECD in which the practical dimension is the eco-industry sector, is related to such categories as specific

products and services related to pro-environmental activities, investments, sectors of the economy, public procurement, as well as jobs. (Szyja, 2015)

Eco-innovations are seen as such changes that consciously strive to reduce the burden on the environment. It is a kind of combination of innovation (innovation, creativity, change) with the sensitivity and ecological awareness of the organization. Eco-innovation is analyzed with demonstration of its relationships with the concept of sustainable and self-sustaining development. (Araszkiewicz, 2012)

The basis for the creation of the eco-industrial sector is the category of eco-innovation, i.e. the creation of technological units aimed at protecting or improving the environment, which become products and are subject to market laws. One of the key features of eco-industry is its diversity. The scope of activities subject to the basic branches of industry for environmental protection activity ranges from technologically advanced services, for example in the field of renewable energy and air pollution control to mature and well-established applications in recycling and waste processing.

The eco-industry is a market so heterogeneous that it becomes complicated to carry out its strict characterization. The heterogeneity of eco-industry is associated with internal differences in the sub-sectors of ecological industries regarding their opportunities and ability to create inventions and develop further technological potential, as well as regarding their ability to create added value in economies.

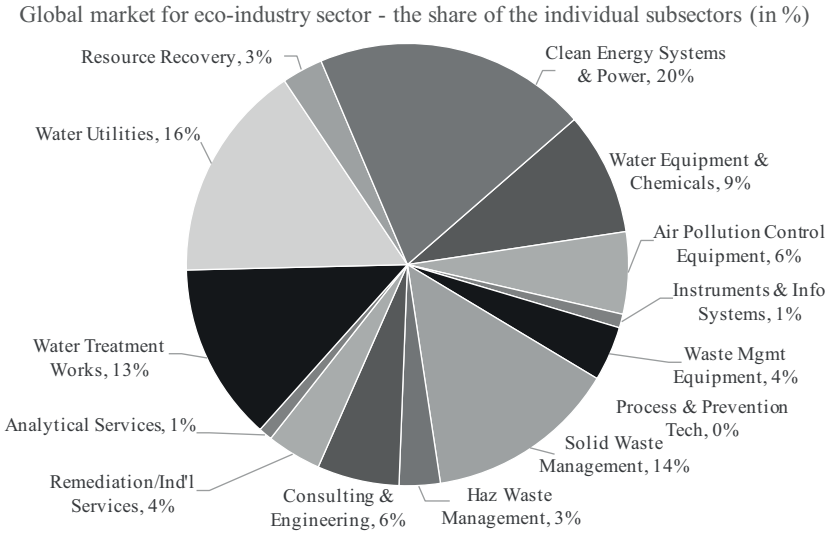
The purpose of this part of the article is to present the regional and national leader – economies in terms of the value of eco-industry's sold production as percentage of GDP . This information was organized in tabular form at 4 time points for 1996, 2004, 2012 and 2017. In the next part of the article, tools were used to analyze the dynamics of the value of sold production of eco-industry in 2004, 2012 and 2017 presented using the individual indexes of this procsses. Then, a graphical representation of the share of thematic sub-areas in the total sold production of eco-industry in 2016 was also realized. The final part of the study analyzes the dynamics of the absolute value of the sold production value level of the eco-industry sector in 2016 in relation to the level of production in 1996 (in constant prices in 2016) in selected world economies. In addition, the time-parallel analysis of the change of the processes associated with and having direct or indirect impact on the size of ecoindustrial production in individual local economies was presented, i.e.

- GDP per capita indicator,
- Ecological footprint indicator,
- Environmental stringency index.

3. RESULTS OF THE ANALYSIS

Figure 1 presents the share of individual thematic sectors in the global market of eco-industry sector. In 2016, the renewable energy system sub-sector had the largest share in the eco-industry production market. Water devices, solid waste management and water treatment systems constituted slightly smaller parts. Smaller share, but also playing a large role in this sector were: hydrological equipment and chemicals, environmental engineering and consulting and the control of air pollution emissions. Other branches had the share in this sector at the level of 4 % and less, and these were: reclamation services, resource recovery, hazardous waste management, waste management equipment, IT systems as well as prevention and management of technical processes.

The data presented in Figure 1 were created by Environmental Business International, which evaluates the size of eco-industry, compiling revenues from the 30-100 largest companies in individual economies, moderating the responses of the survey, as well as the size of the unexplored sector based on estimates of the number of companies in each identified sub-category.



Environmental Business International evaluates the size of eco-industry, compiling revenues from the 30-100 largest companies in individual economies, moderating the responses of the survey, as well as the size of the unexplored sector based on estimates of the number of companies in each identified sub-category.

Figure 1. Global market for eco-industry sector production in 2016 – the share of individual sub sectors (in %). Source: author's own calculation based on EBI Report 3000, *The Global Environmental Market. Fall 2017*, San Diego, CA, p. 20.

Eco-industry is the branch of the economy with the high potential for change in terms of its internal profit transfers, the creation of new interest groups and the activation of new determinants of its development.

At least 50% of the market of US companies providing environmental services and operating outside the home economy belongs to energy or natural resource management concerns, but their market share has decreased due to the dominance of new global corporations (from other regions) and also due to the urbanization processes and the related need to develop local municipal infrastructure, whose services have grown in importance. (EBI Report 3000, 2017)

Strategy to counteract to the negative changes in the natural environment for the global development of eco-business is not as much used as it was a few years ago, or at least not to a significant extent. Due to the impact of global corporations on the global economy, many companies in the eco-industry sector have started to implement the principle of "following the customer" as the best and safest approach to increase their global reach. (EBI Report 3000, 2017)

Global international entities have started to appear and provide comprehensive engineering and assembly services for environmental protection installations worlwide.

In addition, by creating the value added while striving to increase the production capacity in the economies based on natural resources many newer high-rise economies around the Word contribute to the creation of new markets for pro-environmental equipment and services.

The environmental protection sector is largely based on highly specialized technological solutions and its effective functioning is embedded to strict organizational and legislative solutions of individual economies. Barriers to entry into this sector are the advanced know-how and high technology prices.The ecological clusters which have been created for several years are highly complex processes aimed at supporting entrepreneurs in eliminating barriers to the development of eco-industry.

They include many groups of stakeholders - apart from their decision-makers (i.e. small and large companies from major and related industries) - academic institutions and various supporting structures, including cluster organizations and potential investors. All these groups are of key importance for the development of the regional industry for environmental protection, i.e. eco-industry. (Europen Cluster Observatory, 2013)

In the WIFO document dated 2006 within the global market for eco-industry two main segments were identified and analysed to measure the level of advancement of eco-industry in the global economies (Ecorys 2009):

1. The eco-industry market in developing countries where the demand for clean water and wastewater treatment accounts for the majority of this industry;
2. The market in developed countries where more advanced and highly valued products and services are offered.

The structure of dependencies within the eco-industry sector changes in individual stages of its functioning on the markets. The main clients of eco-industry products and services in the initial stages of its development in a given economy operate primarily in the public sector. Private sector demand is gradually increasing in relation to the public sector. The public sector plays a significant role in demand thanks to the system of regulations, subsidies and procurement policy in the early stages of development of the eco-industry sector. Over time, pro-environmental industries are maturing and evolving, becoming more integrated with business and conventional industries and sectors (Ecorys, 2009).

A preliminary analysis of the register of enterprises active in the eco-industry sector indicates that it is a significantly concentrated sector in which around 10% of companies account for almost 80% of its total operating revenues and turnover.

Factors determining the development of eco-industry beyond the natural trends of economic concentration lie in companies' ability of geographical extension, business expansion and reaching a critical level in order to bear the initial costs of research and development (Ecorys, 2009).

The sector of goods and services for environmental protection (eco-industry) is characterized by the extremely uneven growth in individual countries of the modern world compared to other industries and economic activities. It is determined by a significant number of determinants of its development that can be divided into economic, organizational, technological and institutional factors of individual regions and economies.

In addition, internationalization in many eco-industry subsectors takes place through trade in services and investments, not just through products trade. Also, growing pressure on the environment, evolving pro-environmental legislation, international obligations and emerging opportunities and the needs of emerging economies of the BRICs block are creating a new set of interests and connections within it.

According to Table 1 presenting the shares of individual countries and regions of the world in the global production of eco-industry in 1996, 2004, 2012 and 2017, the highest percentage in this value in 4 years analyzed was in the markets such as USA, Western Europe and Japan.

USA keeps the largest share in global eco-industrial production with a 37.5% share

in 1996, which was 31% in 2017. Western Europe is in second place in the production value ranking for 1996 with the result of a 29.2% share in the eco-industrial market and recorded a slight decrease in this respect to 27% in 2017.

Japan is the third largest eco-industry market, which with 19.1% of world production

in 1996 reached 9.5% in 2017. Other Asian economies have tripled their market share in products and services for environmental protection over the period 2004-2017. Mexico increased the percentage of share in the eco-industry sector from 6% to 14% in 2017. Other Latin American economies achieved a 4% share in 2017. Canada recorded a slight increase in 2017 from 2.9% in 1996 to 3% in 2017. Australia and New Zealand as well as Central and Eastern Europe accounted for 1.6% in this market in 1996 and showed an increase to 2.9 % and 2.5% in 2017, respectively. The Middle East and Africa recorded an approximately threefold increase in their share in the eco-industry market.

The global eco-industry sector grew in 1996 at a rate of 2.2%, while in the following years the growth rate reached 5.5%, 3.5% and 3.7% in 2004-2012 and 2017 compared to the previous year of the above analysis.

Table 1. The global value of sold production of eco-industry in 1996, 2004, 2012 and 2017 - share of individual regions and economies in %.

	1996	**2004**	**2012**	**2017**
USA	37.50%	37.20%	36.50%	31%
Western Europe	29.20%	29.10%	27%	27%
Japan	19.10%	15.10%	11.80%	9.50%
Rest of Asia	4.20%	6.40%	10.50%	13%
Mexico	6%	7%	9%	14%
Rest of Latin America	1.60%	2.40%	2.90%	4%
Canada	2.90%	2.70%	2.60%	3%
Australia/Nz	1.60%	1.70%	1.70%	2.90%
Central/East. Europe	1.60%	2.10%	1.90%	2.5 %
Middle East	1.10%	1.60%	2.90%	4.00%
Africa	0.50%	0.90%	1.40%	1.30%

Source: author's own calculations based on EBI Report 3000, The Global Environmental Market, Fall 2017, San Diego, CA, p. 18-19.

Table 2. The dynamics of the value of sold production of eco-industry in selected economies and regions of the world in 2004, 2012 and 2017.

	2004, 1996 = 100	2012, 2004 = 100	2017, 2012 = 100
USA	0.99	0.98	1.18
Western Europe	1.00	0.93	1.13
Japan	0.79	0.78	1.11
Rest of Asia	1.52	1.64	1.44
Mexico	1.23	1.22	1.21
Rest of Latin America	1.46	1.21	1.16
Canada	0.93	0.94	1.18
Australia/Nz	1.11	0.97	1.08
Central/East. Europe	1.35	0.91	1.08
Middle East	1.39	1,87	1,49

Source: author's own calculations based on EBI Report 3000, *The Global Environmental Market*, Fall 2017, San Diego, CA, p. 18-19 and Eurostat, GDP deflator, https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=sdg_08_10&language=en [20-03-2019].

Table 2. presents the dynamics of the global sold production of eco-industry sector in 2004, 2012 and 2017 according to which the high value of eco-industry growth in the analyzed years was noticed for Asia (excluding Japan), Mexico, Latin America (without Mexico), the Middle East and Africa. A significant increase (by 35%) was also recorded in 2004 compared to 1996 in the eco-industry sector in Central and Eastern Europe, while in 2017, compared to 2012, eco-industry in the US also grew at a high rate of 18%.

The highest growth rate of the eco-industry sector was recorded for Asia (excluding Japan), Middle East and African economies at three time points analyzed and also for Latin America (excluding Mexico).

Arundel and Kemp stated that measuring eco-innovation, and thus the production level of the eco-industry sector contributes to the comparative analysis of countries, determining the level of the process of disconnecting socio-economic growth and environmental degradation (so-called decoupling) (Kanerva, 2009).

As in Europe, an important driver of the development of eco-industry and especially of some of its sub-segments around the world are rising energy costs and the growing demand for energy efficiency (Ecorys, 2009).

However, according to J. Horbach, the determinants of eco-innovation form Tyree main groups: demand, supply and external factors related to public institutions and their development policy (Horbach, 2005).

Kuznets's theory assumes that the negative environmental impact of individual economies increases to a certain level of the national income achieved after which it begins to fall. This is due to the transfer of resources towards new higher needs realized by the consumption of luxury goods, which include a clean natural environment (Kuznets, 1955).

The next section analyzes the selected economic indicators that may directly or indirectly affect the level of ecoindustrial production (as mentioned in the literature above) in selected global economies - i.e. the level of GDP per capita, the level of the ecological footprint and the level of strictness of pro-environmental regulations (environmental protection stringency indicator) in the individual economies of the world.

Table 3. The dynamics of the value of eco-industry production in 2016 (1996 = 100) and its determinants in selected global economies

	The dynamics of the value of eco-industry production in 2016, 1996 = 100	GDP per capita in 2016, 1996 = 100	Ecological footprint 2016, 1996 = 100	Environmental stringency index average level for 2014-2017	Environmental stringency index – place in the ranking
USA	2.43	1.34	0.810	5.5	8
Western Europe - Germany	2.05	1.32	0.828	6.14	2
Japan	1.06	1.17	0.804	5.59	7
Rest of Asia – China	3.85	5.16	1.895	3.8	40
Mexico	8.26	1.26	0.897	3.61	39
Rest of America - Brazil	8.93	1.27	0.903	4.09	29
Canada	2.07	1.36	0.895	5.39	15
Australia/Nz	5.10	1.43	0.846	5.02	12
Central/East. Europe= Poland	3.54	2.18	0.936	4.16	26

Source: own calculations based on EBI Report 3000, *The Global Environmental Market*, Fall 2017, San Diego, CA, p. 18-19, World Bank 2019 https://data.worldbank.org/indicator/NY.GDP.PCAP.KD [12-06-2019], Ecological Footprint 2019, https://www.footprintnetwork.org/our-work/ecological-footprint/ [12-06-2019].

GDP per capita is a measure of economic activity and also serves as an indicator of the development of material standards of living in the country. However, this is a limited measure of economic well-being. GDP does not include the majority of unpaid household work, nor does it take into account the negative effects of economic activities, such as environmental degradation. The data comes from

World Bank statistics and are ordered in the 2010 fixed price formula in US dollars.

The ecological footprint indicator and its individual components measure utilization and future opportunities to use ecological resources. Based on around 15,000 subcomponents in the form of national statistical data on an annual basis, the ecological footprint indicator is calculated for over 200 economies, territories and regions from 1961 to the present. Data on the ecological footprint accounts are related to, among others food and agriculture organizations, the United Nations goods trade database and the United Nations Department of Statistics, as well as the International Energy Agency. Supplementary data sources include research in peer-reviewed scientific journals and thematic collections. Of the countries, territories and regions analyzed in the ecological footprint accounts, as many as 150 had a population of over one million and are based on complete and reliable data sets. For most of them, the Global Footprint Network is able to provide a time series of both the ecological footprint and the so-called biological capacity

OECD environmental policy stringency indicator (EPS) is a measure of the rigor of environmental policy for a given country and a tool comparable internationally. The sharpness is defined as the extent to which environmental policies define explicite or hidden price for pollutant or environmentally harmful behavior. The index ranges from 0 (not strict) to 6 (highest stringency). The index includes 28 OECD countries and 6 BRIICS countries for the period 1990-2012 and years 2014 and 2017 developed in consultation with Environmental Business International. The index is based on the degree of rigor of 14 environmental policy instruments, mainly related to the climate protection and the atmospheric pollution

In accordance with Table 3, the highest production dynamics in the eco-industry sector in 2016 compared to 1996 was achieved by Brazil (8.93). Mexico came in the second place with a dynamics of 8.26. At the same time, Brazil and Mexico had similar dynamics of GDP per capita - 1.27 and 1.26% respectively and decreasing dynamics of the ecological footprint indicator at 0.903 and 0.897. The dynamics of the envirmnemtal stringency index in 2017 was was on the level of 3.61 for Mexico and 4.09 for Brazil in comparison to 1996.

Moderate dynamics in the value of eco-industry production in 2016 in relation to 1996 and in comparison to other analyzed economies was recorded for Australia with New Zealand, China and Poland. China achieved over five times bigger economic growth compared to 1996, while Australia with New Zealand showed dynamics at 1.43 and Poland - 2.18. The ecological footprint indicator increased in China at this time as much as 89.5%, while in Australia with New Zealand

and in Poland it decreased by 15.4% and 6.4%, respectively. In addition, China was in the last place in the ranking of the environmental stringency index in comparison to other analyzed economies with Australia and New Zealand on the high 12th place.

USA, Germany, Japan and Canada showed moderate growth in the scope of eco-industry production compared to other analyzed regions.The GDP per capita dynamics in these economies ranged from 1.17 in Japan to 1.36 in Canada, and the ecological footprint index in these countries declined compared to 1996. In these economies, the environmental stringency index also occupies a high position in the ranking taking into account the majority of global economies.

According to the material presented above, it becomes possible to formulate conclusion about a visible separation of the economic development process (here measured by the GDP per capita indicator) from the introduction of significant negative changes to the natural environment in modern economies. This is evidenced by the fact that the presented countries (excluding China), realizing economic growth of several or several dozen percent in 2016 compared to 1996, simultaneously reduced the ecological footprint indicator expressing the degree of changes introduced to the natural environment as a result of human economic activity.

Only China, due to its more than five times bigger economic growth in 2016 compared to the base year 1996, showed a strong increase in the ecological footprint index. It should be emphasized that China was at that time at the low place in the ranking in terms of the regulatory index of environmental stringency in their economy. This fact could be associated with the insignificant role of the eco-industry sector in the process of separating the economic development process from the creation of the negative changes in the environment, despite the significant dynamics in the production of the eco-industry sector in the Chinese economy.

Less dynamic economic growth in the analyzed period in Mexico and Brazil was associated with a decreasing indicator of the ecological footprint. This could be due to a much larger parallel increase in the production of environmental technologies (eco-industry) compared to China, which took place in these economies with a similar level of severity of environmental stringency index that was in force at the same time in China.

Eco-industrial industries in the United States, Germany, Japan and other countries not only compete with each other in their markets, but also in the third markets, especially in developing countries. Competition in the eco-industry market

is in effect a triple race between three largest market shareholders. However, some Asian countries have strengthened enough in niche markets recently and are achieving good export results, while China has even become the market leader in some eco-industry segments, e.g. solar cells (Ecorys, 2009). The growth of the eco-industry sector is related also with the the growing level of the environmental stringency index in the above presented research.

While the EU focuses on pollution control, waste management and integrated production's chain management, Japan and the United States are focusing on developing innovative equipment enabling them to take a leading position in the field of hybrid cars as well as green design. In addition, emerging countries such as China have been particularly successful in developing advanced environmental technology subsectors through foreign direct investment (Europen Cluster Observatory, 2013).

Currently, fast-growing economies such as China and, to a lesser extent, India, use public funds to develop eco-industries. China is seriously exposed to the effects of environmental pollution because of the rapid economic growth and made political commitments to combat negative environmental changes (ECORYS Netherlands and IDEA Consult, 2009).

4. SUMMARY AND CONCLUSIONS

The eco-industry sector is developing all over the world due to its potential to counteract to the adverse changes occurring in the natural environment. In addition, it has become a source of economic profit creation, i.e. a high share in building the national GDP or raising the competitiveness of the industry and entire economic systems.

Developing economies, especially from the region of Asia as well as Latin and South

America feel entitled to pollute the environment in order to achieve a high standard of living for their inhabitants, as it was done in the previous decades by the largest and richest world economies. To keep the environment in good condition and to achieve the productive efficiency, both the richest, developing and emerging economies form native ecoindustries sectors.

World economies have begun to compete in the market in this sector, which has resulted in the exchange of know-how, foreign direct investment and the growth in the field of eco-industrial export. Many economies recorded double-digit growth in this sector over the period 1996-2017. All these aspects contribute to

the development of new strategies for companies to enter and stay in the national and global eco-industry sector, as well as the patent creation systems and the production and dissemination of technologies for environmental protection. The eco-industry sector is beginning to play the role of a kind of catalyst for separating the economic development process from introducing negative changes into the natural environment, which was analyzed on the example of rapidly developing global economies, that at the same time show their significant share in the creation of the value of global production of the eco-industry sector.

Conflict of interests

The author declares there is no conflict of interest.

REFERENCES

Araszkiewicz, K. (2012). *Innowacje ekologiczne a konkurencyjność gospodarki*. Poznań, Poland:Economic University in Poznań.

Dobrzański, G.(1999). *Istota i cechy współczesnego kryzysu ekologicznego*. Bialystok, Poland: Ekonomia i Środowisko, No 1(14).

EBI Report 3000 (2017). *TheGlobal Environmental Market*, San Diego, Canada. Environmental Business International

Ecological Footprint (2019). Ecological footprint. Retrieved from: https://www.footprintnetwork.org/our-work/ecological-footprint/.

EcorysNetherlands and IDEA Consult. (2009). *Study on the Competitiveness of the EU eco-industry*", Study within the Framework Contract of Sectoral Competitiveness Studies – ENTR/06/054 for DG ENTR of the European Commission, Final Report – Part 1, , Retrieved from: https://op.europa.eu/en/publication-detail/-/publication/76dab816-c9d2-4469-9239-e1c25e55c675 [06-02-2019].Brussels, Belgium: EcorysNetherlands and IDEA Consult

EFW (2010). *Economic Freedom of the World: 2010 Annual Report*. Vancouver, Canada: Fraser Institute

Europen Cluster Observatory (2013). *Eco-industries. Analysis of industry-specific framework conditions relevant for the development of world-class clusters*. European Union, Retrieved from: http://www.clusterobservatory.eu/eco/uploaded/pdf/1381911725803.pdf.European Union: Europen Cluster Observatory

Eurostat (2019). GDP Deflator. Retrieved from:https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=sdg_08_10&language=en.

Horbach, J.(2005). *Indicator systems for sustainable innovation*. Heidelber, Germany: Physica.

Kanerva M., Arundel A., Kemp R. (2009). *Environmental innovation: Using qualitative models to identify indicator for policy*, Maastricht. Netherlands: United Nations University Working Papers Series

Kuznets, S. (1955). Economic growth and income inequality, *American Economic Review 49*, 1-28.

Lisiecka, K., Kubasik A.(2001). Środowisko *w globalne orientacji zarządzania przedsiębiorstwem*, Katowice, Poland: Akademia Ekonomiczna im Karola Adamieckiego, Kolegium Zarządzania.

OECD/Eurostat 1999. *The Environmental Goods and Services Industry – Manual for Data Collection and Analysis*: Retrieved from: https://books.google.pl/books?id=D0NfqagKjhsC&pg=PA7&hl=pl&source=gbs_selected_pages&cad=2#v=onepage&q&f=false. Paris, France: OECD

Prandecka, B. (1991). *Nauki ekonomiczne a* środowisko *przyrodnicze* , Warsaw: Poland.

Szyja, P. (2015). *Zielona gospodarka w Polsce – stan obecny i perspektywy*, Poland: *Nierówności Społeczne a wzrost Gospodarczy*, 41(1) 2015, 432–447.

Ecorys (2009). Eco-industries: Scoping paper 2006 retrieved from: ECORYS Netherlands and IDEA Consult ,"*Study on the Competitiveness of the EU eco-industry*", Study within the Framework Contract of Sectoral Competitiveness Studies – ENTR/06/054 for DG ENTR of the European Commission2009, Final Report. Part 1. Brussels, Belgium: Ecorys.

Vuong, B. (2018, November). *IBISWorld industry report OD5381. Coffee shops in Australia*. Retrieved from IBISWorld database.

World Bank (2019). GDP per capita.Retrieved from: https://data.worldbank.org/indicator/NY.GDP.PCAP.KD.

Żylicz, T. (1999), *Ekonomia* środowiska *i zasobów naturalnych*, Warsaw, Poland: PWE.

ГЛОБАЛНИ РАЗВОЈ СЕКТОРА ЕКО-ИНДУСТРИЈЕ

[1]Марија Казмарчик, Одсјек за развојну економију, Факултет за економију и социологију, Универзитет у Лоџу, Пољска

САЖЕТАК

Еко-индустрија је постала равноправан и признат економски сектор који се развија у свим економским системима у свијету. Главни разлог његовог настанка било је погоршање стања природног окружења у другој половини 20. вијека, као и растућа еколошка свијест савремених друштава. Међутим, разлике у производњи и обим проистеклих регионалних специјализација у посљедњим деценијама одређени су бројним економским, технолошким и институционалним факторима. Рад разматра дефиниције функционисања и потешкоће у њиховом развоју и примјени, као и изворе података о величини сектора еко-индустрије у свијету. Поред тога, представљени су прорачуни у вези са стопом раста сектора еко-индустрије у годинама 1996, 2004, 2012. и 2017. и унутрашња структура глобалних индустрија 2016. године.

У завршном дијелу рада дати су и анализирани разлози и посљедице који се односе на објашњење различитих обима производње сектора еко-индустрије у различитим земљама свијета.

Кључне ријечи: еко-индустрија, зелена економија, одрживи развој, зелени раст.

COVID-19 PANDEMIC CHALLENGES TO MICRO, SMALL AND MEDIUM ENTERPRISES IN NIGERIA: STRATEGIC OPTIONS FOR SURVIVAL

1 Waidi Adeniyi Akingbade, Department of Business Administration,
Lagos State University, Ojo, Lagos, Nigeria
*Corresponding author email: akinwaidi@gmail.com
1 ORCID ID: 0000-0002-6589-2412

ARTICLE INFO

Review Scientific Paper
Received: 03.01.2021
Revised: 19.04.2021
Accepted: 14.05.2021

doi 10.7251/ACE2134153A
UDC
330.101.541(669):[616.98:
578.834

Keywords: *COVID-19 Pandemic, crisis management response, economic downturn, MSMEs, survival strategy.*

JEL Classification: M21

ABSTRACT

COVID-19 Pandemic posed a great threat and challenges to the business world, especially the Micro, Small and Medium Enterprises (MSMEs). Many of these enterprises suffered a great downturn in business activities and reduction in profit volume. Many of them were forced to close down while others survived on the margin. The government and other stakeholders in the MSMEs have provided solutions to their problems but most of them have not really yielded the desired result. This paper investigates the challenges that MSMEs in Lagos State encountered as well as the strategic options for their survival during the Covid-19 Pandemic era. A survey research design was adopted and primary data were collected with the help of questionnaire. The population of study was 3,224,324 registered MSMEs in Lagos State, while the sample size of 400 was determined with Yamane (1967) formulae. A simple random sampling technique has been employed to administer 400 copies of questionnaire out of which 297 were properly filled and returned. The findings from the regression analysis and the descriptive statistics revealed that there is no significant effect of MSMEs Covid-19 challenges (such as: decline in productivity, business closure, supply chain breakdown, low customer demand, reduction in profit volume, self-isolation, reduced opportunities to meet new clients) on business survival. Also, it was revealed that most of the respondents adopted cutting expenses as a strategic option for the survival of their businesses. However, the study concluded that Covid-19 Pandemic is a major threat to MSMEs survival and growth. It was recommended that MSMEs should embark on cutting expenses in order to survive Covid-19 and further, they should embrace crisis management response, finance and liquidity, operation and supply chain, determine and activate the business continuity plan, monitor the implementation to enhance their survival and readjust their response approach towards environmental changes.

1. INTRODUCTION

The Coronavirus (COVID-19) Pandemic is a highly transmittable and pathogenic viral infection caused by severe acute respiratory. It emerged in Wuhan, China, and spread around the world to over 223 countries. It caused a global economic meltdown after the world great economic depression of 1930s (International Monetary Fund, 2020; World Health Organization, 2020). Globally, as of 23rd February, 2021, there have been 111,419,772 confirmed cases of COVID-19 with the death of 2,470,772 and 3,837,298 cases with 101,627 death cases were confirmed in Africa (WHO, 2021), While in Nigeria there were 153,187 confirmed cases with the death of 1,874 and 129,943 discharged (NCDC, 2021).

It started as a health crisis but has rapidly evolved into one of the worst economic crises in history. COVID-19 Pandemic has caused global challenges, emergencies and crisis in all sectors of economy especially in health, education, transportation, tourism, trade, investment (Abulescu, 2020) and has led to a high level of unemployment which has adversely hindered the standard of living.

MSMEs significantly contribute to the economic growth and development of Nigeria's economy in particular and global economy in general. They represent a seedbed of entrepreneurial skills and innovation, contribute to job creation, and are considered the backbone of the global economy (Alliance for financial inclusion, 2017). The World Bank has reported that formal MSMEs contribute up to 45% of total employment and up to 33% of national income (GDP) in emerging economies. These numbers would be significantly higher if MSMEs in the informal sector were also included. In Nigeria, MSMEs are generally referred to as enterprises with less than 10 employees, with assets excluding land and building of less than N5million; small enterprises with 10 to 49 employees, assets excluding land and building of N5million and less than N50million; while medium enterprises engaged 50 to 199 employees and assets of N50million to less than N500million excluding land and building (SMEDAN/NBS, 2013).

COVID-19 Pandemic has seriously hurt MSMEs that are considered the backbone of Nigeria economy to the extent that social distancing, transportation, border restrictions, and total lockdowns have interrupted supply chains, reduced consumer demand and cut cash flow. The outcome of all this is that businesses are unable to pay worker's salaries, shop rent, utility bills, credits resulting in bad effects on households and the economy (Vandenberg, 2020). COVID-19 serves as a threat to the survival of MSMEs while quarantines, shelter in place orders, social distancing, and cascading economic impacts make it difficult for many of these firms to carry out business activities. MSMEs are housed by five major sectors of the Nigeria economy: Wholesale and Retail Trade account for 42.3%,

Agriculture represents 20.9%, Manufacturing 9.0%, Accommodation and Food Services 5.7%, and other services 13.1%, all together equal to about 91.0% of all MSMEs (Kale, 2019). Further, 97.1% of MSMEs in Nigeria are owned by sole proprietorship while partnership accounted for 2.2% in terms of ownership status (Kale, 2019).

COVID-19 Pandemic poses great threats and challenges to the business world most especially the Micro, Small and Medium Enterprises (MSMEs). Many enterprises suffered a great downturn in business activities and profit. Many of them were forced to close down while others survived on the margin. The consequent lockdown of the economy and the new normal in business practices caught many firms in the web of distortion in financial flow and industry strategic position. The government and other stakeholders in the MSMEs have provided a solution to their problems but most of them have not really yielded the desired result. The objective of this paper is to show the effect of COVID-19 Pandemic survival options by MSMEs on crisis management response and to examine the impact of COVID-19 Pandemic on MSMEs business survival. This paper examined various strategic options for survival of Covid-19 Pandemic challenges to MSMEs in Nigeria. Based on the aforementioned, the study therefore wants to investigate the challenges that MSMEs in Lagos State have encountered as well as the strategic options for survival during the Covid-19 Pandemic era.

2. LITERATURE REVIEW

2.1. History, Health Implications and Consequences of the COVID-19 Pandemic

The COVID-19 Pandemic is an unprecedented universe health and economic crisis that has ravaged the entire world. It started as health crisis before turning into the global economic downturn that hindered trade, investment, growth and employment (ITC, 2020). There is no doubt that coronavirus pandemic is one of the deadliest infectious diseases to have taken place in human history. Presently, COVID-19 is a respiratory infection disease that can be transmitted from one person to another. In addition, the disease has ravaged people across the globe, hence WHO classified it as pandemic on March 11th, 2020. Further, the infection has gone beyond public health crisis but also had negative impact on the world economy. Hence, the consequences are business fold up, trade disruptions, reductions in manufacturing and productivity, increase in unemployment, damage of tourism and aviation industries among others (Pak, et al., 2020).

Health officers noted that a new strain of COVID-19 may likely emanated from bats or pangolins. In this regard, the human transmission was firstly recorded in

the city of Wuhan, China, and most of the infected people or cases had connection with the local seafood market popularly called Wet market (Ajibo, 2020; Li et al, 2020). Some of the COVID-19 patients symptomatology include fever, dry cough, dyspnea, breathing difficulty, muscle aches, headache, sore throat or diarrhea, runny nose and tiredness (CDC, 2020b; Ajibo, 2020; Liu, Kuo & Shih, 2020; Zhu et al, 2019). The roll call of the previous pandemics and the number of deaths recorded was itemized by Johnson & Mueller, (2002); Kain & Fowler, (2019); Simonsen, et al, (1998); Vibound et al, (2016) and Liu et al, (2020) as 1918 Spanish flu with about 50 million deaths, as 1957 Asian flu with estimated 1.5 million deaths, as 1968 Hong Kong flu with almost 1 million deaths and as 2009 pandemic flu with approximately 300,000 deaths.

However, the following preventive measures were recommended by WHO (2020b) & NCDC (2020) against the spread of COVID-19 Pandemic: frequent use of at least 60% alcohol based sanitizer, regular hand washing with soap and running tap water, wearing face mask, maintaining social distance of at least 2 meters, avoid touching your face and nose, coughing in to your elbow, work from home, staying at home unless it is compulsory to go out, urgently seeking medical attention or going for COVID-19 test in the designated government approved centre in case of any symptoms of coronavirus pandemic, cleaning the environment and adhering strictly to COVID-19 protocol as stated by national and international health organizations. Boseley, Devlin & Belam (2020) stated that patients' strong immune system is largely responsible for their recovery from the infection despite the non-availability of official approved vaccine for the pandemic by the federal government of Nigeria. The story remains the same until 18th of February, 2021 when National Agency for Food and Drug Administration and Control (NAFDAC, 2021) officially approves the use of Oxford Astrazeneca vaccine in Nigeria to cure the virus.

2.2. COVID-19 Survival Strategies

Coronavirus pandemic seriously inflicted a lot of agony on MSMEs performance which hinders their survival. The following key strategies identified (PWC, 2020; Keyte, 2020; Technoserve, 2020 and Vandenberg, 2020) are important for MSMEs to survive and improve their performance during and after the global COVID-19 Pandemic.

Crisis management and response: Business enterprises need to respond quickly to the outbreak of the COVID-19 Pandemic and put in place measures to manage the deadly crisis. Current business continuity plans may not be relevant in managing the fast spreading COVID-19 crisis. Therefore, MSMEs owners need to develop incident management and scenario plans that are focused on

the pandemic: adequate and regular communication with stakeholders such as employees, customers, host community, regulatory agency; comply with government directives and limit the risk of business failure (PWC, 2020).

Workforce: Is the labour pool either in employment or unemployment (US Bureau of Labour Statistics, 2016). It is generally used to describe those working for a single company but can also apply to a geographic region such as a state or a country (Keyte, 2020). Management also considers welfare of workers and how to support remote working at scale. Therefore, attention to immediate global mobility, such as reviewing travel rules, human resources; using remote working strategy, asking employees to temporarily stop work or work from home; offer solutions to challenges on current information technology and communication infrastructure to assist work from home during and after the pandemic (PWC, 2020).

Operations and supply chain: COVID-19 Pandemic has seriously hindered effective supply chain distributions of products across the world due to borders closure. Hence, MSMEs need to opt for alternative local raw materials as a substitution strategy to remain in operation and make the end products conveniently available to the final consumers at affordable prices (Keyte, 2020). Finance and liquidity: financial markets are seriously hindered by the COVID-19 Pandemic, which results in total lockdown and subsequently economic recession.

Tax, trade and regulatory: There is a need for a downward review of tax regime or tax exemption for MSMEs during and after the COVID-19 Pandemic to survive the crisis. The regulatory agency and government at all levels need to consider the impact of the pandemic on business enterprises, hence consider the option of tax relief as survival strategies.

Strategy and brand: MSMEs are trying to relax the effects of the pandemic on their businesses, hence opt for the following strategies: consider accelerating digital transformations as the shift to teleworking revealing the gaps in information technology infrastructure, workforce planning and digital upskilling (PWC, 2020); enhanced growth and improved performance via planning, financial discipline, products rebranding, packaging and new approach to business.

New normal business strategies: This is the modern way of doing business via technology, a digital business model and e-commerce, in order to shift to digital commerce channel including an emerging or a new market and start many other businesses online (Keyte, 2020). By working from home, businesses are forced by circumstances and conditions to adopt teleworking and the benefits are reduced businesses spending and expenditures on rent and improved flexibility in business operations. Local supply chains and border closure which affect inter-

national business have forced many firms to opt for local supply chain of raw materials and this has created opportunities for small business recognition in their area of competency (Technoserve, 2020 and Vandenberg, 2020).

Government support, international donors and developed countries' aid will help the MSMEs in Nigeria to recover and survive the crisis. For example some developed countries like United States of America, Germany, and United Kingdom donated the COVID-19 relief package in cash to the Federal Government of Nigeria. Technoserve (2020) and Vandenberg (2020) pointed to customer values, putting customer safety first and re-assuring the quality process of production because the product quality must not be compromised.

The production and management process: There must be environment and technology guarantee for safety of all stakeholders during and after pandemic lockdown. Furthermore, knowledge worker management: enterprises must be a learning organization by providing creative environment to a knowledge worker and invest more in human capacity development.

Tax deferral: All forms of taxes such as income tax, property tax, excise duties, shop permits and other payments by businesses to government are deferred to ease liquidity problems that are encountered by MSMEs during the COVID-19 Pandemic (Vandenberg, 2020). Credit: the Federal Government of Nigeria makes more credit available to MSMEs through various means such as direct lending through the Central Bank of Nigeria (CBN), Bank of Industry, interest rates reduction, CBN monetary relaxation and extending grace periods on existing loans. Wage subsidy: government should assist the MSMEs financially in paying wages to employees during lockdown to sustain the company. Enterprises pivot: the federal, state and local governments in Nigeria should encourage MSMEs to adapt to current business climate and change to new products and services.

2.3. MSMEs Contributions to the Growth of Economy in Nigeria

MSMEs can be defined based on the number of employees such as 1–9, 10–49 and 50–249 as micro, small and medium enterprises respectively (World Bank, 2014). Meanwhile, MSMEs definition differs from country to country. Besides the number of employees, other variables such as assets, turnaround, and capital among others are also considered in its definition. The world economies, particularly those of industrialized countries like Nigeria, stand on the shoulders of MSMEs business enterprises to grow. The reasons for this are not farfetched, they are the result of attributes MSMEs possess such as creativity, dynamics, innovation, flexibility, efficiency, effectiveness and their portable size which enables a faster decision-making process (Afrikan Heroes, 2020).

The contributions of MSMEs to the growth and development of any economy cannot be underestimated, and they include: contribution to the economy in terms of increase in the quantity of goods and services; creation of job opportunities globally and particularly to over 84% of Nigerian at relatively low capital cost (Afrikan Heroes, 2020), especially in the wholesale and retail sector; reduction of the gap between the rich and the poor (Fitriasari, 2020); the key to the economic growth and development of the country (Akingbade, 2020); development of a large number of skilled and semi-skilled employees as a basis for future industrial growth; improvement of forward and backward integration strategies between economically, socially and geographically diverse sectors of the economy; provision of opportunities for developing and adapting to appropriate technological approaches; creation of an environment for entrepreneurial and managerial talent, among others. MSMEs are essential for the industrialization of the world economy and serve as the backbone of the socio-economic transformation of industrializing and industrialized economies (Ogundele, 2017). MSMEs enhance technical, technological and entrepreneurial capacities among critical segments of the economy. MSMEs serve as a medium for the redistribution of income, provision of job opportunities and creation of wealth among the poor in the country (Kale, 2019). MSMEs are believed to be the engine room for the development of any economy because they form the bulk of business activities in a growing economy like Nigeria.

2.4. Challenges of COVID-19 Pandemic to MSMEs

The world at large has been engulfed with an unprecedented COVID-19 Pandemic which emanated from a health crisis to an economic meltdown. Scholars reaffirm the fact that MSMEs all over the world are the most significant victims of the prolonged COVID-19 Pandemic and economic crisis (Fitriasari, 2020; Bourletidis & Triantafyllopoulos, 2014). Hence, MSMEs challenges are cutting through crises in health, economy and business, as the governments at all levels are trying to reduce the spread of the virus and gradually start the economy. Consequently, some of the major challenges that MSMEs encounter as identified by Vandenberg (2020) are: lack of operational cash flow, that is, most of the surveyed MSMEs in Lagos state have shortage of cash reserves for less than a month; decrease in customer demand for goods and services due to economic downturn; business closure due to government lockdown policies to prevent the spread of the virus to other parts of the country; reduced opportunities/chances to meet new customers as a result of federal government lockdown order in Lagos State which affects business activities; issues that entail changing and introducing new business models and strategies, providing new products or

services which is seriously affected because of work from home policies of the government and closure of business activities; decline or reduction in sales due to lockdowns, movement restriction, social distancing and closure of shops and offices; operational challenges like movement restriction affecting the supply of goods and social distancing guidelines making it difficult for business to operate; personal stress, a business owner or manager finding it difficult to adapt to the current business challenges and managing their and their employees stress.

2.5. Entrepreneurship Theory

Entrepreneurship is the main source of economic growth and instrument for a change within any economy (Audretsch, 2015; Dorin & Alexandru, 2014; Schumpeter, 2012). Meanwhile, Schumpeter noted that economic growth and development are attained through innovations, which results in increase in productivity (Konstantakis, Michaelides, & Papageorgiou, 2014).

Further, he stated five types of behaviour that entrepreneurship exhibited: development of a new product, modern method of production, creation of a new market, setting up a new organization within an industry, or backward integration strategy, and self-development of source of raw material (Dorin & Alexandru, 2014; Konstantakis et al., 2014).

Further, the development of new and varieties of products, services, and processes challenged the old way or status quo of the existing marketplace and gave entrepreneurs a competitive advantage (Autio, Kenney, Mustar, Siegel, & Wright, 2014). Three main motivators for MSMEs entrepreneurship are the intention for power and independence, the belief to excel, and the happiness of creating (Dorin & Alexandru, 2014). These identified attributes in MSMEs owners motivate them to create better business enterprises. These attributes in the owner of a small business encouraged them to look for opportunities that took them off the normal business development path (Autio et al., 2014).

Consequently, entrepreneurship theory pivots around innovation, against the traditional approach and support new ways of doing things. MSMEs business owners attain economic growth from their competitors (Baumol, 2015; Dorin & Alexandru, 2014; Bogliacino & Pianta, 2013; Schumpeter, 2012).

Based on the review of the past studies, this study hypothesized that there is no significant effect of MSMEs Covid-19 challenges on business survival and also the study intended to offer solution to the strategic options that are most employed by MSMEs for survival.

3. MATERIALS AND METHODS

The study employed survey research design. The population of the study is the total number of registered 3,224,324 MSMEs in Lagos State (SMEDAN/NBS Survey, 2013). The study employed Taro Yamane formula from 1967 to determine the 400 sample size of the study. The study adopted questionnaire as the research instrument and it was administered to 400 MSMEs owners in Lagos State using a simple random sampling technique. However, 297 copies of questionnaire were retrieved from the respondents, which represents 74.3% of the sample size. The questionnaire was self-developed and the items in the questionnaire were ranked on 1 to 5 Likert scale from strongly disagree to strongly agree.

Questions were asked on the challenges MSMEs have encountered during Covid-19 era and include decline in productivity, business closure, supply chain breakdown, low customer demand and self-isolation. Also, the questionnaire covered the strategic options for survival which are management response, and cutting of expenses. The Cronbach reliability coefficient test result of the instrument was of 0.95 for challenges of MSMEs in Covid-19 and strategic options for survival has reliability value of 0.85 and they are all above the benchmark of 0.70 showing a high level of reliability. The study adopted descriptive statistics and regression analysis. The descriptive statistics was used to describe the demographic details of the respondents as well as the strategic options for survival using the bar chart while simple regression was used to ascertain the challenges of MSMEs in Covid-19 era.

4. DATA ANALYSIS AND INTERPRETATION

Hypothesis: There is no significant effect of MSMEs Covid-19 challenges (decline in productivity, business closure, supply chain breakdown, low customer demand and self-isolation) on business survival.

Table 1. Regression results between MSMEs Covid-19 challenges and business survival

Independent Variable	Coefficient	Std. Error	T-statistic	Probability
C	-6.871	1.279	-5.770	0.103
MSMEs Covid-19 Challenges	-2.927	2.380	-1.186	0.222
R-Square	0.023		F-Statistic	1.407
Adjusted R-Squared	0.008		Prob(F-Statistic)	0.222

Dependent Variable: Business Survival

Source: Author's computation, 2020

The above indicates the regression analysis between MSMEs Covid-19 challenges (decline in productivity, business closure, supply chain breakdown, low customer demand and self-isolation) and business survival. It was indicated that the coefficient of multiple determination (R^2) is 0.023 which means that 2.3% of the changes in business survival are explained by MSMEs Covid-19 challenges (decline in productivity, business closure, supply chain breakdown, low customer demand and self-isolation). The results showed that there is a negative and insignificant effect of (β =--2.927; t-statistic= -1.183; P-value=0.222). The results also confirmed that MSMEs Covid-19 challenges such as decline in productivity, business closure, supply chain breakdown, low customer demand and self-isolation do not have a significant impact on business survival (F-Statistic = 1.407; Prob (F-Statistic) = 0.222). Therefore, the hypothesis that there is no significant effect of MSMEs Covid-19 challenges on business survival is accepted.

To determine the strategic options for survival that are employed by the owners of MSMEs, the responses of the respondents are demonstrated as thus:

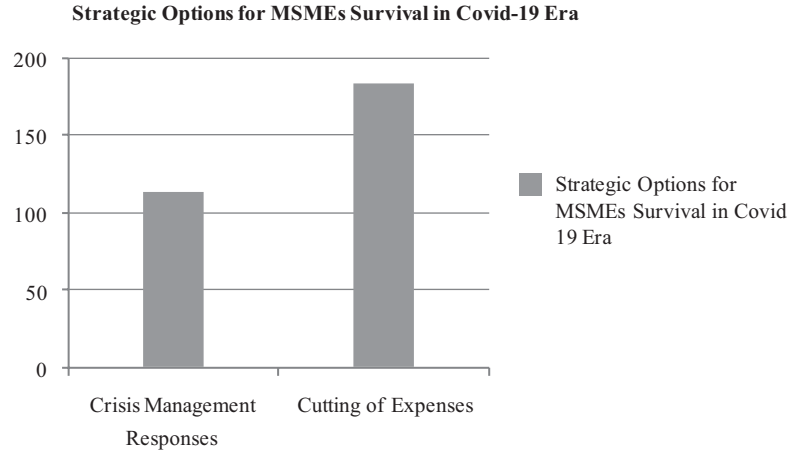


Figure 1. Survival Options for MSMEs in Covid-19 Era.
Source: Author's computation, 2020

Figure 1 shows the graphical representation of the MSMEs owners' responses to the strategic options survival in Covid-19 era. It was indicated that 113 (38.1%) of the respondents employed crisis management response as strategic options for survival in Covid-19 era. While 184 (61.9%) of the respondents adopted the strategic options for cutting expenses in Covid-19 era. This showed that most of the owners of MSMEs are cutting down expenses incurred in Covid-19 period.

5. DISCUSSION OF FINDINGS

It is evidenced that the challenges Covid-19 brought to Nigerian business environment is making it very hard and difficult for MSMEs to survive. When a business struggles to survive, such business cannot grow. Therefore, Covid-19 is an occurrence that is crippling business activities in Lagos State, Nigeria, because it has brought challenges of decline in productivity, business closure, supply chain breakdown, low customer demand and self-isolation. A rise in the number of Covid-19 cases could force the government to review its policy and directive on the movement of the people which would affect the production activities, resulting in business closure, breakdown in supply chain and low customer demand. It is further indicated that MSMEs owners believe that the best approach they can employ to mitigate Covid-19 challenges is through cutting expenses. Consequently, MSMEs owners attempt to reduce the cost of doing their business or the cost of business operations and that is the reason why the level of unemployment in both formal and informal sector in Nigeria is high.

6. CONCLUSIONS AND RECOMMENDATIONS

The present MSMEs operational techniques may not be able to handle coronavirus pandemic effectively due to its spreading across countries of the world. Hence, business enterprises need to embark on the following recommended survival strategic options to remain competitive: new normal business strategies, digital business model and e-commerce, work from home, local supply chains, customer value that customer is first, credit, knowledge worker management, government support, tax relief or holiday, wage subsidy, enterprises pivot, focus on retaining existing customers, introduction of effective online service delivery, provision of service differentiation strategy, reduction in product lines to manageable sizes, advertising on social media, creativity, belonging to a relevant business group, engagement of employees using videoconferencing, frequent review of business strategies, focus on factual and effective communication with stakeholders, and minimising the risk of business disruptions.

REFERENCES

Abulescu, C. (2020). *Coronavirus and financial volatility: 40 days of fasting and fear*. Cornell University. arXiv preprint arXiv:2003.04005.

Afi. (2017). *Alliance for financial inclusion*. Retrieved from: www.afi-global.org

African Heroes. (2020). *Micro, Small, and Medium Enterprises (MSMEs) in Nigeria – An Overview*. Retrieved from: https://afrikanheroes.com/

Ajibo, H. (2020). Effect of Covid-19 on Nigerian Socio-economic Well-being, Health Sector Pandemic Preparedness and the role of Nigerian Social Workers in the war against Covid-19. *Social Work in Public Health, 35*(7), 511-522. Doi: 10.1080/19371918.2020.1806168

Akingbade, W.A. (2020). Service Differentiation Strategy and Organizational Performance of Nigeria Small and Medium Enterprises in Lagos State. *International Journal of Economic Behaviour, 10*(1), 21-33.

Aladejebi, O. (2020). Managing Small Businesses in Nigeria during Covid-19 crisis: Impact and survival strategies. *IOSR Journal of Business and Management, 22* (8), 24-34.

Asia-Pacific MSME Trade Coalition. (2020). *COVID-19 SME Impact Survey. COV-ID-19 Impact Survey*. Asia Business Trade Association.

Audretsch, D.B. (2015). *Everything in its place: Entrepreneurship and the strategic Management of Cities, Regions, and States*. Oxford, UK: Oxford University Press

Autio, E., Kenney, M., Mustar, P., Siegel, D., & Wright, M. (2014). Entrepreneurial innovation: The importance of context. *Research Policy, 43*(7), 1097-1108. Doi:10.1016/j.respol.2014.01.015

Baumol, W. (2015). Joseph Schumpeter: The long run, and the short. Journal of Evolutionary Economics. *Springer 25*(1), 37-43. Doi: 10.1007/S00191-013-0327-3

Bogliacino, F., & Pianta, M. (2013). Profits, research, development, and innovation: A model and a test. *Industrial and Corporate change, 22*(3), 649-678.

Boseley, S., Devlin, H., & Belam, M. (2020). *Coronavirus symptoms: What are they and should I see a doctor?* Retrieved from: https//muckrack.com

Bourletidis, K., & Triantafyllopoulos, Y. (2014). SMEs Survival in time of crisis: Strategies, tactics and commercial success stories. *Procedia-Social and Behavioural Sciences, 148*, 639-644. www.sciencedirect.com

CDC. (2020b). *Symptoms*. Retrieved from http://www.cdc.gov/coronavirus/2019-ncov/symptoms.html

CDC. (2020c). *Coronavirus disease 2019* (COVID-19). Retrieved from http://www.cdc.gov/coronavirus-ncov/prepare/prevention.html

Dorin, C., & Alexandra, G.S. (2014). Dynamics of the entrepreneurship concept: Literature review. *The annals of the University of Oradea, 23*(1), 443-451.

Fitriasari, F. (2020). How do small and medium enterprises survive the COVID-19 outbreak? *Jurnal Inovasi Ekonomi, 5*(2), 53-62.

IMF. International Monetary Fund. (2020). Retrieved from: https://imf.org

International trade centre. (2020). Retrieved from: www.itc.org

Johnson, N.P., & Mueller, J. (2002). Updating the accounts: global morality of the1918-1920 Spanish influenza Pandemic. *Bull Hist Med. 76*, 105-115.

Kain, T., & Fowler, R. (2019). Preparing intensive care for the next Pandemic influenza. *Critical Care, 23,* 337.

Kale, Y. (2019). *Public Presentation of the 2017 NBS-SMEDAN Small and Medium Enterprises Development*. Agency of Nigeria (SMEDAN). National Survey of Micro, Small and Medium Enterprise (MSMEs), Report held in Lagos.

Konstantakis, K., Michaelides, P.G., & Papageorgiou, T. (2014). Sector size, technical change and stability in USA (1957-2006): A Schumpeterian approach. *International Journal of Social Economics, 41*(10).

Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., & Tong, Y. (2020). Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *The new England Journal of Medicine, 382*(13), 1199-1207. Doi:10.1056/NEJMoa2001316

Liu, Y., Kuo, R., & Shih, S. (2020). COVID-19: The first documented coronavirus Pandemic in history. *Biomed Journal, 43*(4), 328-333. Doi: 10.1016/j.bj.2020.04.007

National agency for food and drug administration and control. (2021). NAFDAC approves COVID-19 *vaccine*. Retrieved from: www.nafdac.gov.ng

NCDC. (2021). Nigeria Centre for Disease Control. Retrieved from: www.ncdc.com

Ogundele, O.J.K. (2012). Introduction to Entrepreneurship Development, Corporate Governance and Small Business Management. (2nd ed.) Lagos, Nigeria: Molofin Nominess.

Pak, A., Adegboye, O.A., Adekunle, A.I., Rahman, K.M., McBryde, E.S., & Eisen, D.P. (2020). Economic Consequences of the COVID-19 outbreak: The need for Epidemic Preparedness. *Frontiers in Public Health, 8*(241), Doi:10.3389/fpubh.2020.00241

PWC. (2020). COVID-19: Impacts on Business. Retrieved from: www. pwc.com

Schumpeter, J.A. (2012). Schumpeter's theory of Economic Development: 100 years of development. *Journal of Evolutionary Economics, 22*(5), 917-933.

Simonsen, L., Clarke, M.J., Schonberger, L.B., Arden, N.H., Cox, N.J., & Fukuda, K. (1998). Pandemic versus epidemic influenza mortality: a pattern of changing age distribution. *Journal of Infect Disease, 178*, 53-60 .

SMEDAN & NBS. (2013). *Small and Medium Enterprises Development Agency of Nigeria and National Bureau of Statistics Collaborative Survey: Selected findings*. Retrieved from: https://www.smedan.gov.ng/images/PDF/2013-MSME-Survey-Summary-Report.pdf

Udoh, C.R. (2020). Africa, Enterprises, Micro, Nigeria, Small & Medium, Small Businesses Retrived from: https://web.facebook.com/Afrikanheroes/

US Bureau of labour statistics. (2016). Retrieved from: https://www.bls.gov/bls/glossary.htm

Vandenberg, P. & Helble, M. (2020). *Three Ways to Support Businesses and Their Workers during a Pandemic.* Asian Development Blog.

Vandenberg, P. (2020). *Bouncing Back Support to SMEs for COVID-19 Recovery*. Presented at the Policy Actions for COVID-19 Economic Recovery Dialogues of the Asian Development Bank.

Viboud, C., Simonsen, L., Fuentes, R., Flores, J., Miller, M.A., & Chowell, G. (2016). Global moralityimpact of the 1957-1959 influenza Pandemic. *Journal of Infectious Disease, 213,* 738-745

WHO (2020b). World Health Organization. Retrieved from: https://covid19.who.int

WHO. (2021). World Health Organization. Retrieved from: https://covid19.who.int

World Bank. (2014). *Building Competitive Green Industries: The Climate and Clean Technology Opportunity for Developing Countries*. Retrieved from: https://openknowledge.worldbank.org/handle/10986/20684

Yamane, T. (1967). *Statistics: An Introductory Analysis*, 2nd Edition. New York, USA: Harper and Row.

Yamey, G., Schaferhoff, M., Aars, O.K.. Bloom, B., Carroll, D., Chawla, M. (2017). Financing of International collective action for epidemic and Pandemic preparedness. *Lancet Global Health, 5,* 742-4, Doi:10.1016/52214-109X(17)

Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., & Song, J.A. (2019). A novel coronavirus from patients with pneumonia in China. *N Engl Med, 382*,727-733.

ПАНДЕМИЈСКИ ИЗАЗОВИ КОВИДА 19 ЗА НИГЕРИЈСКА МИКРО, МАЛА И СРЕДЊА ПРЕДУЗЕЋА: СТРАТЕШКЕ ОПЦИЈЕ ЗА ОПСТАНАК

[1] Ваиди Аденији Акингбаде, Економски факултет, Одсјек за пословну администрацију, Универзитет у Лагосу, Ојо, Лагос, Нигерија

САЖЕТАК

Пандемија изазвана вирусом корона представља велику пријетњу и изазове за пословни свијет, посебно микро, мала и средња предузећа (МСП). Многа од ових предузећа претрпјела су велики пад пословних активности и смањење добити. Многа предузећа су била присиљена да обуставе пословање, док су друга преживљавала на маргини. Влада и друге заинтересоване стране за МСП су обезбиједиле рјешења за ове проблеме, али већина њих заправо није дала жељене резултате. Овај рад истражује изазове са којима су се МСП у држави Лагос сусретала, као и стратешке опције за њихов опстанак током ове пандемије. Усвојен је модел анкетног истраживања и примарни подаци су прикупљени уз помоћ упитника. Популација студије је 3.224.324 регистрованих МСП у држави Лагос, док је величина узорка од 400 утврђена помоћу Јаманове (1967) формуле. Примијењена је једноставна техника случајног узорковања за 400 примјерака упитника, од којих је 297 правилно попуњено и враћено. Налази из регресионе анализе и дескриптивне статистике открили су да не постоји значајан ефекат изазова ковида19 на опстанак пословања за МСП (као што су: пад продуктивности, затварање предузећа, распад ланца снабдијевања, ниска потражња купаца, смањење добити, самоизолација, смањене могућности за привлачење нових клијената). Такође, откривено је да је већина испитаника усвојила смањење трошкова као стратешку опцију за опстанак пословања. Студија

закључује да је пандемија изазвана вирусом корона тренутно ипак главна пријетња за опстанак и раст МСП. Препорука је да МСП смањују трошкове како би преживјели период пандемије, а надаље, треба да почну да управљају кризом, финансијама и ликвидношћу, радом и ланцима снабдијевања, да утврде и активирају план континуитета пословања и надгледају његово спровођење како би побољшали шансе за опстанак и прилагодили се захтјевима за очување животне средине.

Кључне ријечи: *пандемија изазвана вирусом корона, одговор кризног управљања, економски пад, МСП, стратегија преживљавања.*

CLIMATE CHANGE AND ECONOMY IN NIGERIA: A QUANTITATIVE APPROACH

1 Adejumo Musibau Ojo, University of Lagos, Department of Economics, Nigeria
*Corresponding author e-mail: adejumoeco@gmail.com
1 ORCID ID: 0000-0002-0092-4794

ARTICLE INFO

Review Scientific Paper
Received: 23.01.2021
Revised: 23.04.2021
Accepted: 25.04.2021

doi 10.7251/ACE2134169M
UDC
502.131.1:330.101.541(669)

Keywords:
economic growth, global warming, carbon dioxide, climate change

JEL Classification: O44,Q56

ABSTRACT

This study has examined the potential impacts of climate change on Nigerian economic growth using a time series data (1980-2017). In doing so, an econometric model has been constructed based on theoretical and empirical literatures of the climate change economics, then it has employed a growth model adapted from the Solow growth model. The research work found that annual average rainfall has a significant effect on economic growth both short-run and long-run. Also, there is a high degree of positive and significant relationship between carbon emission, foreign direct investment, gross fixed capital formation and economic growth under investigation. The result also revealed that this relationship between climatic factors and economic growth is more noticeable in the long run. In addition, an inverse relationship was found between forest depletion, population growth and economic growth in the long run. Finally, there is unidirectional causality between annual average rainfall and economic growth in Nigeria. It is therefore recommended that the stakeholders and the general public should build green economy that enables sinking carbon and promotes carbon market in the long-run.

1. INTRODUCTION

Climate change poses a major threat to poverty reduction and sustainable development worldwide, especially in developed countries (Nigeria inclusive). Nigeria has a vast population that is directly dependent on climate-sensitive economic and development sectors (agriculture and fisheries) as well as natural resources (such as water, biodiversity, and grassland) for sustenance and subsistence (Fadairo et al., 2020). Furthermore, the rural majority's adaptation ability to climate change impacts is very limited. Unfortunately, several of the country's new growth plans seem to underestimate climate change threats. The risks of failing

to mitigate climate change or respond to it remain unknown, but the welfare implications are likely to be immense (Stiglitz, 2019).

Nigerians live on the front lines of pollution, disaster, and degradation of resources and land. Unfortunately, despite growing concern, no precise and reliable figures are available to measure the economic costs of negative impacts of climate change in Nigeria for individuals or society as a whole. As far as development is concerned, climate change has had a significant effect on Nigeria's ability to achieve overall economic growth and sustainability, putting additional strain on agriculture, water supply and demand, health, and political stability. (Ikhuoso et al., 2020). Climate change is today being recast as a security threat, rather than being just an environmental issue. Increasing energy consumption contributes to global warming. The economies face a host of environmental problems as a result of climate change which have a greater impact on their economic well-being. The nation is marked by a brutal cycle of poverty, desert encroachment, flood, and CO2 emissions that have caused extensive harm to homes and facilities, displaced hundreds of families, and resulted in significant livestock losses and food insecurity.

The empirical evidence on this debate is of much relevance to growth and environmental policies in the developing world, more so in Sub-Sahara Africa (SSA) where income levels are below acceptable standards. Ensuring sustained long-run growth and environmental sustainability requires prior establishment of the nexus between economic growth and climate change. Recent attention has shifted to the pair-wise nexuses between climate change and economic growth, economic growth and emissions, and emissions and climate change. However, a huge gap remains, particularly, in the empirical link between economic growth and climate change. This study looks at the effect of climate change on sustainable growth in Nigeria using time series cointegration modelling techniques. The study explores and analyzes the effects of climate change on economic growth. None of the previous studies had considered the problem of endogeneity facing time series data. The novelty of the empirical contribution is that the study employs Autoregressive Distributive Lag (ARDL) method of estimation. This Method is superior because it accommodates the problems of autocorrelation and heteroskedasticity that may exist among the variables employed and their residual.

Finding of the study will provide useful insights for policymakers and academics into climate change risk. For policymakers in Nigeria, this work becomes important because it provides empirical evidence to support the provision of adaptation efforts to moderate the impact of climate change which could affect shared growth. Therefore, the empirical verification of the moderating role of adaptive

capacity to climate change impact on economic growth is critical. The outcome of the study will lend support to the pursuit of adaptation strategies to be based more on evidence than guesswork. For academia, this research adds to literature by granting the academic community a better insight into the link between climate change and economic growth as well as open up discussion in this light that provokes thoughts and ideas to support Nigeria's economic growth agenda.

This study is structured into four sections: section one covered the introductory part, section two addressed the materials and method, section three covered the empirical results of the findings, while section four detailed conclusion and recommendations.

2. MATERIALS AND METHODS

2.1. Theoretical model

To analyze the impacts of climate change on economic growth two types of approaches are most widely used, that is, enumerative approach and dynamic approach. In the enumerative approach the economic impacts of climate change are analyzed separately sector by sector, that is, impacts of climate change on agriculture, ecosystem tourism, etc. Later these effects are added up to obtain an estimate of total change in the social welfare from climate change **(**Ahmed, 2020). In this approach, ARDL models and simulation techniques are mostly used.

In dynamic approach, different specifications of growth models are used by incorporating climate change indicators into growth models. Liu, Huang and Yang, (2020), Khan, Yu, Sharif and Golpîra (2020) are most widely used growth models to analyze the impacts of climate change on economic growth. In these models the impacts of climate change are directly linked to GDP.

The present study will use both of these approaches to some extent and analyze the impacts of climate change on economic growth and its components, that is, agriculture, manufacturing and services. Guntukula and Goyari, (2020) incorporated climate change in the production function, and this model will be used as baseline in the present study because it provides theoretical basis for incorporating climate change into economic growth equations. Consider the production function.

$$Y_t = e^{\alpha T_t}, A_t, L_t, K_t \tag{1}$$

$$\frac{\Delta A_t}{A_t} = \beta T_t \tag{2}$$

Where Y is GDP, L is labor force, A is technology and can also be referred as a labor productivity, and T is the impacts of climate and K is physical capital. Equation (1) captures direct effects of climate change on economic growth. While equation (2) captures the indirect effect of climate, that is, the impact of climate on other variables that indirectly influence the GDP growth. It is worth mentioning here that the equation (1) directly relates climate change to GDP whereas in the equation (2) climate changes affect labour productivity that will affect the GDP growth. After taking logs of equation (1) and differencing with respect to time, the following equation can be derived.

$$g_t = (\alpha + \beta) T_t - \alpha T_{t-1} \tag{3}$$

Where gt is the growth rate of GDP, direct effects of climate change on economic growth appear through α and indirect effects appear through β. This equation separately identifies the direct and indirect effects of climate change. Both of these affect GDP growth rate in the initial period. However, when climate returns to its prior state then direct effect reverses itself. For example, a rise in temperature may harm agricultural production, but whenever temperature returns to its normal level the agricultural production once again accelerates. On the other hand, indirect effect emerges during the climatic shock and their impact persists even in the normal conditions: for example, a failure in human capital development results in a permanent deterioration in human capital and economic growth.

2.2. Model Specification and Data Availability

The study used secondary time series dataset which poses some challenges. The presence of non-stationary macroeconomic variable and variables with long time dimension subject the regression to spurious results and according to Castle, Doornik and Hendry, (2020), the presence of non-stationary variables abounds. The presence of non-stationarity makes forecasting and predicting difficult. The extension of time series data helps deal with issues of non-stationarity and cointegration Castle, Doornik and Hendry, (2020). In the analysis for cointegration, the study checked for unit root and cointegration and then estimated the long run and short run relationship.

The data is fitted to an autoregressive model on the premise that (i) the current values of the dependent variable could depend on a linear combination of its past values as well as (ii) the past values are distributed across time in the past. Following from the aforementioned, the study therefore uses Autoregressive Distributed Lag model which allows the study to include the lagged values of both the dependent (GDPgr) and independent variable(s) (C02, FRD, AAR,

FDI, GFCF, POP). The ARDL model allows for flexibility which makes it possible to use variables integrated of different order except for 1(2) (Pata and Aydin, (2020)). Autoregressive Distributed Lag (ARDL) models:

$$GDPgr_t = \beta_0 + \beta_1 GDPgr_{t-1} + \beta_2 C02_{t-1} + \beta_3 FDI_{t-1} + \beta_4 GFCF_{t-1} + \beta_5 POP_{t-1} + \sum_{j=1}^{q} \gamma_1 GDPgr_t + \sum_{j=1}^{p} \gamma_2 C02_t + \sum_{j=1}^{p} \gamma_3 FDI_t + \sum_{j=1}^{p} \gamma_4 GFCF_t + \sum_{j=1}^{p} \gamma_5 POP_t + \alpha_t + \varepsilon_t \quad (4)$$

$$GDPgr_t = \beta_0 + \beta_1 GDPgr_{t-1} + \beta_2 FRD_{t-1} + \beta_3 FDI_{t-1} + \beta_4 GFCF_{t-1} + \beta_5 POP_{t-1} + \sum_{j=1}^{q} \gamma_1 GDPgr_t + \sum_{j=1}^{p} \gamma_2 FRD_t + \sum_{j=1}^{p} \gamma_3 FDI_t + \sum_{j=1}^{p} \gamma_4 GFCF_t + \sum_{j=1}^{p} \gamma_5 POP_t + \alpha_t + \varepsilon_t \quad (5)$$

$$GDPgr_t = \beta_0 + \beta_1 GDPgr_{t-1} + \beta_2 AAR_{t-1} + \beta_3 FDI_{t-1} + \beta_4 GFCF_{t-1} + \beta_5 POP_{t-1} + \sum_{j=1}^{q} \gamma_1 GDPgr_t + \sum_{j=1}^{p} \gamma_2 AAR_t + \sum_{j=1}^{p} \gamma_3 FDI_t + \sum_{j=1}^{p} \gamma_4 GFCF_t + \sum_{j=1}^{p} \gamma_5 POP_t + \alpha_t + \varepsilon_t \quad (6)$$

$GDPgr_t$ is the dependent variable denoting economic growth that captures key indicators. The explanatory variable C02, FRD and AAR represent climate change measured by CO2 emissions for meteorological a year, Forest Depletion and Average Total Annual Rainfall respectively. The following are control variables that have the potential of augmenting growth: FDI is the foreign direct investment measured by FDI inflows as a percentage of GDP; GFCF is the gross capital formation which captures investment; POP is the population outcome measured by the population of age 15-64 as a percentage of total population; α_t is time fixed effects and ε_t is the disturbance term of the equation.

Data is sourced for the study from the World Development Indicators (WDI), Food and Agriculture Organization (FAO). The data collected are annual data for a 27 year period from 1990 to 2017 for Nigeria. Data from these sources are combined to carry out this study.

This study adopts Autoregressive Distributed Lag (ARDL) regression method to analyze the impact of climate change on economic growth. In the process of analyzing the data to test the research hypotheses and draw valid conclusion, the

model regresses the dependent variable (Gross Domestic Product growth rate) on the independent variables (C02, FRD, AAR, FDI, GFCF, POP).

3. RESULTS AND DISCUSSIONS

The primary aim of this research is to empirically examine the association between economic growth and climate change in Nigeria, and thus provide some illuminating data on the validity of the Environmental Kuznets Curve (EKC) hypothesis. As is conventional in empirical studies such as this one, some data evaluation and testing analysis will be pertinent in order to ensure that the empirical estimates obtained in this way are empirically valid and reliable. Hence, as earlier stated in this section, the first test exercise is the unit root test analysis which is presented in Table 1 below:

3.1. Unit Root Test Results

The unit root test methods utilized for the purpose of evaluating the stationarity property of the series employed for this study are those that have been widely employed in empirical analysis such as ours. Specifically, Augmented Dickey Fuller (ADF) and Phillip Perron (PP) are the basic criteria that have been used in this study because of their widespread application in previous empirical studies. The result of the unit root test based on the ADF and the PP methods is presented in Table 1 below:

Table 1. Unit Root Test Results

Variables	Augmented Dickey-Fuller (ADF) Test		Phillip Perron (PP) Test		Conclusion on the Order of Integration	
	Levels	1st Diff.	Levels	1st Diff.	Levels I(0)	1st Diff. I(1)
GDPGR	-4.610936 (0.0007)	-6.773221 (0.0000)	-4.618533 (0.0007)	-18.93011 (0.0001)	Yes	Yes
CO2	-1.402121 (0.5708)	-6.043997 (0.0000)	-1.402121 (0.5708)	-6.049457 (0.0000)	No	Yes
FRD	-2.021680 (0.2766)	-8.762324 (0.0000)	-2.625393 (0.0971)	-8.762324 (0.0000)	No	Yes
AAR	-1.628193 (0.4585)	-6.168916 (0.0000)	-1.613470 (0.4658)	-6.189276 (0.0000)	No	Yes
FDI	-3.667886 (0.0089)	-8.417580 (0.0000)	-3.635817 (0.0096)	-13.76205 (0.0000)	Yes	Yes
POP	-3.039933 (0.0406)	-8.009122 (0.0000)	-3.655226 (0.0092)	-4.329672 (0.0016)	Yes	Yes
GFCF	-5.086443 (0.0002)	-9.928455 (0.0000)	-5.062003 (0.0002)	-10.14736 (0.0000)	Yes	Yes

Source: Author's computation (2021).

The unit root test is carried out with constant and trend specifications for the respective series. The lag-selection was based on the default selection of the Akaike-Information Criterion (AIC). The table contains the ADF and the PP test statistic at levels and first difference of the time series. The numbers in the brackets represent the probability values of the estimate test statistic of the ADF and PP tests.

The unit root test result from the ADF and PP methods shows that the order of integrations mixed with some of the variables being stationary at levels and first difference at the same time. In particular the stationarity of the general unit root process for the set of time series data for the variables shows that they are all significant at least at the 5 percent level for the first difference of all variables and thus the null hypothesis of unit root in the data cannot be upheld.

3.2. Lag Selection Criteria Result

In view of the unit root test result, some empirical investigation on the Lag selection of the model can be examined. The output of the result will assist to determine the best lag selection for the model. The intuition behind this is that the criteria that produce the minimum value is the best lag for the model.

Table 2. Model Selection Criteria Table

VAR Lag Order Selection Criteria
Endogenous variables: GDPGR
Exogenous variables: C CO2 FRD AAR FDI GFCF POP
Date: 01/18/21 Time: 20:53
Sample: 1980 2017
Included observations: 35

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-112.0523	NA*	53.01520*	6.802991*	7.114060*	6.910372*
1	-111.9195	0.204975	55.86205	6.852542	7.208050	6.975263
2	-111.4625	0.678957	57.82963	6.883571	7.283518	7.021633
3	-111.0542	0.583259	60.09127	6.917383	7.361769	7.070785

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Author's computation (2021).

The results of the test for the respective equation specifications are contained in Table 2 above. As evident from Table 2, three criteria were examined for the models (Akaike info criterion (AIC), Schwarz criterion (SC) and Hannan-Quinn criterion (HQ). By simple examining the result of the lag selection between three criteria, it is clearly shown that Akaike Info Criterion produced the minimum values and it is significant at lag zero through the model selection. Hence AIC lag zero will be used throughout the period of investigation in this study.

3.3. ARDL Bound Test

In view of the unit root test result, some empirical investigation on the long-run relationship in the model can be examined. Though the unit root test does not strictly satisfy the condition for embarking on a Bound Test, doing this will help establish if any of the sets of variables may be cointegrated. The most prominent and widely used technique for ARDL model in the literature has been that developed by Pesarant (2011) as cited by Dhungel, (2012)

Table 3. ARDL Bound Test Result

ARDL Bounds Test
Date: 01/18/21 Time: 22:04
Sample: 1981 2017
Included observations: 37
Null hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	7.873040	6
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Source: Author's computation (2021).

From the result, the F statistic value is greater than the bound values at different significance levels. Hence, we reject the null hypothesis of no cointegration among variables in the long run. With this result, Error Correction Model will be employed for general estimation of this model.

3.4. Serial Correlation Test

Table 4. Breusch-Godfrey Serial Correlation LM Test

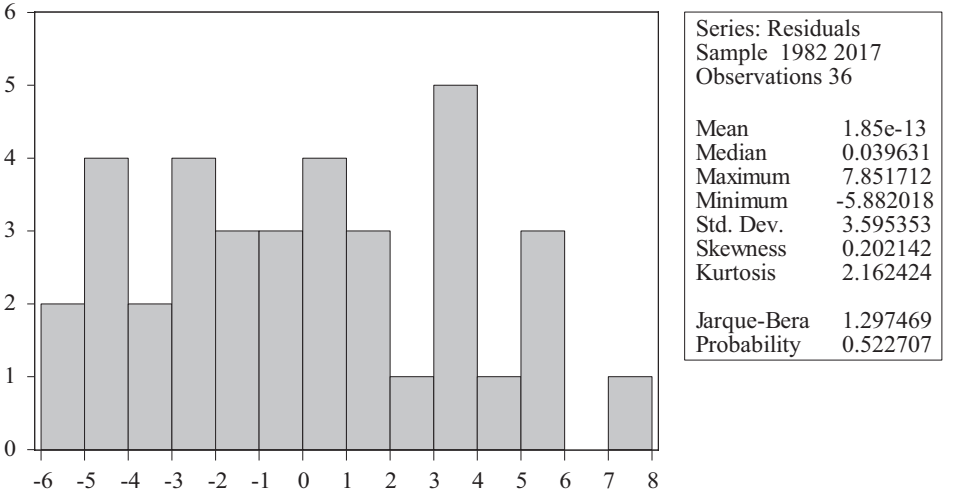
Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.689177	Prob. F(2,24)	0.0883
Obs*R-squared	6.773664	Prob. Chi-Square(2)	0.0338

Source: Author's computation (2021).

The result revealed that the model is free from the problem of serial correlation since F statistic probability is greater than 5% level of significance.

3.5. Normality Test

Figure 1. Normality Test of the Model



Source: Author's computation (2021)

The figure 1 above depicts the normality of the model over the period of investigation. From the result, the model mean value is 1.85, jarque Bera value of 1.297469 with probability value of 0.522707. The null hypothesis states that the model is normally distributed. From the result, the probability value is greater than 5% level of significance, hence we fail to reject null hypothesis. Therefore, we conclude that the model is normally distributed over the period of investigation.

3.6. Stability Test

Before proceeding to ARDL estimation, the study has to verify the model's stability, which is checked by Ramsey Reset test. The results confirm stability of the model at 5% significance level.

Table 5. Stability Test

Ramsey RESET Test
Equation: UNTITLED
Specification: GDPGR GDPGR(-1) CO2 CO2(-1) CO2(-2) FRD FRD(-1) FRD(-2) AAR AAR(-1) AAR(-2) FDI GFCF GFCF(-1) POP POP(-1) POP(-2) C
Omitted variables: Squares of fitted values

	Value	Df	Probability
t-statistic	1.582400	18	0.1310
F-statistic	2.503990	(1, 18)	0.1310
F-test summary:			
	Sum of Sq.	Df	Mean Squares
Test SSR	55.25165	1	55.25165
Restricted SSR	452.4297	19	23.81209
Unrestricted SSR	397.1781	18	22.06545

Source: Author's computation (2021)

The stability of the model was examined. The result revealed that the null hypothesis of no stability was rejected since the probability of F statistic was greater than 5% level of significance. Hence, we conclude that the model is stable.

3.7. Heteroscedasticity Test

One of the unlined assumptions of linear regression is constant variance of the model (Homoscedasticity) violation of this assumption can lead to bias estimation of the model parameters. To validate this assumption, this study checked the heteroscedasticity of the model using the Breusch-Pagan-Godfrey approach and the result is presented below:

Table 6. Heteroscedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.944270	Prob. F(16,19)	0.0838
Obs*R-squared	22.34957	Prob. Chi-Square(16)	0.1323
Scaled explained SS	3.618313	Prob. Chi-Square(16)	0.9994

Source: Author's computation (2021)

From the result, the F statistic value of 1.944270 and probability value of 0.0838 shows that the null hypothesis of no heteroscedasticity cannot be rejected since the probability value of 0.0838 is greater than 5% level of significance. Hence, the assumption of constant variance is valid for the model.

3.8. Parsimonious Error Correction Estimates

Having established the fact that some of the explanatory variables in the model do have long-run relationship with the dependent variable it would be relevant also to examine the direction of and magnitude impact of the relationship between private consumption and the set of explanatory variables captured in the model. In this sense the aim is to obtain empirical estimates measuring the impact of regressors on the dependent variable.

For this purpose the Autoregressive Distributed Lag (ARDL) is employed for the estimation. The ARDL is a long-run parameter estimation method in which the steady state converging relationship can be evaluated and examined based on the parameter estimates obtained from the estimation exercise.

The result of the regression analysis is shown in Table 7 below. The table contains the parameter estimates obtained from the ARDL estimation approach. The variables are estimated in their growth form for purpose of data demeaning and to avoid outliers which can lead to heteroscedasticity problems.

In the table the values in the brackets are the probability values of the parameter estimates of the model. The last two columns to the right show the conclusion on the sign and test of significance of the parameter estimates of the variables. The negative or positive sign indicates negative or positive impacts of the explanatory variable on the dependent variable respectively. The significance of the estimated coefficients is tested from the probability value of the estimated coefficients. If the probability value of the estimated coefficient is less than 5 percent then the explanatory variable has a significant impact on the dependent variable. Hence the research hypothesis cannot be upheld.

The above result depicts the long run and short run equations of the model. From the result in the short run, it shows that climate change has a significant impact on economic growth.

In the long run, carbon emission (C02) has a significant positive relation with private economic growth. Only 1% point increase in carbon emission (C02) leads to 16.42% increase in economic growth in Nigeria. This result does not conform to prior expectation and this could be as a result of over reliance on the use of fossil fuel for productive activities. It is quite cleared that carbon emission is not an important determinants of economic growth in the long run.

Table 7. Parsimonious Error Correction Estimates

Dependent Variable: GDPGR
Method: Least Squares
Date: 01/17/21 Time: 03:31
Sample (adjusted): 1981 2017
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	38.79219	0.909986	42.62943	0.0000
CO2	16.42091	0.159115	103.2014	0.0000
FRD	-1.000193	0.022967	-43.54903	0.0000
AAR	2.447295	0.009802	249.6608	0.0000
FDI	0.109104	0.010010	10.89965	0.0000
GFCF	0.005914	0.000778	7.599790	0.0000
POP	-25.24830	0.340449	-74.16167	0.0000
ECM	1.000000	0.002612	382.9039	0.0000
R-squared	0.999874	Mean dependent var.		3.451011
Adjusted R-squared	0.999843	S.D. dependent var.		7.519255
S.E. of regression	0.094216	Akaike info criterion		-1.697641
Sum squared resid.	0.257424	Schwarz criterion		-1.349334
Log likelihood	39.40635	Hannan-Quinn criter.		-1.574846
F-statistic	32752.83	Durbin-Watson stat		1.903131
Prob(F-statistic)	0.000000			

Source: Author's computation (2021).

Forest depletion (FRD) has a significant negative relation with economic growth in the long run. The result also conforms to prior expectation. However, 1% point increase in forest depletion will lead to 1.00% decrease in economic growth. Hence, it becomes clear that forest depletion in an important variable determining economic growth in the long run.

Annual average rainfall is also an important determinant of economic growth in Nigeria. From the result, 1% increase in annual average rainfall will lead to about 2.45% increase in economic growth. The result also conforms to prior expectation and it is significant at 5% level of significance. Hence, it becomes clear that annual average rainfall is an important determinant. This result depicts that Nigerian relied on annual rainfall for her endowed agricultural activities since the sector accounting for more than 60% of her GDP.

Foreign direct investment that captured the foreign investment in the economy depicts a direct relationship with economic growth. From the result, 1% increase in foreign direct investment (FDI) will lead to about 0.11% increase in economic growth and such relation is significant in the long run.

Gross Fixed Capital Formation (GCFC) and population growth (POP) show that they are important determinants affecting economic growth in the long run. From the result, 1% point increase in capital formation will lead to about 0.06 % increase in economic growth. Also, population depicts an inverse relation with economic growth and the impact is significant at that period of investigation. Hence, this result justifies the reality of Malthusian Theory of Population in Nigeria. The R^2 statistics shows that explanatory variables accounted for 99% variation of economic growth in the long run. This is supported by higher adjusted R^2 value of 99%. Also, the Durbin Waston Statistics value of 1.903131 falls within the rejection region of absence of serial correlation among the regressors.

The Akaike info criterion, Schwarz criterion and Hannan-Quinn criterion value of -1.697641, -1.349334 and -1.579846 respectively indicate that the model selection is good.

3.9. Causality Test

Having established the magnitude of the impact of the set of explanatory variables that entered the regression equation the study proceeds further to investigate nature of causality among the variables paying particular attention to the causality of the government expenditure variable and private consumption. The causality test is carried out using the growth rate of the variables, using the one lag-length as stipulated by the Akaike Information Criteria (AIC). The test method is the Stacked test method with common coefficients. The hypothesis testing procedure follows similar procedures as stated in order aspects in this study. The result of the causality test is contained in Table 8. The arrows in between the variables indicate the hypothesized direction of causality while the asterisks *** and ** denote the asymptotic significance of the F-test statistic.

Table 8. Causality Test

Direction of Causality	Null Hypothesis (H_0)	F-statistic	P-values	Decision
GDPGR→AAR	No Causality	1.37994	0.2483	Do not Reject H_0
AAR→GDPGR	No Causality	7.27563**	0.0108	Reject H_0
GDPGR→FRD	No Causality	1.26799	0.2680	Do not Reject H_0
FRD→GDPGR	No Causality	0.05941	0.8089	Do not Reject H_0
GDPGR→CO2	No Causality	1.82496	0.1856	Do not Reject H_0
CO2→GDPGR	No Causality	0.03079	0.8617	Do not Reject H_0

Source: Author's computation (2021).

The result of the granger causality test indicates that the null hypothesis can only be rejected in three causality relations. Specifically, the result shows that only annual average rainfall has a strong causality relationship with economic growth and hence its null hypothesis cannot be upheld. Though there is causality between these variables, the direction of causality only flows from this variable to economic growth. Given this outcome, it can be said that there is a unidirectional causality between annual average rainfall to economic growth.

The result from the causality test most adequately, lends credence to the validity of the regression earlier obtained from the ARDL regression exercise. It provides robust evidence linking the climate change and economic growth

The study found that annual average rainfall has a significant effect on economic growth in both short run and the long run.

Also, there is a high degree of positive and significant relationship between carbon emission, foreign direct investment, gross fixed capital formation and economic growth under investigation. The result also revealed that this relationship between climatic factors and economic growth is more noticeable in the long run.

In addition, an inverse relationship was found between forest depletion, population growth and economic growth in the long run.

Finally, there is unidirectional causality between annual average rainfall and private economic growth in Nigeria.

3.10. Comparison of Result with Previous Studies

The outcome of this study revealed that annual average rainfall, forest depletion and carbon emission proxy for climate change have significant effect on economic growth both in the short run and in the long run.

In the long run, the empirical results obtained from this study show some interesting empirical regularities and resemblance with previous studies. Specifically, the results here in some aspects support the results of previous studies on this topic, for example, forest depletion has negative impact on growth likewise population growth, while carbon emission, annual rainfall depicted a direct relationship with growth. This finding contradict the findings of Belford et al. (2020) whose results revealed negative impact on growth in Gambia. Recent empirical studies in this strand of the literature have noted that the climate change is an important determinant influencing economic growth in Nigeria. This result is in line with the findings of Alagidede, Adu and Frimpong, (2016) and Abidoye and

Odusola, (2015) whose findings revealed that climate change has a significant impact on economic growth. In this regard, the result derived from the ARDL estimation confirms this assertion.

4. CONCLUSION AND RECOMMENDATIONS

4.1. Conclusion

This study has examined the potential impacts of climate change on Nigerian economic growth using a time series data (1980-2017). In doing so, an econometric model has been constructed based on theoretical and empirical literature on the economics of climate change, then it has employed a growth model adapted from the Solow growth model. Accordingly, the result shows that an increase in forest depletion has a negative impact on economic growth measured by growth rate of gross domestic product. On the other hand, since Nigeria depends on rain-fed agriculture which comprises a huge share of GDP, a decline in rain fall reduces an economic growth. The reduction in economic growth will also result in increasing poverty. Thus, the control of climate change is not only important for economic growth problem, but also crucial for poverty alleviation. The result asserts that if climate change is not controlled, the economic growth will be reduced (an increase in forest depletion dangers a lot) considerably in the long run. However, Nigeria alone can do very little with regard to controlling climate change as its share of greenhouse gas emissions in comparison to developed countries is small. Although developing countries like Nigeria contribute least to causing climate change, they are most affected by this phenomenon. This is due to their dependency on agriculture and their inability to pay for the resources necessary to combat climate change via adopting the preventive measures (mitigation) and adaptation techniques.

4.2. Recommendations

As a result of the outcome of this study, the following policy recommendations were suggested:

Since Nigeria is experiencing the effects of climate change, it requires an active step in managing or controlling climate-related problems. In order to solve this negative externality, the mitigation (ex-ante) and adaptation (ex-post) strategies should be in place. Besides the direct effects such as an increase in average temperature or a short run dynamics in rainfall patterns, climate change also presents the necessity and opportunity to change to a new, sustainable develop-

ment model, Climate-Resilient Green Economy (CRGE) Strategy to protect the country from the adverse effects of climate change and to build a green economy. Furthermore, Nigeria should firmly continue with the bargaining and active participation in the climate change agreements at the global scale so as to be compensated for the risk of greenhouse gases emitted from industrialized countries which take historical responsibility for emission. In response to the severe impacts of climate change on economic growth some possible climate-related strategies or programs and policies should be implemented. Since climate change has already begun in our country, mitigation to reduce its damage should be applied primarily. Then, adaptation should be the second and best method to reduce the adverse impact of climate change since adjustment is an important tool for the long-run economic growth. In line with these programs, government should apply policies related to climate change with objectives to minimize the emissions of greenhouse gases by using alternative energy sources such as geothermal energy, hydrothermal energy and solar energy. Furthermore, building a strong green economy should be a part and parcel of all stakeholders and the general public. This building of green economy enables sinking carbon and promotes carbon market in the long-run.

REFERENCES

Abidoye, B. O., & Odusola, A. F. (2015). Climate change and economic growth in Africa: an econometric analysis. *Journal of African Economies*, *24*(2), 277-301.

Ahmed, M. (2020). *Introduction to Modern Climate Change*. Andrew E. Dessler: Cambridge University Press, 2011, 252 pp, ISBN-10: 0521173159. Book Review. *The Science of the Total Environment, 734,* 139397.

Alagidede, P., Adu, G. & Frimpong, P. B. (2016). The effect of climate change on economic growth: evidence from Sub-Saharan Africa. *Environmental Economics and Policy Studies, 18*(3), 417-436.

Belford, C. et al. (2020). The impact of climate change on economic growth based on time series evidence. *Int. J. Hum. Capital Urban Manage, 5*(4), 305-318.

Castle, J. L., Doornik, J. A. & Hendry, D. F. (2020). Modelling non-stationary 'Big Data'. *International Journal of Forecasting*. https://doi.org/10.1016/j.ijforecast.2020.08.002

Dhungel, K. R. (2012). The Link between Remittance and Economic Growth: An ARDL Bound Testing Approach. *NRB Economic Review*, *30*(2).

Fadairo, O. et al. (2020). Climate Change, Rural Livelihoods and Ecosystem Nexus: Forest Communities in Agro-ecological zones of Nigeria. *African Handbook of Climate Change Adaptation*, 1-24.

Guntukula, R., & Goyari, P. (2020). The impact of climate change on maize yields and its variability in Telangana, India: A panel approach study. *Journal of Public Affairs, 20*(3), e2088.

Ikhuoso, O. A. et al. (2020). Climate change and Agriculture: The competition for limited resources amidst crop farmers-livestock herding conflict in Nigeria-A review. *Journal of Cleaner Production,* 123104. https://doi.org/10.1016/j.jclepro.2020.123104

Khan, S. A. R., Yu, Z., Sharif, A., & Golpîra, H. (2020). Determinants of economic growth and environmental sustainability in South Asian Association for Regional Cooperation: evidence from panel ARDL. *Environmental Science and Pollution Research*, *27*(36), 45675-45687.

Liu, H., Huang, B., & Yang, C. (2020). Assessing the coordination between economic growth and urban climate change in China from 2000 to 2015. *Science of the Total Environment, 732*, 139283. https://doi.org/10.1016/j.scitotenv.2020.139283

Pata, U. K., & Aydin, M. (2020). Testing the EKC hypothesis for the top six hydropower energy-consuming countries: evidence from Fourier Bootstrap ARDL procedure. *Journal of Cleaner Production, 264*, 121699. https://doi.org/10.1016/j.jclepro.2020.121699

Stiglitz, J. E. (2019). Addressing climate change through price and non-price interventions. *European Economic Review*, *119*, 594-612.

КЛИМАТСКЕ ПРОМЈЕНЕ И ЕКОНОМИЈА НИГЕРИЈЕ: КВАНТИТАТИВНИ ПРИСТУП

[1] Адејумо Мусибау Ојо, Универзитет у Лагосу, Економски факултет, Нигерија

САЖЕТАК

Ова студија је испитала потенцијалне утицаје климатских промјена на нигеријски економски раст користећи податке из временских серија (1980-2017). Стога је изграђен економетријски модел, заснован на теоријским и емпиријским радовима економије климатских промјена, а затим је примијењен модел прилагођен Соловљевом моделу раста. Истраживање је објелоданило да просјечне годишње кише имају значајан ефекат на економски раст у кратком и у дугорочном периоду. Такође, постоји висок степен позитивне и значајне везе између емисије угљеника, страних директних инвестиција, формирања бруто трајног капитала и економског раста. Резултат је такође открио да је овај однос између климатских фактора и економског раста уочљивији у дуго року. Поред тога, пронађена је обрнута веза између исцрпљености шума, раста становништва и економског раста на дужи рок. Коначно, постоји једносмјерна узрочност између просјечних годишњих

киша и економског раста у Нигерији. Стога се препоручује да заинтересоване стране и шира јавност треба да граде зелену економију која омогућава смањење нивоа угљен-диоксида и дугорочно промовише тржиште угљеника.

Кључне ријечи: *економски раст, глобално загријавање, угљен-диоксид, климатске промјене.*

CONFLICT OF STRATEGIES – BOSNIA AND HERZEGOVINA DEVELOPMENT STRATEGY AND SUPPORT STRATEGIES OF INTERNATIONAL FINANCIAL INSTITUTIONS

1 Miroljub Krunić, Ministry of Finance and Treasury of BiH, Sarajevo, Bosnia and Herzegovina
*Corresponding author E-mail: mkrunic@mft.gov.ba
1 ORCID ID: 0000-0003-3801-8348

ARTICLE INFO

Review scientific paper
Received: 14.02.2021
Revised: 04.04.2021
Accepted: 26.04.2021

doi 10.7251/ACE2134187K
UDC
339.7+336.71]:339.727.22
(497.6)

Keywords: *development management, public debt, business environment, fiscal sustainability, competitive ability, economic development strategy, balance of payments deficit, currency board*

JEL Classification: C54, H05, F02, F34, G18, B22

ABSTRACT

Over the past twenty five years, Bosnia and Herzegovina has been experiencing, with more or less oscillations, low and stagnant economic growth. Planning and economic policy documents shaped the vision of rapid transition and successful economic growth, which was supposed to enable the sustainability of the economic system and its elements. The strategic commitment to integrate into the European Union system has not changed. It was confirmed by signing the Stabilization and Association Agreement in 2008. International financial institutions have even provided financial support to the economic programs in BiH and its entities to an extent greater than their capacity to use, but below the economic needs of the country as a whole.

In these circumstances, the issue of a possible conflict between the economic development goals of Bosnia and Herzegovina and the objectives of financial support provided by the international community has been raised. Circumstances such as a long period of time, modest economic performance, lost opportunities and dangerous negative trends indicate the need to reconcile the conflicting strategies and interests of two parties - Bosnia and Herzegovina and the international community.

1. INTRODUCTION

After the end of the civil war in Bosnia and Herzegovina, intensive cooperation with international financial institutions began. It was necessary to rebuild the country as soon as possible, repair the consequences of the war and open the processes of development and systematic transition in the direction of an efficient market economy. Bosnia and Herzegovina received help from representa-

tive and long-known financial institutions around the world. Of course, it was done on the basis of invitations and agreements with domestic entity and state authorities. The transition process was supposed to be fast and, of course, efficient. But, contrary to wishes and expectations of everyone and to the general surprise, that process was difficult, painful and without the necessary liveliness and dynamics. The long-term maintenance of negative economic trends has not only created the characteristic and long the so-called transitional tail in Bosnia and Herzegovina and accumulated more problems on that transitional path, but also made the overall recovery difficult and extremely complex. The appearance and long retention of negative economic trends in turn open the question of harmony and synchrony of strategic goals of the country's development, i.e. Bosnia and Herzegovina on the one hand and the international community on the other.

This paper deals with the analysis of the connection, interdependence of the mentioned two strategies and the degree of their inconsistency, i.e. conflict. The current economic situation and the fact that the international community, which came to rescue, is still looking for an effective mechanism of financial cooperation, which makes this topic both current and controversial at the same time. The main goal of the paper is to present the essential elements that create a discrepancy between the results of implemented strategies and the financial potential available for their realization and to draw the attention of decision makers in this domain, as well as the professional public, to the problem of conflict of development goals between stakeholders.

The paper starts from the hypothetical research thesis that there is a conflict between the goals of economic development of Bosnia and Herzegovina and the goals of support of the international community and international financial institutions. The research focuses on the content of the objectives from the strategic documents, economic results and support programs during the long transition period. The second part "Previous research" emphasizes the importance of the pace and sustainability of growth, and gives positive examples of research that highlighted the role of governments in individual communities in achieving sustainable growth and the use of economic change in the environment, as good economic opportunities. The given examples, visible in a number of other countries speak of the primacy of the influence of knowledge and innovation in shaping development and the need for planned design development flows. The third part "Methods and data" presents an insight into the methods and data sources used. The fourth part "Results" provides a framework for the content of strategies, and points to their interconnectedness and interdependence of program components and projects with structural economic change, keeping the focus on targets. Furthermore, the key areas of conflict of strategies and the consequences of their manifestation are presented. The final part "Discussion with a conclu-

sion" presents the conclusions reached in this research, which, at the same time, prove, i.e. confirm the previously set scientific hypothesis in the paper.

2. PREVIOUS RESEARCH AND WORK METHODS

2.1. Previous research

Economic development contributes to the development of society and its social status. In the period of globalization and very strong competition, all countries are focused on maintaining continuous growth and sustainable economic development. This issue is particularly important for transition and developing countries that want to alleviate economic disparities compared to countries with developed economies. The question of an economic development model that can be adequate in that area is openly stated in the professional and scientific public (Burda, 2016). The advantage of developed countries in terms of capital levels, technological achievements and human capital performance is such that it multiplies and constantly increases economic disparities. Modern theories and models of economic development point to the need of taking into account the specific economic conditions of an individual country and applying a suitable model of development. The access to economic development for some countries is becoming more complex than ever. The specificity of such an approach makes the process of integration of countries more demanding in the context of access to a larger market. Experience suggests the need to maintain an open market economy, high savings and investment rates, capable and efficient governments, and macroeconomic stability as a starting point in building a potential model. Thus, Professor Sakda Siriphattrasophon in his article entitled "The ASEAN Economic Community: How SMEs Could Exploit Local Value to Compete?" speaks about the advantages and possibilities to use the system of local values in circumstances of growing competitiveness for companies during establishment of Asian Economic Community and continues: "This will strengthen the competitiveness of the region and create new business opportunities for members. Consumers will have a wider choice of goods and services and will benefit from easing immigration regulations." He further concludes that "SMEs will also face new challenges due to free trade and investment within the Association of Southeast Asian Nations (ASEAN) as this will create a highly competitive situation". The paper especially emphasizes the importance of the role of governments that should provide adequate support to companies, which must be placed in a dynamic mechanism in order to truly support the growth of companies. The paper lists the areas of exploitation of local values in building competitiveness. (Sakda, 2018). In addition, innovation is becoming a factor of competitiveness and implies a significant role of the government in the field of education, re-

search and development functions, and the design of individual development programs based on previous analysis of the context of needs and circumstances. In his paper "The opportunity matrices for chain innovative transformation of economy: the cite concept" Taras and Obermok point to the possibility of using technological knowledge from complex natural systems in shaping economic processes in the inter-sectoral matrix of domestic gross product (Taras, 2017). The authors cite an example from Singapore (p. 25): "Despite the fact that there are no natural resources in Singapore, the country is a world leader in the production of platforms for offshore oil exploitation. The government should try to determine which industries can be representative in the future and invest heavily in them." On the page 21, they further state: "With the progressive growth of the global economy and the accompanying economic crises, there is an urgent need to forecast and model the process of forming of strategies for sustainable development, balanced government regulations and economic liberalism." A group of authors from the University of Sarajevo (Domljan, 2017) emphasize as a precondition for BiH to find itself on the path to become a highly developed country "... to activate the knowledge production chain..." (p.161). Timely recognition of comparative advantages, perspective chains of business and formed purposeful development strategy and its application can bring a significant competitive advantage.

2.2. Working methods and data

For the needs of the subject research, data on the content of strategic planning documents were previously collected and their comparison was performed. The arrangements of the International Monetary Fund and the strategy for BiH of the World Bank and the European Bank for Reconstruction and Development are primarily covered. The selection of institutions was made according to the importance in the portfolio of projects financed in Bosnia and Herzegovina. For the area of structural reforms, the reports of the European Commission were reviewed as relevant reports and documentation, especially due to the retained commitment to membership in the European Union. At the same time, the results of the implementation of individual programs were inspected and economic trends were analyzed, particularly the growth trend of domestic gross product and the trend of negative foreign trade balance based on statistical reports of the Central Bank of BiH. United Nations population statistics were used to analyze the trend of the country's temporal loss of labor resources.

When it comes to scientific methods used in this paper, we emphasize that the methods of comparison, analysis, synthesis, induction and deduction and the method of statistical analysis, tabular and other methods of text illustration, historical method, method of generalization and specialization, etc. were used.

3. RESULTS

3.1. Interdependence of Bosnia and Herzegovina Strategy and Support Strategies

The BiH Economic Reform Program for the period 2019-2021 from January 2019 was submitted to the European Commission as a part of the regular reporting procedure (BHRP, 2019). The key reform priorities during the three-year period are: identification of key barriers to competitiveness and inclusive growth with a focus on eighteen measures, and special priorities related to nine areas. In the area of reforms in the energy and transport sectors, it is envisaged to improve the legal framework regarding the establishment of the energy community and sustainable financing of railway infrastructure. In the domain of sectoral development, a special emphasis is placed on the intensification of agricultural production. In the area of business environment, the intention was expressed to improve the infrastructure system in accordance with the European Union model, reform of the health sector and the register of incentives for the economy, reduce the share of current spending in public administration and intensify the development of entrepreneurial infrastructure. In the field of research, development, innovation and digital economy, it is planned to improve the regulatory framework in accordance with European Union standards, improve the communications and information society sector, reform the research sector in BiH and establish a more efficient management system in the field of scientific research in BiH, and establish more efficient system of management in the area of scientific research of potentials for innovations in Republika Srpska. In the area of education and skills, it is planned to improve cooperation between education and the labor market. For the field of employment and the labor market, a commitment was expressed to strengthen the efficiency of the labor market. In terms of social inclusion and poverty reduction, the establishment of an efficient system of health expenditures and the improvement of the social protection system are envisaged. The entire program of economic reforms in BiH is designed in such a way that it unites the programs of the entities without the necessary logic and economy of the whole.

The evaluation of the BiH economic program for the period 2019-2021 by the European Commission is given in a document dated April 11, 2019 and contains a list of shortcomings of government policy that do not allow it to raise economic growth potential through strong public and private investments (BHRP, 2019). In particular, it was emphasized that the risk of things improving is stronger and higher than expected of the proposed program due to continued delays in the implementation of reform measures, and the growth policy associated with

reforms related to the accession process. The European Commission recognizes only six reform measures in the proposed program that may be relevant to the country as a whole and recognizes that 15-20 measures concerning barriers to competitiveness have been underestimated. Regarding the improvement of agricultural production and the establishment of an efficient food safety and quality system, it is assessed that this measure is too ambitious due to the lack of agreement on competencies regarding the paying agency at the level of Bosnia and Herzegovina and insufficient cooperation between the two entities. In doing so, it insists on better institutional arrangements for the country as a whole, in order to avoid overlapping competencies and to strengthen control and coordination chains. The promotion of "start-up" jobs was assessed as relevant with a critical review that there is an excessive insistence on protectionism in this sector due to the contradiction of competitiveness. Insufficient information regarding timelines and budgeting was noted. The measure of improving the quality of the infrastructure system in accordance with the model of the European Union was assessed as relevant because, if implemented, it would contribute to the creation of a single economic space and facilitate trade, and in the long run increase competitiveness and potential for economic growth. The assessment focuses on the previously observed lack of real progress and readiness to achieve concrete results. Also, budget allocations and sources of funding are not induced. In the part on the measure of improving the communication and information society in accordance with the standards of the European Union, there is an assessment of the relevance for economic growth and increasing productivity. However, the very allegation that there is a lack of progress in the implementation of this measure, unclear budget preconditions and the absence of key performance indicators leaves a trace of optimism of the measure. In the area of research and innovation reform, the evaluation points to its importance for the country as a whole, but also to the lack of clear implementation plans, budget commitments and performance indicators, suggesting a state-level framework for the digital economy. With regard to measures for improvement of the efficiency of the labor market, the relevance of the goal of labor legislation reform was assessed. The lack of a plan of concrete steps, the lack of indicators or their inadequacy, and delays in the past indicate a possible risk. Also, the costs of implementation of this measure, according to the assessment, are not listed with the highlighted fact that the current situation in the two entities indicates insufficiently developed activities that create the necessary preconditions. The measure of improving the social protection system was assessed as relevant with the necessary focus on better targeting of social benefits, better coverage of the poorest through mapping and creating a register of social benefit beneficiaries. In addition, the finding is that this measure is ambitious and implies the interdependence of a number of other

activities. Summarizing the findings, the main problems that still accompany us are pointed out: fiscal policy does not pay enough attention to the quality of public spending, the quality of short- and medium-term fiscal planning is accompanied by weaknesses in statistical support and short-term policies, Bosnia and Herzegovina's competitiveness remains stigmatized by over-administration and fragmented economic space, and large, inefficient and non-transparent state-owned enterprises remain a ballast in payments. Furthermore, it is assessed that Bosnia and Herzegovina has a problem with low female labor force participation and high unemployment, and that previous implementation of relevant policies was limited, linking it to the lack of progress in fiscal planning and analysis focused on the medium term, and lack of reliable statistics. There was also a comment on the lack of review of enrollment policy in the secondary and higher education, as well as insufficient coordination and lack of progress between employment measures and social benefit schemes. (Krunić, 2019)

With the latest program of economic reforms for the period 2020-2022, Republika Srpska has opted for the implementation of structural reforms in these eight areas: markets, energy and transport; agriculture industry and services; business environment and the reduction of the informal economy; research, development, innovation and the digital economy; trade-related reforms; education and skills; employment and the labor market; and social protection and inclusion (Ministry of Finance of the Government of Republika Srpska, 2020).

Such a commitment was also stated in the program for the period 2019-2021. The previous program 2018-2020 emphasized nine reforms: public financial management; energy and transport market reform; sectoral development - agriculture, forestry, water management - reconstruction of state-owned companies - restructuring of banks and introduction of stricter prudential requirements for banks - introduction of mandatory restructuring of closed-end investment funds; business environment and reduction of the informal economy; research development and innovation; trade-related reforms; education and skills; employment and the labor market; social inclusion and poverty reduction. The 2017-2019 program focuses on the public financial management, the energy, transport and communications market, sectoral development, the business environment and the reduction of the informal economy, research and innovation, foreign trade and investment facilitation, education and skills, employment and the labor market, social inclusion and poverty reduction (a total of nine areas). The Program 2016-2018 envisages 10 reform priorities. In the sector for public financial management, the reform of the health care system, the suppression of the gray economy, the increase of fiscal responsibility, and the reduction of the tax burden on labor were envisaged including the infrastructure sector with the restructuring

of the Republika Srpska Railways, the industry sector with reindustrialization in all areas of the processing industry, and the services sector where the legal framework of the banking sector should be modernized and the preconditions for bank restructuring should be created, the business environment sector with the elimination of parafiscal levies as a barrier to business operations and the removal of barriers to investment. In the employment sector, new labor legislation and employment support in the real sector are envisaged (Ministry of Finance of the Government of Republika Srpska, 2020). A comparative overview of the accents of economic reforms in BiH is given in Figure 1.

Based on individual country strategies, key international institutions have proposed a number of individual arrangements and financing agreements that support the implementation of promised reforms. Their schedule in relation to the most frequently present requests is given in Table 1. It is noticeable that most frequently repeated requests for reforms come from the International Monetary Fund. Overall, these requirements have been partially implemented, often in a way that the tranches conditioned by structural reforms were abandoned. The World Bank and the European Bank for Reconstruction and Development have sporadically monitored requests for reforms from the Monetary Fund arrangement. Special coordination is noticeable in the period that started in 2016. These medium-term programs have been partially implemented, with the absence of promised reforms. It is evident that there have been frequent repetitions of requests for the same reforms that were persistently delayed. Thus, the request for privatization was current during 2002, but was renewed in 2012 and 2016. The same can be concluded when it comes to the requirement to improve the business environment or the requirement to maintain a pegged currency.

Table 1. Overview of International Financial Institutions' Country Arrangements and Support Strategies on Key Reform Programs in Bosnia and Herzegovina by years

Descript.	1998	2002	2004	2008	2009	2012	2014	2016	2017	2020
IMF	4,3,2	9,8,7,4, 3,2,1			9,8,4,3,2	8,6,5,4, 3,2,1		8,5,4,3,2,1		6
WBANK			4,2	3,2		6,3,2		6,4,3,2,1		
EBRD							6,1	2	9,6,2,1	

Source: Author's calculation on the basis of the Support arrangements for these MFIs;

Legend: 1=Private sector development, employment incentives, privatization; 2=Improving the business environment, stimulating investment, improving the labor market; 3=Sustainability of public finances; 4=Sustainability of the financial system; 5=National policy, cooperation and coordination, Strengthening the economic space; 6=Crisis resilience, resource protection, toughness of the economy, transport and energy infrastructure; 7=Rule of law, 8=Maintenance of pegged currency; 9=Privatization

RS Economic Reform Program 2016-2018

Public finances and health care reform. Railway restructuring. Reindustrialization of the manufacturing industry. Legal framework of banking. Elimination of parafiscal levies, adoption and implementation of bankruptcy law. New labor legislation.

RS Economic Reform Program 2018-2020

Public financial management with health sector reform. Energy market reform and railway restructuring. Improvement of agriculture; restructuring of public enterprises, restructuring of banks and funds. Reducing the informal economy and supporting competitiveness. Establishing an efficient management system for scientific research and innovation potential. Branding of domestic production. Improving the connection between education and the labor market. Increasing labor market efficiency and reforming employment services. Social inclusion, poverty reduction and equal opportunities.

RS Economic Reform Program 2020-2022

Improving the regulatory framework in the electricity sector and reorganizing and restructuring the electricity and railways. Improving the competitiveness of agriculture, forestry and water management and liberalization of car liability insurance prices. Business environment and reduction of informal economy with reform of health system, inspectorate and reduction of current consumption expenditures. Establishment of an efficient management system for scientific research and investment potential and better e-government. Regulation of the area of real estate brokerage. Improving the connection between education and the labor market and strengthening the quality of education. Increasing the efficiency of the labor market and continuing the reforms of the Employment Service. Improving the social protection system.

B&H Economic Reform Program 2019-2021

Reform of the legal framework for the energy market and establishment of a sustainable railway infrastructure financing system. Improving agricultural production. Strengthening the quality of infrastructure in BiH in accordance with the EU model. Health system reform and reduction of running costs in public administration. Reform of scientific research in BiH and establishment of a more efficient system for managing scientific and innovation potential. Improving cooperation between education and the labor market. Increasing the efficiency of the labor market. An efficient health care system. Increasing social protection.

Relevant reforms of B&H from the EC 2019-2021

- Improvement of agricultural production and establishment of an efficient food safety and quality system.
- Improving the quality of the Infrastructure System according to the EU model.
- Improvement of communication and information society in accordance with EU standards.
- Reform in the field of research and development.
- Improving the efficiency of the labor market.
- Improvement of the social protection system.

Figure 1. Accents of economic reforms in BH 2019-2021 according to the EC report with ref. to RS programs. Source: Descriptions taken from the official documents and adapted by the author

The World Bank has proposed cooperation in the field of three main goals: unlocking the potential of the private sector for faster growth and creating greater volume and better jobs, investing in human capital with labor market regulation and environmental management in the function of sustainable growth with channeling socio-economic impact, which represents an extended approach from the previous period (WB, 2016). From the document, one can see the possibility for Bosnia and Herzegovina to leave the poverty zone and achieve economic prosperity through one to two generations, but with the condition of the transition from import-oriented economy to export economy and to release the potential of the private sector. According to the same view, this means reducing the public sector and raising the quality of services it provides, solving the situation and problems of state-owned enterprises, solving the investment climate and business barriers, maintaining a favorable macro-financial situation, building resilience to natural disasters and good resource management, and other accompanying conditions.

The European Bank for Reconstruction and Development in its strategy for the period 2017-2022 proposes three basic goals: First, capacity building and improvement of the private sector while promoting the commercialization of public utilities, and privatization of state-owned enterprises in order to strengthen competitiveness. Second, the support for the development of key transport and energy cross-border lines in order to strengthen integration within the region and strengthen the resilience of the country's economy. Third, support for the construction of energy efficiency and renewable energy sources with the support of municipalities to improve the quality of services in order to promote an environmentally sustainable economy (EBRD, 2017).

In listing the challenges for implementation, the country's weak regulatory framework for foreign direct investment and deterrent political risk, the need for support through the reform agenda, the International Monetary Fund's incentive arrangements and the prospect of EU membership were highlighted. Furthermore, low resilience to external shocks, delays in the reform of the road sector due to the suspension of "three P" projects (public, private and partnership projects), the presence of liquidity in the banking sector with the risk of high arrears, weak corporate sector and governance in underdeveloped, delayed privatization process in the Federation of BiH. However, the primary challenges remain: unfavorable business climate, poorly developed rule of law and insufficient readiness for reform.

The International Monetary Fund maintained its presence in Bosnia and Herzegovina during the previous period through a number of individual arrangements,

the last of which was approved in April 2020 in the amount of 361 million US dollars for emergency support in connection with the "COVID-19" pandemic in circumstances of open EFF arrangement. Such needs, according to the signed document, include increased costs related to health care, social benefits associated with rising unemployment, and assistance to companies in order to maintain employment. All this goes along with the obligation to maintain the system of pegged currency and raise the resilience of the banking system, the adoption of the law on deposit insurance and the extension of cooperation with other financial institutions in terms of securing the necessary financial resources. From the previous arrangement, there are still obligations to raise the growth of the private sector and employment, reforms that enable the improvement of the business climate and investment climate, improvement of the quality of public spending and reduction of public debt, maintenance of financial stability and other reforms in the financial sector. Also, the construction of a single economic space and the improvement of coordination and cooperation within Bosnia and Herzegovina are further emphasized and actualized.

3.2. Key conflicts

Understanding the mission. The multi-year period of drafting the reform program in cooperation with international financial institutions and the unsatisfactory results of their implementation raise the question of the essential reasons and possible areas of conflict. In this regard, several key zones of inconsistency (conflict) can be identified. First, different understanding of the mission of the economic organization of Bosnia and Herzegovina as a whole and its entities individually. The constitutional content points to the need to improve the general welfare and economic growth by protecting private property and improving the market economy, and to ensure human rights and freedoms of the highest level of internationally recognized rights, as well as fundamental freedoms. The existing programs on the BiH side reflect the declarative commitment to the mission concept set in this way. The implementation of the program in a way of permanent delay indicates a possible approach in understanding the mission of the economic organization as the one that should work for the needs of a particular interest group of society and not for the society as a whole. Second, a different approach to quantifying goals and conceiving the indicators of achieved results contributed to the maintenance of the conflict. In setting the quantitative elements of the goals of the country's strategies, international financial institutions respected the country's sovereign rights and its responsibilities for its own development. On that basis, the goals of individual strategies remained insufficiently related to the responsibility for their fulfillment, which led to an inadequate cor-

relation between the indicators of achieved results and the goals for individual programs. Third, the strategies operated with different and uncoordinated levels of transparency of the mandate and the vision of the organization. From the point of view of international financial institutions, the responsibility for meeting the strategic goals was primarily addressed to Bosnia and Herzegovina. There is no room left to consider the internal context of the mandate and responsibilities for fulfilling the assigned competencies. This was, as a rule, treated as an internal matter of the country and could not have been adequately discussed. Frequent internal contradictions, unwillingness to pursue a policy of clear mandates and the extension of responsibility for their fulfillment led to the neglect of essential obligations. Even in cases where there were undisputed competencies regarding the law, the adoption of bylaws was delayed for many years (Krunić, 2018). Fourth, inconsistencies in the area of value principles have led to a multiplication of contradictions in the content of documents. Thus, the principle of the rule of law was often emphasized on the one hand, and on the other it was insufficiently emphasized. The principle of market economy and private property had a similar fate, which can be said for the area of value principles related to human rights and freedoms. This area was specifically addressed by the Stabilization and Association Agreement that Bosnia and Herzegovina had signed with the European Commission (Stabilization and Association Agreement, 2015).

Last, fifth, inadequately formulated costs of individual programs and their connection with the budget system, and inadequate treatment of the development planning function contributed to the lack of mutual harmonization of strategic programs. The programs did not maintain strong correlations with the budget in terms of co-financing and supporting the self-sustainability of projects and system units. Development planning was neglected, so some programs "lost" the effects expected from them, the results often faded, and the transparency of their implementation remained low and marginalized. An abbreviated scheme of the conflict relationship is given in Table 2.

Table 2. Key areas of strategy conflict

Areas of conflict	External support strategies	BiH strategy
Understanding the mission	Mission as an effective transition	Mission as a delayed and slowed transition
Objectives and results	Open access to quantification	Quantification neglected
Internal contradictions	Weakened by internal regulatory mechanisms	Contradictions expressed, regulatory mechanisms weaken
Consistency of values	Value principles supported	Values declaratively supported
Cost design	There is an interest in co-financing	Interest in co-financing decreased

Source: Comparison by the author

3.3. Consequences of adequately unresolved conflict

Prolonged implementation of reform programs and the absence of positive results. Current conflicts have existed for a long time and are manifested in the constant delay in the implementation of initiated reform programs. The visibility of delays in the implementation of reforms over time took on clearer contours and became pronounced only after 2016 by the failure to implement the obligations under the Reform Letter and the Stabilization and Association Agreement. The European Commission's critical review of the proposed economic reform programs did not significantly change the attitude of the authorities in Bosnia and Herzegovina, so the rhetoric of declarative readiness for reforms continued, ignoring the obligation to implement them in the expected time. At the same time, unfavorable preconditions for improving the competitiveness of economic entities in Bosnia and Herzegovina, sustained growth and substantially unchanged foreign trade imbalance strengthened.

Inertness of the administrative system, delay in acquiring the conditions for the effectiveness of international financial agreements and their prolonged implementation. In the circumstances of the lack of real readiness for the accelerated implementation of purposeful economic reforms, the public sector retained the outlines of inertia and the economic system lost its desirable resilience. Bosnia and Herzegovina and its entities had extended administration in the previous period in gaining the effectiveness of international financial agreements. These were not only agreements that were supposed to encourage directly economic reforms, but also agreements that were oriented towards various investment projects. This was due to the pronounced multiplication of holders of obligations from such international agreements and a number of signatories from the side of Bosnia and Herzegovina. The relevant time period for gaining the effectiveness of financial contracts prescribed by the general conditions of international financial institutions is mainly related to a period of 60 days. This deadline is used as a reference period for calculating the cost of maintaining a financial source. Bosnia and Herzegovina achieves contract effectiveness well above this desirable time frame and pays high costs for maintaining financial resources, whether it is an extended efficiency or a slow implementation. Thus, during 2019, BAM 7.28 million were paid for this purpose (BiH, 2020). It is noticeable that this amount is above double compared to 2015, when it amounted to BAM 3.39 million. During 2010, BAM 3.88 million were paid for these purposes. This proves that persistence in postponing reforms was followed by the increased costs of maintaining financial resources and delayed implementation.

Slowed evolution in the domain of declaratively adopted values. The previous declarative commitment to a market economy, the rule of law, the develop-

ment of democracy, and the protection of private property were not adequately and timely implemented and it has remained an area pointed out by the international community on several occasions. Thus, the European Commission, with its Opinion on the Application for Bosnia and Herzegovina's membership in the European Union in May 2019, gave 14 recommendations which show that in terms of key values, not much has been advanced since the beginning (European Commission, 2019). Areas of democracy, the rule of law, the application of fundamental rights and the public administration reform remain key priorities today.

Slow economic growth. The demand for building a functioning market economy remained marginalized, and the achieved economic growth was slow and insufficient. The development of the growth rate of the gross domestic product during the five-year periods, which is shown in Table 3, indicates a slow and stagnant trend. Such economic growth cannot absorb the high unemployment rate and generate catching up with European Union countries in terms of living standards. On the contrary, the manifested growth trend can only strengthen the constant, continued and deeper lag in development and produce new economic problems, which, in addition to the existing ones, can lead to the complication and collapse of the economic system. The negative balance in the world trade is maintained at the level of over four billion BAM and practically indicates the absence of economic growth and the retention of the raw material and import-oriented economy.

Table 3. Key indicators of economic changes in Bosnia and Herzegovina according to CBBH statistics

Indicators by years	2000	2005	2010	2015	2019
GDP in BiH - growth rate	4,4	4,2	0,8	3,1	2,8
Balance of trade in mil USD		-4,900.8	-4,865.7	-4,071.1	-4,576.6
Population in BiH in 000	3751	3765	3705	3429	3301

Source: Statistics of the Central Bank of BiH (Statistics, 2019) and UN statistics according to world population prospects for 2019

Loss of natural and labor resources. The loss of population in the period after 2005 indicates high risks of losing the best quality workforce. Such a situation will directly affect the labor market in Bosnia and Herzegovina as well as labor costs, which will further worsen the state of competitiveness of economic entities and consequently jeopardize the economic position of society as a whole. The absence of an active approach in establishing an efficient market mechanism in general, along with the fact that the rule of law principle has not been built, retains the risk of uncontrolled loss of natural resources, which may jeopardize the survival of future generations in this area.

4. DISCUSSIONS WITH CONCLUSION

The hypothetical thesis that there is a conflict of previously discussed strategies has been proven. Conflicts exist on several levels and show a connection with three basic economic trends. Clear understanding of conflict and its impact on the level of growth of domestic gross product, negative trade balance and labor resources enables understanding of the harmfulness of delaying economic reforms, and enables understanding of the need for a mechanism of purposeful adjustment and targeted management of society, along with necessary connections with the surrounding market. This also indicates the circumstances of missed opportunities (and missed benefits) for the sake of purchase of time, due to goals that remain completely questionable from the point of the population of two entities and Bosnia and Herzegovina as a whole. Maintaining the existing conflict does not allow for positive economic changes that would lead to the development of an export-oriented economy, a healthy growing economy and the preservation of natural and labor resources.

By summarizing all of the above, the following can be concluded:

1. The Development Strategy of Bosnia and Herzegovina and its entities is in conflict with the support strategies of international financial institutions. Development planning is not adequately established in Bosnia and Herzegovina and its entities and does not reflect a link with the objectives of supporting international institutions.

2. Conflict relationships are manifested in the direction of constant deterioration of the chances for intensive economic growth, preservation of natural and labor resources, and strong impact on the budget expenditures of the competent institutions. Prolonged time to achieve efficiency and implementation of investment projects and reform support projects raise the question of responsibility for negative consequences that can be proven and quantified.

3. Possibilities for removing the considered conflicts of strategies are primarily a matter of domestic decision-makers, but also of additional influence of international institutions. This remains primarily a matter for the country and its institutions because of its primary responsibility for its own development and the natural relationship of adapting a smaller market to the larger. At the same time, the passage of time is not a good factor and ally on the side of domestic institutions and entities of Bosnia and Herzegovina in relation to the undertaken obligations.

4. The consequences of the conflict in any case concern the relations between the generations. The future generations are left with reduced opportunities to correct the failures of the generation that established and maintained complex conflict

positions. The transfer of intergenerational responsibility to new generations carries moral consequences in addition to the economic ones.

5. Changes in the economic situation of domestic entities during the conflict of development interests are still related to the general and individual issue of responsibility. Establishing the rule of law can make such a connection relevant. Nevertheless, the level of democratic awareness of our society will determine the direction and pace of progress in this regard.

REFERENCES

Attenborough, D. (2020). *Život na našem planetu.* Zagreb, Hrvatska: Školska knjiga.

BHRP. (2019). *Reform program of Bosnia and Herzegovina*. Retrieved from: https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/bih_erp_2019-2021.pdf

Blewitt, J. (2012). *Understanding Sustainable Development.* London, UK: Earthscan.

Bower, U. (2017). *State-Owned Enterprises in Emerging Europe: The Good, the Bad, and the Ugly*. IMF Working Paper 17/221. Washington, DC, USA: International Monetary Fund.

Burda, M. & Viplos, C. (2016). *Makroekonomija.* Beograd, Srbija: Ekonomski fakultet.

Đerić, B. (2019). Vratiti ekonomiju na stazu moralne nauke. *Jahorina Business Forum 2019*. Dostupno na: http://jbf.ekofis.ues.rs.ba/

Domljan, V., Miraščić, G., Riđić, G. & Riđić O. (2017). Od defektne do efektne razvojne politike BiH. *Acta Economica 15(27*), 137-162.

Doing business report. (2020). *Doing Business 2020*. World Bank Report. Retrieved from: https://www.doingbusiness.org/en/reports/global-reports/doing-business-2020

EBRD reports. (2020). Retrieved from: http://www.ebrd.com

European Commission. (2019a). *Communication from the commission to the European parliament and the Council. Commission Opinion on Bosnia and Herzegovina's application for membership of the European Union.* European Commission, EU. Retrieved from: https://ec.europa.eu/neighbourhood-enlargement/sites/near/files/20190529-bosnia-and-herzegovina-opinion_en.pdf

European Commission (2019b). *Key findings of the Opinion on Bosnia and Herzegovina's EU membership application and analytical report*. Retrieved from: https://ec.europa.eu/commission/presscorner/detail/en/COUNTRY_19_2778

Housel, M. (2020). *Psihologija novca*. Beograd, Srbija: Publik praktikum.

Informacije o javnom dugu. (2020). *Javni dug BiH.* Dostupno na: http://www.mft.gov.ba/srg/indeks.php

Janeway, W. H. (2012). *Doing capitalism in the innovation economy*. Cambridge, UK: Cambridge U.P.

Krunić, M. (2018). Pravna regulativa javnog duga, njegova implementaciona rješenja i Evropske vrijednosti. *Godišnjak Pravnog fakulteta u Istočnom Sarajevu*, *I*/2018.

Krunić, M. (2019). Razvoj i ekonomska politika BiH u kontekstu moralne održivosti za ishode tranzicije. *Zbornik radova, Jahorina Business Forum 2019*. Dostupno na: http://jbf.ekofis.ues.rs.ba/index.php/archive.

Montek, S. A. et al. (2008). *Commission on Growth and Development. The Growth Report – Strategies for Sustained Growth and Inclusive Development*. Washington, D.C., USA: World Bank.

Ministarstvo finansija Vlade Republike Srpske. (2021). Program ekonomskih reformi RS. Dostupno na: https://www.vladars.net/sr-SP-Cyrl/Vlada/Ministarstva/mf/PPP/Pages/Program-ekonomskih-reformi-2016-2018-godina.aspx

Mehmet, O. S. (2012). An investigation of violence against teachers in Turkey. *Journal of Instructional Psychology*, *39*(1), 51-62.

Reform Agenda. (2015). *Reform Agenda for Bosnia and Herzegovina 2015-2018*. Retrieved from: https://europa.ba/wp-content/uploads/2015/09/Reform-Agenda-BiH.pdf

Reports of the World Bank. (2020). World Bank. Retrieved from: http://www.worldbank.org/

Rozenberg, J. & Fay, M. (2019). *Beyond the Gap: How Countries Can Afford the Infrastructure They Need While Protecting the Planet.* Washington, DC, USA: World Bank.

Sakada, S. (2018). The Asean economic community: How SMEs could exploit local value to compete? *ABAC Journal, 38*(1), 1-17.

Solow, R. M. (1978). *Resources and Economic Growth*. USA: The American Economist.

Svjetska banka. (2016). Srednjoročni program, 2016-2020. Dostupno na: http://documents.worldbank.org/curated/en/752481468194999174/Bosnia-and-Herzegovina-Country-partnership-framework-for-the-period-FY2016-20

Stabilization and association agreement. (2015). L 164/2. *Official Journal of the European Union*

Statistika Centralne banke BiH. (2020). Dostupno na: http://www.cbbh.ba/indeks.php

Stern, N. (2002). *A Strategy for Development*. Washington, DC, USA: the World Bank.

EBRD (2012). *Strategy for Bosnia and Herzegovina 2012-2015*. Retrieved from: http://www.ebrd.com/pages/countries/Bosnia and Herzegovina

Swinkels R., & Turk, C. (2003). *Strategic Planning for Poverty Reduction in Vietnam*. Washington, DC, USA: The World Bank.

Taras, V. & Obermok, V. (2020). The oportunity matrices for chain inovative transformation of economy: the cite concept. *ABAC Journal 40*(1), 20-32.

Thaler, R. (2020). *Nerazumno ponašanje*. Zagreb, Hrvatska: Školska knjiga.

Thirlwall, T. (2011). *Economics of development.* London, UK: *Palgrave, Mcmillan.*

Tirole, J. (2016). *Economie du bien commun*. Paris, France: Presses Universitaries de France.

Trias de Bes, F., & Kotler, P. (2016). *Inovacijom do pobjede*. Zagreb, Hrvatska: Školska knjiga.

Wheelen, L. T. & Hunger, J. D. (1998). *Strategic Management and Business Policy*. Boston, Massachusetts, USA: Addison – Wesley.

СУКОБ СТРАТЕГИЈА - РАЗВОЈНА СТРАТЕГИЈА БОСНЕ И ХЕРЦЕГОВИНЕ И СТРАТЕГИЈЕ ПОДРШКЕ МЕЂУНАРОДНИХ ФИНАНСИЈСКИХ ИНСТИТУЦИЈА

[1] Мирољуб Крунић, Министарство финансија и трезора Босне и Херцеговине, Сарајево, Босна и Херцеговина

САЖЕТАК

Током претходних 25 година Босна и Херцеговина је остваривала, уз мање или веће осцилације, низак и стагнирајући економски раст. Планско-развојним документима и документима економске политике обликована је визија брзе транзиције и успјешног привредног раста који је требало да омогући одрживост економског система и његових структура. Стратешка опредијељеност за интегрисање у систем Европске уније није мијењана и потврђена је потписивањем Споразума о стабилизацији и придруживању 2008. године. Међународне финансијске институције су чак омогућиле финансијску подршку економским програмима БиХ и њеним ентитетима у већем обиму од њихових апсорпционих капацитета, али испод економских потреба земље у цјелини.

У таквим околностима отворило се питање могућег конфликта циљева економског развоја Босне и Херцеговине и циљева финансијске подршке коју је пружала међународна заједница. Околности као што су проток дугог временског периода, скромни економски резултати, изгубљене прилике и опасни негативни трендови, упућују на потребу усклађивања конфликтних стратегија и интереса двије поменуте стране – Босне и Херцеговине и међународне заједнице.

Кључне ријечи: *управљање развојем, јавни дуг, пословни амбијент, фискална одрживост, конкурентска способност, стратегија економског развоја, дефицит платног биланса, валутни одбор.*

PROFITABILITY OF AUDIT COMPANIES IN THE REPUBLIC OF SERBIA: EMPIRICAL RESEARCH IN THE PERIOD 2010-2019

1 Biljana Jovković, University of Kragujevac, Faculty of Economics, Serbia
2 Nemanja Karapavlović, University of Kragujevac, Faculty of Economics*, Serbia
3 Aleksandra Radojević, University of Kragujevac, Faculty of Economics, Serbia
*Corresponding author E-mail: nkarapavlovic@kg.ac.rs
1 ORCID ID: 0000-0003-2433-0963
2 ORCID ID: 0000-0002-3421-7828
3 ORCID ID 0000-0001-8000-9248

ARTICLE INFO

Review Scientific Paper
Received: 29.03.2021
Revised: 21.05.2021.
Accepted: 22.05.2021.

doi 10.7251/ACE2134205J
UDC
338.488.2:338.486.3
(497.11)"2010/2019"

Keywords: *audit company, profitability, audit services, ROA, net income*

JEL Classification: M42

ABSTRACT

The subject of the research in the paper is profitability assessment of audit companies operating in the Republic of Serbia. The objective of the research is to provide the answer to professional and scientific public whether the profitability of audit companies is conditioned by the impact of the size of audit company, origin of its equity or the existing market participation? The research included the entire population of active audit companies in the Republic of Serbia in the period from 2010 to 2019. Data analysis was performed in the statistical program SPSS, and non-parameter tests Kruskal-Wallis H test and Mann-Whitney U test were used. The research will give the answer to the question whether the profitability of an audit company depends on the source of its equity, the size or market participation it has in provision of audit services. The results of the research have shown that there is an impact of the size of the company, the origin of its equity and market participation on the profitability of audit companies measured by net income and return on total assets.

1. INTRODUCTION

Financial statements should provide relevant and faithful information to the users on the basis of which they make decisions. Independent auditor presents his/her opinion on financial statements whose basic role is to decrease information asymmetry between company management that makes them and their potential investors. With the decrease in information risk of the presented financial statements the audit enables safer investment decision making. More rational use of capital implies better use of economically limited goods and creation of bigger national wealth.

The most important change in the area of normative regulation of audit profession in the Republic of Serbia (RS) happened in 1996, when the Law on Financial Statements Audit was adopted. According to the Law from 2013, there was a separation of the Accounting Law and Auditing Law in two legal acts. The last amendments were made to the Auditing Law in 2019, which defines that licensed authorized auditors perform independent audit of financial statements, as independent auditors or for an audit company. External audit can be performed by: audit companies that have at least one licensed authorized auditor fully employed – for the audit of medium-sized companies (for the audit of large companies at least 4 authorized licensed auditors); independent auditors as entrepreneurs that have valid license for audit performance and audit companies of the EU member states, third countries, as well as auditors of member states or third countries that obtained the valid license for audit performance issued by the supervisor in RS. Audit service is provided by 259 authorized auditors (Chamber of Authorized Auditors – CAA, 2021).

Audit services are provided by audit companies. The stability of operating these companies and the security of provided services quality is important for the functioning of capital market since financial statements audit is the condition for the quotation of issuers' securities in this market. Starting from the mentioned importance of audit in economy, the focus of this research is the success of business operation of audit companies after the global economy crisis that affected financial markets in 2008. The profitability of audit companies was analyzed by measuring net income (profit or loss) and return on total assets (ROA) in the period from 2010 to 2019. The paper objective is to find out whether there is a statistically significant difference between profitability of micro, small and medium-sized audit companies. Moreover, the attempt has been made to find out whether the size of market participation of a company and the origin of its equity affect the profitability of these companies. The findings served in the development of clear image of the success focus: smaller audit companies or the companies that belong to *Big four,* and the right perception of the importance of certain participants in audit services market.

In 2010, there were 42 audit companies operating in RS (Jovković & Ljubisavljević, 2015: 540), whose number increased for more than 73% in the next 10 years, so in 2019 it reached the number of 73 audit companies (CAA, 2021). Bearing in mind such a movement in the number of active audit companies, the question of how much profitability these companies have and how much they are attractive to start one's own business was imposed to the authors of the paper.

2. LITERATURE REVIEW

The aim of the audit is to increase the level of trust of potential users in financial statements (Ljubisavljević & Jovković, 2016, 184), where the quality of audit can be conceived from a very low to extreme quality (Francis, 2004: 345-368). It has been established that over the years there has been a strengthening of legal regulation within audit profession, which includes the increased demand for the implementation of quality control system of the work of auditors and audit companies (Kondić & Petrović, 2008: 123-153). Economic science, accounting, audit and finances are significantly included in forensic science in developed market economies, and without the contribution of these disciplines it is not possible to imagine contemporary accounting, audit or court practice (Serdar & Vranješ, 2013: 179 - 200).

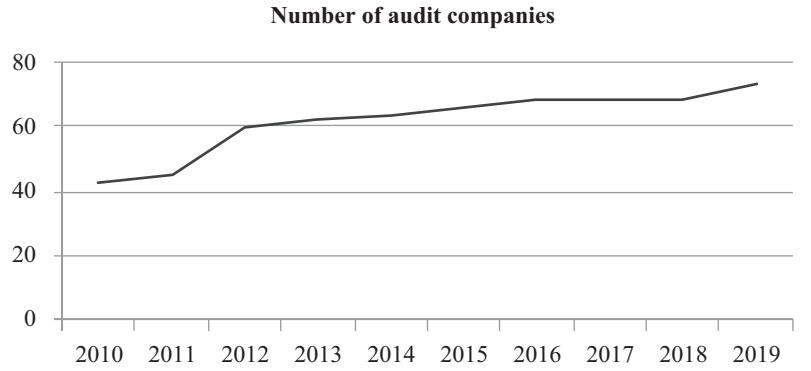
The importance of stratification of companies based on their size for obtaining the results is expressed in other research as well (Pobrić, 2019: 149-167; Vučenović, Milovanović & Grahovac, 2015: 49-68). Companies can be divided based on their size into: micro, small, medium-sized and large (The Accounting Law, The Official Gazette of RS, no. 73/2019, Article 6). Taking into account the criteria for grouping the companies according to their size, it has been shown that there are no large audit companies in the market of RS. Certainly, the companies that are smaller according to their size have significant contribution to the economy and its harmonious functioning. Small and medium-sized companies are important carriers of contemporary economy (Marinković & Senić, 2012: 13-22).

There are different ways of looking at the position and performance of audit companies. Some of the papers that researched audit companies and the success of business of stated companies in the RS took into account operating revenues, net income, number of employees, and number of authorized auditors (Jakšić, Mijić & Bojić, 2015: 549-559; Mijić, Jakšić & Vuković, 2014: 27-37). In addition to income and number of employees as separate categories, some authors observed the net income per employee (Milenković, 2017: 47-56; Mrdak, 2019: 19-29). Audit companies as professional institutions use human capital that represents an important input factor for acquiring competitive advantage (Chen, Yang & Yang, 2020: 1254-1270).

3. MATERIALS AND METHODS

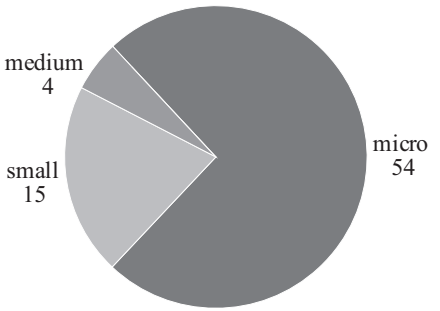
The research included the total number of 73 audit companies that existed in 2019 in RS. The characteristics of population within descriptive statistics have

been described by the following adjectives: the company size, headquarters, the age of the audit company, the type of founder (physical entity, legal entity or mixed), the number of founders and the number of auditors. Active number of audit companies during the period of the analysis was increasing constantly. The review of the number of audit companies that make research subject population was presented in the following graph.

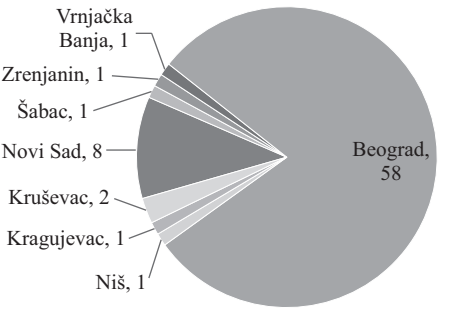


Graph 1. Active number of companies in RS in the period 2010-2019
Source: Authors' calculation on the basis of data, CAA, 2021

In 2010, there were 42 audit companies operating in RS (Jovković & Ljubisavljević, 2015: 540), whose number increased by more than 50% in the next 5 years, so in 2015 there were 66 companies in total (Ljubisavljević & Jovković, 2016: 363). In the second half of analyzed decade, the number of companies increased more slowly, so in 2019 it reached the number of 73 audit companies, which is an increase of 10,6% in comparison to the condition five years ago.



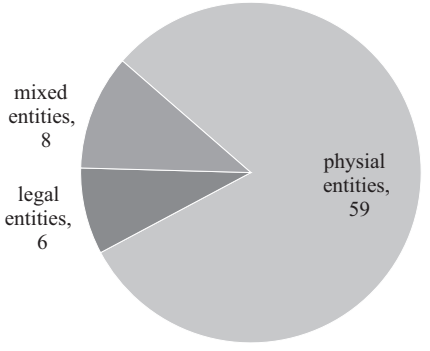
Graph 2. Audit companies according to their size



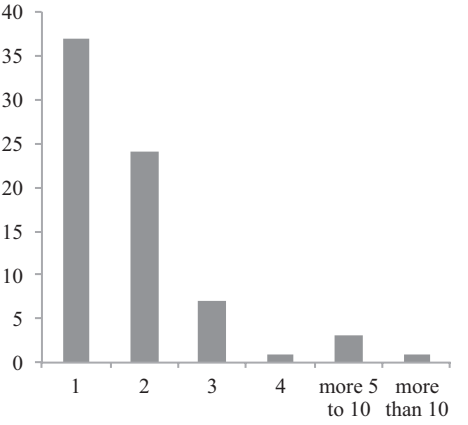
Graph 3. Audit companies according to their headquarters

Source: Authors' calculation on the basis of data, CAA, 2021

Audit companies can be micro, small, medium-sized and large, depending on the average number of employees, the amount of business incomes and the amount of total assets (The Accounting Law, Article 6). The audit company size and its reputation are some of the very important factors (Al Ani, Salim & Al Enzi, 2017: 1087-1095). The biggest number of audit companies is micro, according to their size, and with percentage share of these companies in the total number of audit companies being 73.97%. It is important to emphasize that the companies of medium size are actually the members of *"Big four"*. The most common headquarters of audit companies are in Belgrade (58), Novi Sad is the headquarters for 8 audit companies, Kruševac for two. One audit company has the headquarters in Šabac, Zrenjanin, Vrnjačka Banja, Niš and Kragujevac, respectively.



Graph 4. Audit companies acc. to founder type



Graph 5. Audit companies acc. to their age

Source: Authors' calculation on the basis of data, KOR, 2021

The biggest number of audit companies has been founded by physical entities, 59 of them, which is the most common type of founding, in 80.82% of cases. Legal entities have founded only 6 audit companies in RS, while mixed founders, comprised of both physical and legal entities have founded 8 audit companies. By observing active audit companies, the oldest among them are audit companies DELOITTE, FINEKS S.J. and BDO founded in 1991 and 1992. Audit companies that have existed in the market of RS up to 5 and 10 years make 24.66% of all audit companies, more precisely, 18 audit companies are in these groups. Even 15 companies have operated more than 20 years in the market of RS.

For the purpose of the analysis data on registered audit companies available in the official register of the Chamber of licensed auditors of the Republic of Serbia

have been collected (COA, 2021). The collected data were grouped by financial years and prepared for further treatment in the program Microsoft Excel. The formed database on the business of audit companies was imported into SPSS statistical program where further testing was started. Nonparametric tests were performed, as follows: Kruskal-Wallis H test and Mann-Whitney U test, depending on whether the population was divided into three or two strata for the purposes of testing a particular hypothesis. Considering that the mentioned tests compare the medians, a comparison of the medians of net income and the ROA by strata was performed. The following hypotheses were tested in the paper:

- H_1: The size of audit companies significantly impacts the profitability
  - $H_{1.1}$ measured by the amount of obtained net income
  - $H_{1.2}$ measured by ROA.
- H_2: The origin of the audit companies' equity significantly impacts the profitability
  - $H_{2.1}$ measured by the amount of obtained net income.
  - $H_{2.2}$ measured by ROA.
- H_3: Market participation of audit companies does not impact the profitability significantly
  - $H_{3.1}$ measured by the amount of obtained net income
  - $H_{3.2}$ measured by ROA.

4. RESULTS AND DISCUSSIONS

For the purpose of testing the first set hypothesis, which examines the existence of conditionality between the company size and profitability, a Kruskal-Wallis H test was performed. The company size was determined by using criteria for classification according to the Accounting Law (Accounting Law, Article 6). The first hypothesis is broken down into $H_{1.1}$, where the profitability is measured by the amount of obtained net income and $H_{1.2}$, where the profitability is measured by ROA, as the global profitability indicator (Bogićević, Domanović & Obradović, 2020: 9731).

$H_{1.1}$: The size of audit companies significantly impacts the profitability measured by the amount of net income.

The results of the performed test are shown in the Table 1.

Table 1. Results of Kruskal-Wallis H test – enterprise size and net income

Year	Chi-Square	df	Sig.	Median for micro enterprises	Median for small enterprises	Median for medium-sized enterprises
2010	16.580	2	0.000	1,518.00	13,313.50	15,731.50
2011	12.545	2	0.002	1,192.00	13,912.50	10,827.00
2012	13.410	2	0.001	849.00	9,962.00	8,316.00
2013	9.283	2	0.010	1,543.00	10,968.00	9,490.50
2014	16.644	2	0.000	559.00	12,587.00	23,457.00
2015	17.277	2	0.000	390.00	11,068.00	51,993.50
2016	26.021	2	0.000	247.50	5,049.00	34,107.50
2017	20.479	2	0.000	331.00	3,724.00	18,205.50
2018	23.506	2	0.000	470.50	6,526.00	9,553.00
2019	28.007	2	0.000	401.00	8,024.00	46,217.50

Source: Authors' calculation

The results of Kruskal-Wallis H test displayed in the Table 1 show that in each observed year there is a statistically significant difference in the amount of net income between audit companies of various sizes ($p < \alpha$). Median of medium companies is the highest in seven observed years, while the median of small companies is the highest in all years encompassed by the analysis. Median of micro companies is the lowest for all years encompassed by the analysis. Since Kruskal-Wallis H test only indicates that there is a possible statistically significant difference, but not between which groups, additional Mann-Whitney U tests were conducted between micro and small audit companies, micro and medium-sized audit companies, and small and medium-sized audit companies (Table 2), the results of which were interpreted after performing Bonferroni correction of alpha value ($\alpha = 0.05 / 3 = 0.017$) (Pallant, 2011: 235-236).

The results of Mann-Whitney U tests in the Table 2 show that between net income of micro and small audit companies there is a statistically significant difference in each observed year ($p < \alpha$), whereby that difference is of a medium intensity only in 2013, between medium and high intensity in six observed years and of a high intensity in three observed years (see the indicator of the size impact (r), according to Pallant, 2011: 231). In seven observed years there is a statistically significant difference between net income of micro and medium audit companies. That difference is of a medium intensity in 2010 and 2014, while from 2015 to 2019 it is between medium and high intensity. Between the net income of small and medium audit companies there is a statistically significant difference only in the last year of analysis, whereby that difference is of a high intensity.

Table 2. Results of Mann-Whitney U test – enterprise size and net income

Year	Mann-Whitney U	Z	Sig.	R
Micro and small				
2010	18.000	-3.720	0.000	0.448
2011	41.000	-3.317	0.001	0.399
2012	50.000	-3.244	0.001	0.391
2013	66.000	-2.725	0.006	0.328
2014	91.000	-3.558	0.000	0.428
2015	115.000	-3.496	0.000	0.421
2016	77.000	-4.404	0.000	0.530
2017	128.000	-3.690	0.000	0.444
2018	109.000	-4.051	0.000	0.488
2019	105.000	-4.364	0.000	0.525
Micro and medium-sized				
2010	5.000	-2.597	0.009	0.341
2011	19.000	-1.843	0.065	0.242
2012	13.000	-2.340	0.019	0.307
2013	20.000	-1.897	0.058	0.249
2014	15.000	-2.521	0.012	0.331
2015	13.000	-2.735	0.006	0.359
2016	5.000	-3.096	0.002	0.407
2017	7.000	-3.048	0.002	0.400
2018	4.000	-3.159	0.002	0.415
2019	0.000	-3.314	0.001	0.435
Small and medium-sized				
2010	23.000	-0.121	0.903	0.028
2011	22.000	-0.243	0.808	0.056
2012	20.000	-0.485	0.628	0.111
2013	22.000	-0.243	0.808	0.056
2014	19.000	-1.100	0.271	0.252
2015	21.000	-0.900	0.368	0.206
2016	15.000	-1.500	0.134	0.344
2017	17.000	-1.300	0.194	0.298
2018	20.000	-1.000	0.317	0.229
2019	3.000	-2.700	0.007	0.619

Source: Authors' calculation

– $H_{1.2}$: The size of audit companies significantly impacts the profitability measured by ROA.

The results of the performed test were shown in the Table 3.

Table 3. Results of Kruskal-Wallis H test – enterprise size and ROA

	Chi-Square	df	Sig.	Median for micro enterprises	Median for small enterprises	Median for medium-sized enterprises
2010	4.691	2	0.096	28.89%	22.75%	5.67%
2011	3.980	2	0.137	22.59%	17.99%	3.29%
2012	3.338	2	0.188	22.23%	22.46%	3.16%
2013	4.244	2	0.120	30.59%	14.80%	2.95%
2014	0.966	2	0.617	16.28%	15.77%	7.18%
2015	0.598	2	0.741	15.32%	11.38%	11.82%
2016	0.826	2	0.662	3.44%	10.17%	8.84%
2017	1.376	2	0.503	9.30%	9.24%	4.56%
2018	2.808	2	0.246	9.38%	8.73%	1.93%
2019	0.060	2	0.970	6.05%	7.54%	7.28%

Source: Authors' calculation

Kruskal-Wallis H test did not reveal a statistically significant difference between the ROA in audit companies of various sizes ($p > \alpha$ in each of the observed years). In seven observed years, median of ROA is the highest with micro audit companies, while in three observed years median of rate on total assets was the highest in small companies. Median of the ROA of medium-sized companies is the lowest in seven observed years, of micro companies in two, and of small companies in one year.

For the purpose of testing the second set hypothesis that examines the existence of conditionality between the origin of the audit companies' equity and profitability a Mann-Whitney U test was performed. The origin of one's equity was established according to the status of ownership available in the data of the Business Registers Agency of RS. All residents of RS are domestic entities while investors, legal and physical entities from foreign countries, are treated as foreign entities. The second hypothesis is broken into $H_{2.1}$ where the profitability is measured by the amount of realized net income and $H_{2.2}$ where the profitability is measured by ROA.

– $H_{2.1}$ The origin of audit companies' equity significantly impacts the profitability measured by obtained net income.

The results of Mann-Whitney U test given in the Table 4 show that only in period 2017-2019 there is a statistically significant difference between obtained net income of domestic and foreign audit companies ($p < \alpha$). However, the analysis of median shows that net income of foreign audit companies is higher than realized net income of domestic audit companies in all years of the analysis.

Table 4. Results of Mann-Whitney U test – enterprise origin and net income

	Mann-Whitney U	Z	Sig.	r	Median for domestic	Median for foreign
2010	64.000	-1.512	0.130	0.177	2,803.00	11,419.00
2011	80.000	-1.833	0.067	0.215	1,462.00	5,510.00
2012	109.000	-1.102	0.270	0.129	1,407.50	5,206.00
2013	117.000	-0.850	0.395	0.099	2,058.50	4,024.00
2014	245.000	-0.565	0.572	0.066	1,217.00	6,615.00
2015	323.000	-0.358	0.720	0.042	750.00	981.00
2016	286.000	-1.421	0.155	0.166	381.00	1,503.00
2017	266.000	-2.005	0.045	0.235	366.50	2,314.00
2018	201.000	-3.044	0.002	0.356	590.00	5,509.00
2019	255.500	-2.878	0.004	0.337	433.50	4,265.00

Source: Authors' calculation

– $H_{2.2}$ The origin of audit companies' equity significantly impacts the profitability measured by ROA.

The results of performed testing were shown in the Table 5.

Table 5. Results of Mann-Whitney U test – enterprise origin and ROA

	Mann-Whitney U	Z	Sig.	r	Median for domestic	Median for foreign
2010	58.000	-1.654	0.098	0.194	25.860%	6.735%
2011	111.000	-0.800	0.424	0.094	20.560%	7.920%
2012	89.000	-1.636	0.102	0.191	23.470%	4.780%
2013	84.000	-1.890	0.059	0.221	25.735%	4.120%
2014	211.000	-1.362	0.173	0.159	16.715%	8.730%
2015	233.500	-1.884	0.060	0.221	15.180%	5.935%
2016	351.500	-0.387	0.699	0.045	4.940%	4.260%
2017	337.000	-0.943	0.346	0.110	10.015%	5.600%
2018	390.000	-0.265	0.791	0.031	7.510%	9.570%
2019	459.000	-0.222	0.824	0.026	6.530%	6.810%

Source: Authors' calculation

The results of Mann-Whitney U test show that there is no statistically significant difference measured by ROA between domestic and foreign audit companies (Table 5). However, the analysis of median shows that ROA of domestic audit companies in eight observed years (beginning from 2010 and concluding with 2017) is higher than ROA of foreign audit companies, while the foreign audit companies, according to ROA, only in two observed years (in 2018 and 2019) are more profitable than domestic audit companies.

For the purpose of testing the third set hypothesis that examines the existence of conditionality between market participation of audit companies and profitability, a Mann-Whitney U test was performed. Market participation of audit companies was established based on participation of operating revenues of the each company in total operating revenues of all audit companies realized in that year of the analysis. In order to examine the influence of market participation of audit companies on ROA, audit companies were divided into two groups: group 1 – market participation up to 5% and group 2 – market participation higher than 5 %. The third hypothesis is broken into $H_{3.1}$ where the profitability is measured by the amount of obtained net income and $H_{3.2}$ where the profitability is measured by ROA.

– $H_{3.1}$ Market participation of audit companies does not impact significantly the profitability measured by the amount of obtained net income.

Table 6. Results of Mann-Whitney U test – market share and net income

	Mann-Whitney U	Z	Sig.	r	Median for up to 5%	Median for more than 5%
2010	28.000	-1.655	0.098	0.194	7,140.48	16,391.76
2011	41.000	-1.342	0.179	0.157	5,577.43	11,432.00
2012	41.000	-1.450	0.147	0.170	5,101.30	8,954.00
2013	42.000	-1.912	0.056	0.224	4,910.28	14,159.60
2014	34.000	-2.155	0.031	0.252	4,958.61	25,554.00
2015	34.000	-2.291	0.022	0.268	6,081.33	50,404.50
2016	20.000	-2.739	0.006	0.321	2,459.72	47,457.00
2017	24.000	-2.687	0.007	0.314	2,165.37	25,804.25
2018	22.000	-2.730	0.006	0.320	2,583.84	12,918.25
2019	3.000	-3.372	0.001	0.395	2,655.81	53,954.50

Source: Authors' calculation

Mann-Whitney U test showed that in the period from 2014 to 2019 there is a statistically significant difference ($p < \alpha$) between obtained net income of audit companies that have market participation up to 5 % and audit companies that have market participation higher than 5% (Table 6). From 2014 concluding with 2018 that difference is of a medium intensity, while in 2019 that difference is between medium and high intensity. The analysis of medians shows that in all observed years the median of net income of audit companies that have market participation higher than 5% is higher than median of net income of audit companies, the market participation of which is up to 5%.

– $H_{3.2}$: Market participation of audit companies does not impact significantly the profitability measured by ROA.

The results of the performed Mann-Whitney U tests are shown in Table 7. ROA of audit companies that have market participation of up to 5 % and audit companies that have market participation higher than 5% is statistically significantly different only in 2010 and 2011 ($p < \alpha$). The established difference is of medium intensity. However, in eight observed years the median of companies with market participation up to 5% is larger than the median of the companies with market participation higher than 5%, while the reverse is only in two observed years.

Table 7. Results of Mann-Whitney U test – market share and ROA

	Mann-Whitney U	Z	Sig.	r	Median for up to 5%	Median for more than 5%
2010	18.000	-2.165	0.030	0.371	25.860%	5.665%
2011	27.000	-1.991	0.047	0.315	20.460%	3.285%
2012	32.000	-1.803	0.071	0.282	22.455%	3.160%
2013	52.000	-1.514	0.130	0.236	22.655%	4.120%
2014	67.000	-1.044	0.297	0.143	16.280%	7.180%
2015	95.000	-0.452	0.651	0.059	15.070%	11.815%
2016	106.000	-0.233	0.816	0.030	4.940%	8.840%
2017	82.000	-1.129	0.259	0.139	9.270%	4.555%
2018	64.000	-1.583	0.113	0.196	8.910%	1.930%
2019	128.000	-0.242	0.808	0.028	6.280%	7.275%

Source: Authors' calculation

5. CONCLUSIONS

Based on the result of performed researches it is possible to draw the following conclusions on tested hypotheses:

– $H_{1.1}$: The size of audit companies significantly impacts the profitability measured by the amount of obtained net income.

The results of the performed test show that in each observed year there is a statistically significant difference in the amount of net income between audit companies of different sizes. These results suggest a conclusion that small and medium audit companies measured by net income are more profitable than macro companies, so that the hypothesis $H_{1.1}$ is accepted. Such conclusion additionally supports the analysis of median which is the highest in medium companies in seven observed years, in small companies in three years, while in micro companies it is the lowest in all analyzed years.

– $H_{1.2}$: The size of audit companies significantly impacts the profitability measured by ROA.

The performed test did not discover a statistically significant difference among ROA in audit companies of various sizes. However, when median of ROA of micro, small, and medium companies is analysed, it is noted that in seven observed years, median of ROA is the highest in micro audit companies, while in three observed years median of ROA is the highest in small companies. Median of ROA of medium companies is the lowest in seven observed years, with micro companies in two, and small ones in one year. Thus, this hypothesis is partially accepted because medians of ROA indicate that most frequently the most profitable are micro companies in the analysed period (and then small companies) since the performed test did not discover a statistically significant difference.

Thus, if the profitability is measured by the ROA, micro and small audit companies are, generally, more profitable than medium audit companies. Contrary to this conclusion, the size of a company impacts the profitability measured by net income since the results of the research have indicated that medium companies are more profitable than small ones, while the small ones are more profitable than micro ones.

– $H_{2.1}$ The origin of audit companies' equity significantly impacts the profitability measured by the amount of obtained net income.

The test results show that although only in the period 2017-2019 there is a statistically significant difference between obtained net income of domestic and foreign audit companies. The hypothesis $H_{2.1}$ can be accepted since the analysis of medians unequivocally shows that net income of foreign audit companies is higher than obtained net income of domestic audit companies in all years of analysis.

– $H_{2.2}$ The origin of audit companies' equity significantly impacts the profitability measured by ROA.

The results of performed tests did not show the existence of a statistically significant difference between ROA of domestic and foreign audit companies. However, the analysis of medians clearly shows that ROA of domestic audit companies in eight out of 10 observed years (2010-2017) is higher than ROA of foreign audit companies. The hypothesis $H_{2.2}$ is partially adopted since the analysis of medians suggests the conclusion that domestic audit companies are more profitable than foreign ones.

Thus, it can be concluded that if the profitability is measured by absolute amount of net income, foreign audit companies are more profitable than domestic ones. If the profitability is measured by ROA, domestic audit companies are more profitable than foreign companies. Foreign audit companies realize higher net profit, but since they have significant engaged assets, in the relative indicator (ROA) they lose leading position based on this indicator of profitability. Thanks to fewer assets they possess, domestic audit companies are more profitable.

– $H_{3.1}$ Market participation of audit companies does not significantly impact the profitability measured by the amount of obtained net income.

The results of performed tests have shown the existence of statistically significant difference between obtained net income of audit companies that have market participation of 5% and audit companies that have market participation higher than 5% in six observed years. Also, the median analysis of net income in all observed years of these two groups of audit companies has confirmed that companies with market participation higher than 5% have larger median of net income than the companies whose net participation is up to 5%. If the profitability is measured by absolute amount of net income, audit companies that have larger market participation are more profitable than audit companies that have less market participation, which implies the conclusion that this hypothesis is rejected.

– $H_{3.2}$ Market participation of audit companies does not impact significantly the ROA.

The test results indicate that ROA of audit companies that have market participation of up to 5 % and audit companies that have market participation higher than 5% is statistically significant only in 2010 and 2011. The analysis of medians indicates that in eight observed years the median of the companies with market participation of up to 5 % is higher than the median of the companies with market participation higher than 5%. Such results lead to the conclusion of partial rejection of $H_{3.2}$ hypothesis, because the analysis of medians indicates that market participation impacts ROA of the audit company. Thus, the claim that market participation of audit companies does not impact ROA can be partially rejected, because if the profitability is measured by net income, the companies with higher market participation are more profitable, while such ascertainment with relative indicator can be partially expressed.

Regardless of the size, the origin of equity or the volume of market participation of a company, profitability of the audit company as an exclusive motif and imperative must not be a priority at all costs. Namely, audit companies must

comply with the rules of profession in providing auditing services and perform audit in accordance with auditing standards (IFAC, MSR,) and requirements of regulation norms (Auditing Act, 2019). In RS the COA is a professional association that takes care of the quality of work of audit companies, auditing services and keeps the register of issued certificates to the licensed auditors and work permits of audit companies. If audit companies ignore the rules of the profession in their business the Ministry of Finance of RS will order the company to remove the irregularities, conditionally revoking the work permit for two or five years. The CAA takes care of conducting these measures, and transparently keeps the register of issued measures as shown in the Table 8.

Table 8. Review of declared measures to audit companies and independent auditors

No.	Audit company	Declared measure of the Chamber	Date
1.	Vinčić d.o.o Novi Beograd	The audit license is conditionally revoked for two years	14/01/2020
2..	FULL REVIZIJA Surčin	The audit license is revoked for a period of five years	14/08/2018
3.	MILINKOVIĆ AUDIT d.o.o. Beograd	It is ordered to eliminate the irregularities identified in the work control procedure	23/06/2017
4.	BOJIĆ REVIZIJA d.o.o. Šabac	It is ordered to eliminate the irregularities identified in the work control procedure	23/06/2017
5.	ABSOLUTE AUDIT d.o.o. Beograd	It is ordered to eliminate the irregularities identified in the work control procedure	23/06/2017
6.	"Rosh Audit" d.o.o. Beograd	It is ordered to eliminate the irregularities identified in the work control procedure	21/12/2016
7.	FINREVIZIJA d.o.o. Beograd	It is ordered to eliminate the irregularities identified in the work control procedure	21/12/2016
8.	AUDITOR d.o.o. Beograd	It is ordered to eliminate the irregularities identified in the work control procedure	21/12/2016
9.	DIJ-AUDIT d.o.o. Beograd	It is ordered to eliminate the irregularities identified in the work control procedure	23/09/2016
10.	"STANIŠIĆ-AUDIT" d.o.o. Beograd	It is ordered to eliminate the irregularities identified in the work control procedure	23/09/2016
11.	ACA professional audit company d.o.o. Beograd	It is ordered to eliminate the irregularities identified in the work control procedure	23/06/2016
12.	Libra Audit d.o.o. Novi Sad	It is ordered to eliminate the irregularities identified in the work control procedure	23/06/2016
13.	REVIZIJA doo Beograd	The audit license is revoked for a period of five years	15/01/2016

Source: (http://www.kor.rs/registri_preduzeca.asp), time of preview March 2019

No matter how much the profit may be the leading motive for the funding an audit company the main stumbling block for doing this job is having a certified auditor's license, which implicitly implies having sophisticated knowledge and experience in this field, which is the main obstacle to entering this business.

ACKNOWLEDGEMENTS

The authors declare that there is no conflict of interest.

REFERENCES

Agencija za privredne registre. (n.d.). Available at:: https://www.apr.gov.rs

Al Ani, M., Salim, B. & Al Enyi, J. (2017). Auditor Selection: Big four or Non - Big Four? Case of Oman. *International Business Management*, *11*(5), 1087 – 1095.

Bogićević, J., Domanović, V., & Obradović, V. (2020). Agriculture, Forestry and Fishing Sector Profitability in the Republic of Serbia, *Fresenius Environmental Bulletin*, *29*(11), 9730-9740.

Chen, Yahn-Shir., Yang, Chung.-Cheng. & Yang, Yi-Fang. (2020). Higher Academic Qualifications, Professional Training and Operating Performance of Audit Firms. *Sustainability, 12*(3), 1254 – 1270.

Francis, J. (2004). What do we know about audit quality? *The British Accounting Revie, 36*(4), 345 – 368.

Jakšić, D., Mijić, K. & Bonić, Lj. (2015). Sličnosti i razlike u performansama revizijskih firmi u Srbiji. *Ekonomske teme, 53*(4), 549 – 559.

Jovković, B. & Ljubisavljević, S. (2015). Analysis of the profitability of audit firms in the Republic of Serbia between 2010 and 2012. *Contemporary Issues in Economics, Business and Management – EBM 2014,* 537 – 557. Kragujevac: Faculty of Economics University of Kragujevac.

Komora ovlašćenih revizora (n.d.). Dostupno na: https://www.kor.rs/registri_izdatih_sertifikatai.asp

Kondić, N. & Petrović, N. (2008). Javni nadzor nad revizorskom profesijom i kontrola kvaliteta rada revizora i revizorskih firmi. *Acta Economica*, *6*(8), 123 – 153.

Ljubisavljević, S. & Jovković, B. (2016). *Revizija finansijskih izveštaja.* Kragujevac, Srbija: Ekonomski Fakultet Univerzitet u Kragujevcu.

Marinković, V. & Senić, V. (2012). Analiza elemenata kvaliteta usluga u korporativnom bankarstvu. *Ekonomski horizonti, 14*(1), 13 – 22.

Mijić, K., Jakšić, D. & Vuković, B. (2014). Uticaj saturacije revizorskog tržišta na poslovanje novih revizorskih firmi. *Ekonomski pogledi, 16*(3), 27 – 37.

Milenković, M. (2018). Revizorske firme u Srbiji 2017. *Revizor, 21*(83), 47 – 56.

Mrdak, G. (2019). Revizorske firme u Srbiji 2018. *Revizor, 22*(6), 19 – 29.

International auditing and assurance standards boards. (n.d.). MSR. Dostupno na: https://www.iaasb.org/standards-pronouncements

Pallant. (2011). *SPSS – Priručnik za preživljavanje*. Beograd: Mikro knjiga.

Pobrić, A. (2019). The application of fair value accounting in Bosnia and Herzegovina. *Acta Economica, 17*(31), 149 – 167.

Serdar, T. & Vranješ, S. (2013). Otkrivanje i sprečavanje finansijskih prevara u cilju jačanja finansijskih performansi preduzeća u Republici Srpskoj. *Acta Economica*, *11*(19), 179 – 200.

Vučenović, S., Milovanović, D. & Grahovac, M. (2015). Finansijska konkurentnost privrede Republike Srpske. *Acta Economica, 13*(23), 49 – 68.
Zakon o računovodstvu ("Službeni glasnik Republike Srbije", br. 73/2019).
Zakon o reviziji ("Službeni glasnik Republike Srbije", br. 73/2019)

ПРОФИТАБИЛНОСТ РЕВИЗОРСКИХ ПРЕДУЗЕЋА У РЕПУБЛИЦИ СРБИЈИ: ЕМПИРИЈСКО ИСТРАЖИВАЊЕ У ПЕРИОДУ 2010-2019.

[1] Биљана Јовковић, Универзитет у Крагујевцу, Економски факултет, Србија
[2] Немања Карапавловић, Универзитет у Крагујевцу, Економски факултет*, Србија
[3] Александра Радојевић, Универзитет у Крагујевцу, Економски факултет, Србија

САЖЕТАК

Предмет истраживања у раду је оцјена профитабилности пословања ревизорских предузећа у Републици Србији. Циљ истраживања јесте да пружи одговор стручној и научној јавности да ли је профитабилност ревизорских предузећа условљена величином ревизорског предузећа, поријеклом сопственог капитала или постојећим тржишним учешћем. Истраживање је обухватило цјелокупну популацију активних ревизорских предузећа у Републици Србији у периоду од 2010. до 2019. године. Анализа података је извршена у статистичком програму СПСС, а коришћени су непараметарски тестови Крускал-валис Х тест и Ман-витни У тест. Истраживање даје одговор на питање да ли профитабилност ревизорског предузећа зависи од извора сопственог капитала, величине или тржишног учешћа које има у пружању ревизорских услуга. Резултати истраживања показују да постоји веза између: величине предузећа, поријекла сопственог капитала и тржишног учешћа и профитабилности предузећа мјерене нето резултатом или стопом приноса на укупна средства. Не може се извести идентичан закључак о профитабилности ревизорских предузећа када се као мјерило користи апсолутни износ нето резултата и када се користи релативни показатељ – принос на укупна ангажована средства (РОА рацио). Наиме, добијају се неконзистентни резултати када се профитабилност мјери апсолутном и релативном мјером. Добијени резултати истраживања потврђују хипотезе $X_{1.1}$ и $X_{2.1}$ док дјелимично потврђују хипотезе $X_{1.2}$ и $X_{2.2}$. Резултати истраживања оспоравају прихватање хипотезе $X_{3.1}$ у потпуности и дјелимично одбијање хипотезе $X_{3.2}$.

Кључне ријечи: *ревизорско предузеће, профитабилност, услуге ревизије, ROA, нето резултат.*

Претходна саопштења
Preliminary Announcements

CREDIT POLICY OF BANKS IN THE FUNCTION OF DEVELOPING THE ECONOMY OF REPUBLIC OF SRPSKA

1 Dragana Bašić, University of Banja Luka, Faculty of Economics,
Banja Luka, Bosnia and Herzegovina
2 Predrag Ćurić, NLB Bank a.d. Banja Luka, Banja Luka, Bosnia and Herzegovina
* Email of the corresponding author: dragana.basic@ef.unibl.org
1 ORCID ID: 0000-0001-8391-3339
2 ORCID ID: 0000-0001-7486-0167

ARTICLE INFO

Preliminary Announcement
Received: 20.10.2020
Revised: 22.02. 2021
Accepted: 23.02.2021

doi 10.7251/ACE2134225B
UDC
330.191.6:336.745(497.6RS)

Keywords: *banking sector, credit rating, financial discipline, credit policy, credit risk.*

JEL Classification: G21

ABSTRACT

The banking sector of Republika Srpska features a high level of legal and regulatory compliance, and can be defined as conservative banking with deposits as the main source of business and loans as their fundamental product. The availability of funds for lending under favourable conditions in the economy is the fundamental and most important function provided by the banking sector, even though its role is crucial in executing payment transactions as well as providing security in savings products. As per expectations, quantitative analysis shows a very high level of correlation between the changes in the volume of bank loans and the changes in the gross domestic product in Republika Srpska. On the one hand, the credit policy of banks represents an important basis for the development of enterprises and the economy, and for the business of banks, on the other. Banks obtain the highest revenues from the active interest rates, and through defining an adequate credit policy with respect to the conditions existing in the economic environment, they can make their operations more secure and profitable. By using the data from the survey questionnaire, we investigated the extent to which the credit policy of banks affects the financial stability and business operations of companies in Republika Srpska.

1. INTRODUCTION

The development of the banking sector in Republika Srpska was not aimed at the rehabilitation of existing domestic banks, but was mostly focused towards the opening of the banking system for the inclusion of foreign banks. Acquisitions and opening of new banks have brought to the strengthening of competition, which, along with a higher level of prudential control has led to the overall im-

provement of the quality of the banking sector operations. In parallel with such processes, regulations of the Banking Agency of Republika Srpska were developed and mostly based on the regulations and directives of the European Union. However, the credit policy of banks directs the extent to which their business operations will adapt to the economic environment of Republika Srpska. Such policy should be based on the assumption that in the course of approving a loan, a bank should consider and follow the market criteria in terms of client selection, i.e., the ones that are capable, able and should do business and the ones that do not have a healthy business perspective. In addition, it is necessary to analyse the country's credit rating, which is used as a general risk assessment measure for any business entity in the given country. The unsuited credit policy represents a limiting factor that inhibits the banking sector to encourage investment and development of business entities. In addition, an important element is the capability of the banking sector to provide sources of financing under the most favourable conditions. The interest of the economy is to have the banks acting in the direction of increasing competitiveness and adapting the credit policy to the needs of business entities.

This paper is based on the empirical research performed on a representative sample of large enterprises operating in Republika Srpska. The set hypothesis that has been proven in the paper reads as follows: "Adequate adaptation of the banking sector credit policy to the particularities of the economic environment contributes to development of the economy of Republika Srpska".

Given the vast importance of bank loans for the business operations of companies, the primary research problem to be considered in this paper are the levels of adjustment of certain aspects of banking operations that define the creation of the credit policy of banks.

In addition, the paper shall attempt to identify the positive impact of the respective credit policies of banks provided that they are adjusted and suited to the conditions of the business environment.

2. MATERIALS AND METODOLOGY

Credit policy is usually defined as a set of principles followed by the managerial structures of a bank in the course of deciding on credit placements (Muratović, 2013). It is "a segment of and the most important part of the bank's business policy, aimed at achieving the expected profit rate with an acceptable risk level". The credit polices of banks represent an important foundation both for the development of enterprises and the economy on the one hand, and for the opera-

tions of banks, on the other. Banks obtain the highest revenues from the active interest rates, and through defining an adequate credit policy with respect to the conditions existing in the economic environment, they can make their operations more secure and profitable. Such policy should be based on the assumption that at the time of approving a loan, a bank should respect the market criteria in the process of classifying clients into the ones able and capable to do business and those without a healthy business perspective. In addition, it is necessary to analyse the country's credit rating which is used as a general risk benchmark for all economic entities in the subject country (Bessis, 2002, p. 16). To an extent, this risk depends on the institutional framework in which the banking sector operates (Freixas and Rochet 1999, p.221).

Table 1. Current Credit Rating of Bosnia and Herzegovina with both agencies

	Moody's Investors Service	**Standard & Poor's**
Rating	"B3" – stable outlook	"B" – stable outlook
Date	26 February 2016	8 September 2017
Activity	Rating confirmed	Rating confirmed

Source: Moody's Investors Service and Standard & Poor's. Updated: 2 January 2017.

According to the assessment from both agencies, Bosnia and Herzegovina is rated as a country with non-investment risk level, whereas the specific credit rating category (Moody's Investors Service – "B3" and Standard & Poor's – "B") is described as a "speculative grade, high credit risk".

Such classification from credit rating agencies indicates an increased risk of a country, due to which banks in their own credit policies seek to increase interest rates and the volume of collateral when approving loans. The above further negatively affects the level of investment and the possibilities of developing the economy as a whole.

The credit policies of banks should be viewed not only from the perspective of obtaining short-term benefits, but also from the considerably broader standpoint, i.e. it is necessary to establish long-term goals (Jurman, 2007). From the aspect of banking operations, it is necessary to adapt the bank's credit policy to the capabilities of its own credit potential and liquidity (Miletić and Bingulac, 2016). The research (Hamid, 2012) found that banks with a lower "capital adequacy ratio", poor liquidity, higher active interest rates (which indicated a more liberal credit policy) and a higher "loans placed to assets ratio" failed to overcome the conditions of the crisis. Likewise, the liberal policy of lending to the clients with poor credit standing proved to be profitable in the short term, but highly

unfavourable for the banking and overall financial system in the long run. The research (Okirika, 2011) suggests that such practice is common in developing countries and that it particularly involves medium-sized and small banks.

It is evident that credit policy must be based on numerous aspects that affect the business of a company, since most financial and accounting information is the subject to a certain risk which is actually less than a credible presentation of what they claim to represent (Jahić, 2008). A superior and more comprehensive assessment of the client's financial situation and the risks to which he/she is exposed to is obtained through the International harmonization of banking control and supervision aimed at introducting a unique set of accounting standards for the purpose of improving the transparency and mutual comparability of financial information in order to ensure their quality, sufficiency and timely deliverance (Bašić, 2012).

The research (Emuwa, 2015) finds that the introduction of specific credit analysis methods that emphasize factors of the business environment, specialized staff, specific organizational units and more detailed monitoring which includes regular visits to clients, may significantly increase the bank's loan portfolio and income.

Data collection on the level of compliance of credit policy to the economic environment was performed with the use of a survey questionnaire. Statistical data processing was performed by using the SPSS statistical software suite. In the course of data processing and for the purpose of testing the given hypothesis, the statistical methods of regression analysis and correlation were applied.

The availability of funds for lending to the economy on favourable terms is the most important function provided by the banking sector. In order to accelerate the development of the national financial system, the governments of the transition countries and developing countries should pay full attention to creating conditions for increasing the efficiency of the banking system (Mikerević, 2010, p. 46). A statistical analysis shows that a very strong positive link is expected to be established in Republika Srpska between changes in the volume of bank loans and gross domestic product.

Over the past 13 years, the gross domestic product (GDP) of Republika Srpska features a slight growth trend, accompanied by a constant increase in the indebtedness of the population, businesses and the state. As of the end of 2016 debt level amounts to 4, 85 billion BAM. Due to the given debt level, it is necessary to pay increasing attention to the credit policy applied by the banks.

Table 2. GDP of Republika Srpska and Debt in the Banking Sector

(Millions of BAM)

Year	GDP of Republika Srpska	Debt in the Banking Sector		
		Total debt of the economy	Total debt of the population	TOTAL
		1	2	1+2
2004	5,115.60	601.00	687.00	1,288.00
2005	5,693.00	878.30	908.30	1,786.60
2006	6,546.50	1,147.40	1,252.30	2,399.70
2007	7,352.00	1,417.90	1,725.80	3,143.70
2008	8,490.60	2,117.20	2,143.30	4,260.50
2009	8,236.30	2,142.40	2,001.70	4,144.10
2010	8,318.20	2,337.70	2,018.80	4,356.50
2011	8,682.40	2,404.30	2,150.60	4,554.90
2012	8,584.97	2,542.80	2,190.70	4,733.50
2013	8,760.80	2,645.90	2,232.00	4,877.90
2014	8,847.12	2,327.00	2,374.30	4,701.30
2015	9,205.03	2,438.13	2,485.35	4,923.48
2016	9,630.56	2,337.98	2,517.14	4,855.12

Source: Statistical Office of Republika Srpska, Banking Agency of Republika Srpska, Note: The loans that banks from the Federation of BiH placed in RS are included, whereas the loans that RS banks have placed in the Federation of BiH are excluded.

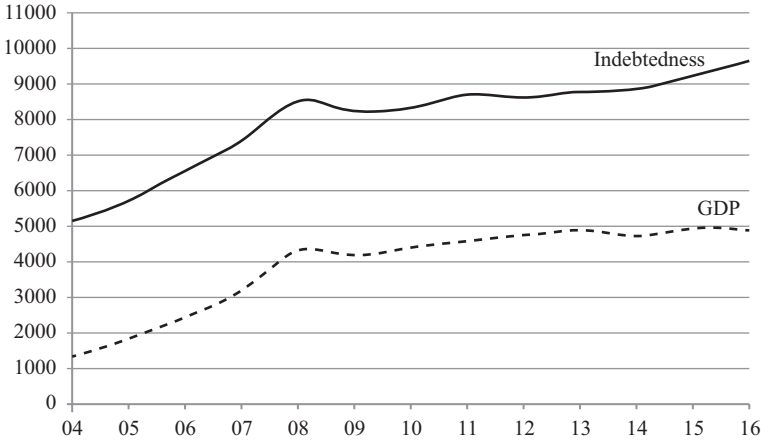


Chart 1. Movement of Republika Srpska's GDP and the overall debt of the economy and population in the domestic banking sector
Source: Data processing performed by the Author

The above table and chart show a constant increase in the debt of the economy of Republika Srpska in the banking sector over the past 13 years. In the given period, the debt increased by 277% (from 1,288 million BAM to 4,855 million BAM). GDP growth is also noticeable, having increased in the same period by 88% (from 5,115 million BAM to 9,630 million BAM).

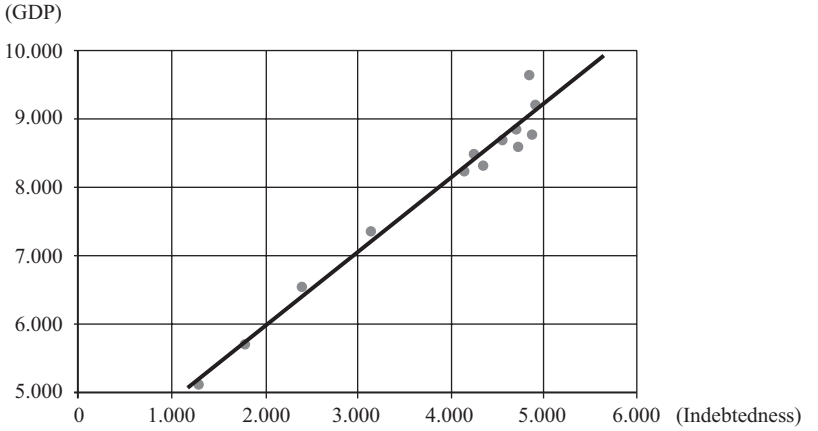


Chart 2. Graphical Representation of the Regression Analysis Results
Source: Data processing performed by the Author

The regression equation is as follows: $Y = 3824.709 + 1.074 \times X$

The regression coefficient, which stands at b = 1,074, indicates that, with the unit increase in total debt, the volume of GDP also increases by 1 on average. Such ratio is not favourable for such long period and a higher relative GDP growth is required. The situation is even more unfavourable when taking into account the debt of Republika Srpska to the International Monetary Fund, existing in addition to the indebtedness of the domestic banking sector. The debt of Republika Srpska to the IMF at the end of 2017 amounted to 198 million BAM (The International Monetary Fund, 2017).

The variation coefficient is extremely low, amounting to $V_{\hat{y}} = 2.821\%$, and indicating the high accuracy level of the regression model. Based on the above, it can be concluded that the real GDP values in the regression model deviate from the estimated values by an average of just 2.821%.

The correlation coefficient r = 0.9855 indicated the nearly perfect positive condition for the growth of the total debt of the economy in the banking sector and of GDP. Such positive interdependence is economically justified and indicates an extreme significance of financial resources for the increase in the economic ac-

tivities of Republika Srpska's economy. Consequently, the importance of credit policies applied by individual banks when approving loans is also increasing. Therefore, it is necessary to maximally harmonize all the individual factors influencing the placement of credits with the specifics of the economic environment of Republika Srpska.

Certain industries contribute to the total value of GDP in various aspects and in different amounts. Gross value added within depends on a number of factors (development level of a field/industry, natural resources, etc.), including the defined credit policy of banks that further directs the access to sources of financing.

Table 3. Debt by individual industries and gross value added to each of them

(in 000 BAM)

FIELD	Gross value added	Debt of the given industry
Agriculture	900,171	86,754
Mining and Industry	1,778,030	684,254
Construction	472,126	213,884
Trade	1,072,414	617,073
Transport, storage, postal service, communications	293,741	69,767
Tourism and hospitality	140,749	50,157
Finance	289,260	36,063
Real estate	409,419	109,507
Public services	915,815	576,167

Source: The Statistical Office of Republika Srpska, Banking Agency of Republika Srpska.

The correlation coefficient between gross value added and the debt within certain economic fields is r = 0.85. This indicates a high correlation between the stated amounts and we can thus conclude that borrowing and compliance of the credit policies of banks is an important factor for the development of individual fields of economy.

The impact of the banking sector credit policy onto the development of Republika Srpska's economy is determined by limiting the exclusion of other determinants affecting financial stability, such as foreign direct investment, credit arrangements with the World Bank and the International Monetary Fund, financial market transactions, credit placements of microcredit organizations and issuance of government securities, which are mostly bought by banks (Banking Agency of Republika Srpska, 2017, page 25).

3. RESEARCH RESULTS REGARDING THE COMPLIANCE OF THE CREDIT POLICY OF BANKS WITH THE ECONOMIC ENVIRONMENT IN REPUBLIC OF SRPSKA

Given that the banking sector had a multi-dimensional influence on the development of the national economy and that it had a very unpredictable and significant role in the period of the global economic crisis, there has been a significant increase in the interest for studying and clarifying the nature of the interconnection between the credit policy of banks and the financial parameters of the borrower within a national economy. The paper focuses on the issue of the impact of the credit policies of the banking sector on the financial stability of the national economy. The subject of research are large enterprises in Republika Srpska, models for determining the company's credit rating, theoretical overview of defined relationships between the credit policies within the banking sector and the performance of business entities. The aim of the research is to determine the cause-effect relationship and the intensity of the dependence between the quality of bank lending practices and the economy development. The basic hypothesis is directly derived from the problem the research is focused on and, therefore, it reads: "*Adequate adaptation of the banking sector credit policy to the particularities of the economic environment contributes to the development of the economy of Republika Srpska*". Based on the understanding of the level and method of applying certain lending practices of the banking sector, the necessity of adjustment of credit policy to the economic environment has been elaborated.

In order to determine the level of compliance of the credit policy with the financial needs of a company and the economic specifics of Republika Srpska, we conducted a survey, the basis of which was the function of financial management in companies and the standards of banking operations defined by the Banking Agency of Republika Srpska. The questions from the survey referred to certain aspects of banking operations that define the establishment of the credit policy of banks. The results of the surveyed 188 large enterprises are shown in the following table.

Table 4. Results of the questionnaire for assessing the suitability of the credit policy of banks to the needs of the company and the specifics of the business environment

Line No.	Questions	Reply of the company		
		Yes	No	Partially
1.	Are all the necessary data on loan lending conditions available to the company and without obligatory visit to the premises of the bank?	91	43	54
2.	Are banks ready to offer better loan terms due to long-term of successful cooperation?	103	12	73
3.	Is the interest rate more important when selecting a bank for your company in relation to other lending terms (such as: application processing speed, number of guarantors, mortgage value, etc.)?	80	24	84
4.	When making decisions on loans, do banks primarily focus on the capabilities and abilities of collecting loans, i.e. sufficient collateral?	158	12	18
5.	Has your company ever experienced the rejection of the same (or very similar) loan request in one bank, and the approval in the other?	48	121	19
6.	Has your company ever experienced the rejection of a loan request the first time, but the approval the second time, with the same bank?	24	158	6
7.	Have you had the experience to have your company classified in different categories of bonuses without significant changes in business operations and credit history?	49	121	18
8.	Has the company changed its loan-providing bank in its business to this day?	72	85	31
9.	Does the company use simultaneous multi-bank loans?	116	54	18
10.	Has the company fully settled in its operations all of its loans with a bank by a loan granted by another bank to this day?	48	116	24
11.	Has the company used credit arrangements approved by several banks simultaneously?	12	176	0
12.	Do you think that financial service customers are sufficiently protected as consumers in relation to banks?	6	128	54
13.	Do you think that the effective interest rate (EIR) is clearly stated and fully visible in the bank's premises, in advertising and in media?	30	61	97
14.	Has the bank you do business with requested your opinion on the compliance of its credit policy with the needs of your company or the economic environment in Republika Srpska?	18	146	24
15.	In your opinion, is the credit policy of the bank you are a client of, suited to the specifics of the economic environment of Republika Srpska?	48	36	104

Source: Data processing performed by the Author

From the table above, it can be concluded that the interest rate is crucial when choosing a bank for a company and that the data on the interest rate level are available even without visiting the bank. In addition, it was established that banks appreciate long-term successful cooperation and the proper settlement of liabilities by clients. In such cases, 55% of enterprises received more favourable loan terms in comparison to new clients. Nevertheless, the companies are still very prone to changing banks. Thus, 38% of enterprises completely changed their loan-providing bank, while as many as 62% use loans at several banks simultaneously.

Based on the results of the survey, it was noted that 84% of companies think that in the process of making decision on loan approval primarily banks focus on the capabilities and possibilities of collecting loans or collateral. Such conduct of the banks with respect to the loan approval procedures are mainly justified given that the current credit rating of Bosnia and Herzegovina with both agencies (Moody's Investors Service and Standard & Poor's) is unfavourable (speculative grade) and indicates a significant level of credit risk at the level of the entire state economy. However, in the effort to minimize credit risk solely by insisting on extensive collateral, banks restrict the business of companies, as well as their ability to invest and implement development projects.

In addition to the above closed-type questions, the questionnaire also contained open-ended questions in which the company's opinion on the methodology of banks for loan approval is required, as well as positive and negative experiences in cooperation with the banks. This section describes a number of cases in which certain companies were not granted an investment loan in one bank, only to have it approved and properly repaid in another bank. Such cases indicate the limited orientation of banks towards granting the investment loans. In addition to the above, the views and experiences of large companies on the work of banks indicated the following:

- Lack of consideration of the specifics of the industry which the company operates in;
- Finding opportunities with banks to shorten the time needed to process credit applications;
- Unjustified retainment of high-level reference EURIBOR interest rate with approved variable interest rate loans;
- Insufficient data confidentiality with respect to credit arrangements;
- Undue takeover of collateral that is significantly more valuable than the loan;

– Untimely information on the associated costs arising when approving and utilising the loan.

The mentioned statements of large companies should have been taken into account by the banks who strive to maximally adjust their credit policy to the economic environment of Republika Srpska. Thus, more favourable conditions for the implementation of investment projects and a greater volume of bank loans would be created in the form of investment loans.

4. DISCUSSION ON RESEARCH RESULTS REGARDING THE COMPLIANCE OF THE CREDIT POLICY

The level of compliance of the real and financial sector affects the effect of feedback generated from the interconnection and conditionality of these sectors. In the economic environment of Republika Srpska, characterised by the underdevelopment of its financial securities market, there is a significant emphasis on the role of commercial banks in the economy. Such market conditions cause banks to feature a prominent role in resource allocation processes, meaning that the credit policy of the banking sector is thus imposed as a crucial factor affecting overall economic efficiency, economic growth and social development.

If we were to take into account the vast importance of financial resources for the growth of economic activity of the economy of Republika Srpska, it can be stated that the standpoints of large enterprises mentioned in the survey questionnaire largely reflect the financial conditions of business conduct of these companies, and thus of the economy as a whole. Particularly negative attitude of the companies from the representative sample referred to the requirements of banks in terms of collateral, that is, the collateral multiple times greater compared to the amount of the bank loan itself. Accordingly, the companies stress that the most important element that banks focus on when making credit decisions is to provide security in case of forced collection of the loan. This indicates that banks, within the framework of their own credit policies, invest insufficient effort to minimize credit risk with respect to the analysis of project documents, business operations and the assessment of the situation within the industries which the given enterprises operate in. Doing so would allow meeting certain preconditions for the implementation of well prepared and high-grade projects in which collateral is a limiting factor, thus allowing an increase in the volume of investment loans within the real sector, as well as the strengthening of the positive feedback effect onto the development of the banking sector.

5. CONCLUDING REMARKS

Nowadays, loans emerge as one of the most important instruments for the development of the overall economic activities of any country. It is precisely the banking sector that plays a key role in the process of securing sources of financing for the purpose of economic growth and social development. Quantitative analysis has shown that Republika Srpska is expected to achieve a very strong positive connecetion between the changes in the volume of bank loans and the change in the gross domestic product. In addition, quantitative analysis also indicates a significant correlation between production volumes and the volume of indebtedness by certain industries.

Bosnia and Herzegovina has been rated as a country with non-investment risk level, whereas the specific credit rating category (Moody's Investors Service – "B3" and Standard & Poor's – "B") is described as a "speculative grade, high credit risk". Such classification by credit rating agencies indicates an increased risk of a country, due to which the banks in their own credit policies seek to increase interest rates and the volume of collateral when approving loans. The above further negatively affects the level of investment and the possibilities of developing the economy as a whole.

The results of the conducted survey indicate that 84% of the companies think that, in the process of making decision on loan approval, banks primarily focus on the capabilities and possibilities of collecting loans or collateral. This indicates that banks, within the framework of their own credit policies, invest insufficient effort to minimize credit risk with respect to the analysis of project documents, business operations and the assessment of the situation in the industries where the given enterprises operate. Doing so would allow meeting certain preconditions for the implementation of well-prepared and high-grade projects in which collateral is a limiting factor, thus allowing an increase in the volume of investment loans within the real sector, as well as the strengthening of the positive feedback effect onto the development of the banking sector. The standpoints of large enterprises mentioned in the survey questionnaire largely reflect the financial conditions of business conduct of these companies, and thus of the economy as a whole.

Conflict of Interest

Dragana Bašić and Predrag Ćurić hereby state that any conflict of interest is non-existent.

REFERENCES

Banking Agency of the Republic of Srpska (2017). *Results of the study of the quantitative impact of the introduction of liquididy coverage ratio* (LCR). Banja Luka, Bosnia and Herzegovina: Author

Bašić, D. (2012). *Savremeno bankarstvo*. (*eng. Contemporary Banking*). Banja Luka, Bosnia and Herzegovina: Faculty of Economics

Bessis, J. (2002). *Risk Management in Banking*, 2nd edition. Chichester, UK: John Wiley & Sons.

Supreme Office for Public Sector Auditing of Republic of Srpska (2016). *Report for Units of Local Self-Governance and Beneficiaries of Budget Revenues of Local Self-Governance Units*. Banja Luka, Bosnia and Herzegovina: Author

Emuwa, A. (2015). *Barriers to SME Lending in Nigeria: Finding Context and Specific Solutions*. Nottingham, UK: The Nottingham Trent University.

Jahić, M. (2008). *Finansijsko računovodstvo: MSFI-MRS-PDV*. Sarajevo, Bosnia and Herzegovina: Association of Auditors of Federation of Bosnia and Herzegovina.

Jurman, A. (2007). *Kreditna politika poslovnih banaka u funkciji učinkovite multiplikacije kredita i depozita* (*eng. Credit Policy of Commercial Banks in the Function of Effective Multiplication of Loans and Deposits*). Rijeka, Hrvatska: Faculty of Economics

Mikerević, D. (2010). *Napredni strateški finansijski menadžment*. Drugo izmijenjeno i dopunjeno izdanje. Banja Luka, Bosnia and Herzegovina: Faculty of Economics and Finrar.

Mikerević, D. (2011). Finansijski menadžment, četvrto izmijenjeno i dopunjeno izdanje. Banja Luka, Bosnia and Herzegovina: Faculty of Economics Finrar.

Miletić, V., & Bingulac, Z. (2016). *Savremene finansije*. Drugo izdanje. Novi Sad, Srbija: Prometej.

Muratović, H. (2013). *Poslovno bankarstvo*. Gradiška, Bosna I Hercegovina: Primus College.

Okirika, T. (2011). *Investigation Into Credit Risk Management Practices in Nigerian Banks*. Buckingham, UK: Buckingham Business School, University of Buckingham.

Standard & Poor's (2017). *S&P Global Ratings Definitions*. Retrieved from: https://www.standardandpoors.com/en_US/web/guest/article/-/view/sourceId/504352

The International Monetary Fund (2017). *Bosnia and Herzegovina: Transactions with the Fund*. Rerieved from: http://www.imf.org/external/np/fin/tad/extrans1.aspx?memberKey1=75&endDate=2017%2D01%2D21&finposition_flag=YES

Freixas, X., & Rochet, J. C. (1999). *Microeconomics of Banking*. 4th edition. London, UK: MIT Press.

Hamid, F. S. (2012). *Essays on Liquidity Risk and Banking Fragility, Dynamic Depositor Discipline and Information*. Exeter, UK: University of Exeter.

КРЕДИТНА ПОЛИТИКА БАНАКА У ФУНКЦИЈИ РАЗВОЈА ПРИВРЕДЕ РЕПУБЛИКЕ СРПСКЕ

1 Драгана Башић, Економски факултет Универзитета у Бањој Луци, Босна и Херцеговина
2 Предраг Ћурић, НЛБ Банк а.д. Бања Лука, Бања Лука, Босна и Херцеговина

САЖЕТАК

Банкарски сектор Републике Српске карактерише висок степен правне и регулаторне уређености, а по карактеру се може сврстати у конзервативно банкарство са депозитима као основним извором пословања и кредитима као основним производом. Расположивост фондова за кредитирање привреде по повољним условима јесте основна и најважнија функција коју осигурава банкарски сектор, иако је његова улога важна и у обављању функције платног промета, као и у пружању сигурности у штедне производе. Квантитативна анализа показује да се у Републици Српској очекивано остварује веома висок степен корелације између промјене обима банкарских кредита и промјене бруто домаћег производа. Кредитна политика банака представља значајну основу како за развој предузећа и привреде, са једне стране, тако и за пословање банака, са друге стране. Највеће приходе банке остварују управо од активних камата и помоћу дефинисања адекватне кредитне политике условима који постоје у привредном окружењу банке могу своје пословање учинити сигурнијим и профитабилнијим. Користећи се подацима из анкетног упитника, истражили смо у којој мјери кредитна политика банака утиче на финансијску стабилност и пословање предузећа у Републици Српској.

Кључне ријечи: *банкарски сектор, кредитни рејтинг, финансијска дисциплина, кредитна политика, кредитни ризик.*

ANALYSIS OF THE IMPACT OF SOCIAL NETWORKS ON THE QUALITY OF LIFE AND EDUCATION OF YOUNG PEOPLE

1 Jelena Jevtić*, Polytechnic-School for New Technologies, Belgrade Serbia
2 Milan S. Dajić**, Technical School Vitina, Vrbovac, Serbia
* Corresponding author E-mail: d.milan@hotmail.rs
1 ORCID ID: 0000-0003-2173-4401
2 ORCID ID: 0000-0003-3265-5012

ARTICLE INFO

Preliminary Announcement
Received: 02. 04.2021
Revised: 13.05.2021
Accepted: 17.05.2021

doi 10.7251/ACE2134239J
UDC
316.774:004.758-053.2

Keywords: *social networks, Instagram, YouTube, young people.*

JEL Classification: A14, I25, L63

ABSTRACT

Social networks are a way of creating a virtual identity and entering into relationships with strangers in a series of interactions that were not known to a man before the existence of the Internet. Mobile phones and the virtual world often create a personality of a person that is not the same in the real world. It can be said that technology has changed the course of humanity and human consciousness and contributed to many changes in the mentality of society, especially among the youth. Children are often overwhelmed by materialism and jealousy, which further encourages them to become an unconscious, immoral and unambitious population. One of the negative effects of social networks is the abuse of privacy, which is also becoming a growing problem everywhere in the world and should not be ignored. However, a positive attitude should be maintained when it comes to social networks, because they facilitate communication, access to information and learning, greater availability of services and free advertising of some products or services. High school students use the Internet intensively every day, and the work raises the question of whether they use it constructively or destructively. The research was conducted in 2019, the population of high school students was observed and 100 students were included on the territory of Belgrade, Niš and Vitina.

* Equal Contribution
**Equal Contribution

1. INTRODUCTION

Social networks have a profound impact on the modern world. At the individual level, "there are negative correlations between the intensive use of social networks, subjective well-being, and mental health" (Allcott et al., 2020). A modern user of social networks is used to having information about happiness available to him now and immediately. He is a "turbo-consumer, accustomed to a hyper individualized hyper-choice, which, therefore, rests on a strong sense of individualized consumption" (Lipoveski, 2008). Alcott also notes that "negative outcomes such as suicide and depression rose sharply during the period when the use of smartphones and social networks expanded" (Allcott, et al., 2020). Social networks have contributed to the undermining of social awareness, democracy and various abuses of rights, despite the fact that they still survive because the positive experiences of their use successfully overcome the negative ones. In order to examine the impact of social networks on the quality of life and education of young people, the following hypotheses were tested:

H1: "*Students have a positive attitude when it comes to the usefulness and the use of social networks";*

H2: *"Social networks have influenced the change in the mood and the quality of life of young people"*

H3: "*Social networks have become an integral part of life, especially among young people".*

Students spend too much time on social media, which often leads to mood swings and addictions, especially when they have experienced some form of abuse, that often puts them in a depressed state and affects their quality of life. On the other hand, they find them useful for learning and education.

For younger, undisciplined people, with insufficiently developed critical awareness, a few clicks bring immense satisfaction, the illusion of happiness and an escapist solution - an escape from studying, learning and school everyday life which require a certain mental effort and discipline. Often, young people on the Internet are looking for a way to break free or escape from the everyday social environment, overcome peer violence, escape from loneliness and misunderstanding of their own peers. In a 2017 longitudinal study, a group of authors, summarizing thousands of previous studies, stated that "there are a significant number of studies that have shown the importance of social interactions for people's well-being" (Sakya & Nicholas, 2017). Interactions that take place through social networks are also included and it is confirmed that "human beings progress faster with social support and positive reactions of the environment and on

social networks" (Sakya & Nicholas, 2017). Bokan (2020) points out that the enjoyment and pleasant incentives that users receive on social networks do not pass without negative consequences. Personal data entered in user profiles are a lure for sellers who advertise their products on social networks and whose sales depend on the attention of users that they manage to attract on social networks. "Namely, the user pays for his virtual experience with exploitation and cashed attention, which is occupied by frequent low-intensity pleasures" (Bokan, 2020).

In the developmental psychology of the child, puberty is marked as "a period when there is a strong need to belong". In social networks such as Instagram, this phenomenon is especially pronounced because it has enabled everyone to show an embellished and hyperbolized version of their life. When young people, looking for their idols, see exaggerated versions of other people's lives, their psychological well-being is disturbed and their psyche is adversely affected.

Young people compare their own reality and everyday life with the one from photography, notice differences and inconsistencies, and this cognitive dissonance is a favorable trigger for developing feelings of inferiority and dissatisfaction with one's own life. Based on the data obtained from the survey, we will see how the mass use of social networks affects the youth in Serbia, from the perspective of high school students, that is how high school students in Niš, Vitina and Belgrade manage on social networks and whether they can recognize violence on the Internet.

2. OVERVIEW OF THEORETICAL IDEAS

"Social networks use social interactions and thus deepen loneliness and depression" (Twerge, 2017). The discontinuity is noticeable in the development of human society from the most primitive communities throughout history to the present moment. Historians and anthropologists talk about discontinuity every time there is a significant change in the way the human community is produced or organized. Chronologically, the closest point of discontinuity to us arose in the 17th century, when, as Giddens (1998) claims, "a special form of organization of society and social life in Europe emerged, which spread further around the world". Post-industrial society and postmodern culture have especially influenced the transformation of identity which in the true sense of the word has become fluid − multidimensional, discontinuous, decentralized, fragmentary, unstable and volatile (Božilović, 2020). At the same time, new tendencies in culture have completely thinned the line between high and popular creativity and thus called into question the status of established, hitherto valid values (Božilović, 2020).

A new point of discontinuity arises precisely with the mass use of the Internet. With the advent of the internet we can talk about a new phase, a postmodern age phase or even a post-postmodern one. The social sciences are currently looking for new answers and theoretical approaches that would include new changes in life habits and interpersonal relationships. If we talk about the present time, we could say that the time of the media that have become an integral part of everyday life is a means of communication, entertainment and non-formal education (Ivanović, 2019)

The use of social networks is now one of the needs, that is, imposed needs. Everyday use of these technologies is taken for granted. Young people in Serbia find themselves in a post cultural universe with one part of their being, reason, while they are emotionally enchanted by false images of the past filled with myths and various superstitions (Božilović, 2020). The use of social networks in this way can be purposeful, because through the experiences of others, each individual can acquire new knowledge, develop, learn and improve the quality of all segments of life (Ivanović, 2019). Users of social networks should be able to think critically about media content, evaluate it and only in the end, if necessary, use it. The speed at which modern media are incorporated into everyday life, as well as into the educational system, also contributes to this situation (Ivanović, 2019)

Videos, blogs and posts on Instagram primarily offer tips that cover all aspects of life: health, love, sports, work, etc. (Lipovetski, 2008). Media all the more, because the technology necessary for their production is advanced, favorable and accessible. The content offered in the media is less informative and educational, and is primarily aimed at entertainment. Entertainment brings the biggest profit and unwritten media logic is focused primarily on making the biggest possible profit (Vučetić & Radovanović Šarenac, 2018).

Social networks should be seen as a means of pedagogical development. This is very important, if we start from the fact that in today's dynamic world, education still rigidly adheres to traditional perceptions and changes that have occurred or are occurring are minimal (Ivanović, 2019). Modern digital media in education find various applications: from curricula for learning and exercises, databases and tools, through games for learning and simulation, to complex communication and cooperation environments (Ivanović, 2019). Information accessed through the Internet is organized in a certain way by search engines, even interconnected through links, but this does not mean that it allows users to improve to the level of experts. This information is primarily configured to shape the user, primarily the consumer. Content on the Internet is aimed at promising or offering the greatest possible happiness to anyone who approaches it.

Marshall McLuhan's media are described as sensory and neurological extensions of human consciousness that, in spite of being useful, create dependence (McLuhan, 2002). For dependent users of social networks, hedonism is the basic value orientation in the abundance of content (Vukadinović, 2013). They give their time and attention for the sake of satisfying the illusions that the media offer them, and the media, i.e. the creators of the content on social media, sell their audience to producers (Herman & Chomsky, 1988). Now this is incomparably easier than in the eighties and nineties because for the creators of media content on social networks, ordinary people and their companions are easier to identify and they consciously decide that they "help in generating revenue by being their videos, like and watch the commercials and video to the end. People spend most of their time in virtual space separated from direct communication, which is particularly acute among young people, whose life takes place in the world of hyper production, networking and virtuality (Bazić, 2017).

The discontinuity of consciousness arises in the perception of an individual when, clicking from link to link, they expose themselves randomly or semi-randomly, to information and content from the Internet. Such knowledge or "information" has no clear structure and the individual perceives a wealth of visual, auditory and textual information that does not meet any criteria of relevance or reliability. Chaos in the hierarchy of information and mental activity that is unfocused and does not have constructive and visible results, leads to dissatisfaction and depression (Csikszentmihalyi, 2008).

The Internet and social networks contribute to the rapid spread of various ideas and more efficient operation of various organizations, especially terrorist ones, which causes fear in people (Bazić, 2017).

Lyotard marked the postmodern abandonment of faith in the progress of mankind and the disappearance of the "great narrative", which referred to the development of history in chronological order and implied the continuous well-being of mankind (Lyotard, 1985).

Giddens notes that "the life forms brought by modernity have removed all traditional types of social order in a way that has never been seen before. For the power and breadth of transformation are deeper and greater in the modern age" (Gidens, 1998). He, of course, wrote this in 1998, before the mass use of the Internet. The mass use of social networks has the consequence of even more recent, i.e. newer and newer life forms of social interactions.

These changes affect the personal life and intimacy of social network users. Should we be wary of them? Is it justified to trust social networks? Is the man

of the consumer and information society doomed to a diabolical pact? (Bellini, 1987).

Disruption in the private lives of individuals arises precisely with the abundance and randomness of information that affects the interruptions and discontinuities of consciousness. With the interruption of the chronological thread, there is also the interruption of spatial frames. Thus, an individual's perception of time and space is no longer similar to the perception that our contemporaries had before using the Internet and social networks. Both time and space have undergone a kind of transformation.

Modernity has, therefore, a dark side, but certainly also a side of inconceivable possibilities provided by the speed of information transfer, their availability and exchange. The hypermodernity of the modern information age implies contact with many other users of social networks, who are strangers to each other. The character of communication is transient, and there is really no contact and interaction with complete personalities, who have unique identities within their smaller communities.

As there has been more and more talk lately about the impact of social media on mental health, various questions have been asked − is it even possible to put all social networks in the same category and, if not, what distinguishes them and do they have different effects on the mental health of individuals (Biglbauer & Korajlija, 2020)?

The use of social networks is associated with the degree of loneliness and a sense of belonging in society, life satisfaction and self-esteem. Now their identity is anonymous, changeable or limited to an avatar, i.e. information displayed in an online profile.

The impact of technological changes on the introduction of new teaching content in education is visible in all areas and at all levels of institutional education (Bazić, 2017). The rapid growth in the number of users of social networks is evidenced in the study conducted by the Pew Research Center for the territory of the USA, according to which there are as many as 72% of adult users in the United States (Gardašević, 2021). Social networks have become an integral part of life in the 21st century, especially among young people, as indicated by the fact that there are currently over 3.8 billion users worldwide (Biglbauer & Korajlija, 2020). Every day we witness the increasingly intensive development of modern information technology that affects all segments of human activity and its accelerated and negligible impact on education (Novokmet, 2020). The use of ICT in teaching is becoming more pronounced, and learning through them is already known as M - learning. Tablets enable the use of electronic books, video and

audio educational content from many subjects and thus make them much more interesting and understandable (Bazić, 2017). Namely, Internet users should be able to think critically about media content, evaluating them and only in the end, if necessary, use them. The speed at which modern media are incorporated into everyday life, as well as into the educational system, also contributes to this situation (Ivanović, 2019).

Starting from theoretical settings that should reconcile cognitive, social values, classical and ICT models of learning, the need for individualization and meeting the needs of today's society is pronounced (Vasiljević, 2016).

In the last ten years, social networks have become a digital gathering place for a large number of people. There are four million Facebook accounts in Serbia alone, while Instagram recorded two million users in 2018. The popularity of social networks has made it easy for users to organize and gather around certain interests (Novokmet, 2020). According to a survey by Social Serbia with the support of Huawei Mobile 2020, the most popular social network in Serbia is still Facebook, but the number of users continues to decline slightly from year to year (Social Serbia, 2021).

Realizing the importance of innovation in education, but also society as a whole, developed countries are among the first to create, adopt and develop strategies for innovative education (Vasiljević, 2016). The unification of the education system and the aspiration towards its stronger global regulation is a very corresponding tendency to the Fourth Industrial Revolution, which generates needs for knowledge that is universally and directly applicable in order to accelerate labor mobility and competitiveness in the global market (Bazić, 2017). Recently, dozens of new profiles have been established on Instagram, the goal of which is to explain a rule or popularize a linguistic or literary topic in various ways, primarily in cooperation with images and text, profiles that pay special attention to the quality of visual and thematic contents are, above all, in Serbian (Novokmet, 2020). It is necessary to devise ways to bring the wonderful world of the Internet closer to children and young people. Social networks can be oriented towards the individual as an individual and a social being. It is for these reasons that the American Psychological Association has created principles that support educational reforms around the world, based on the transformation and modernization of learning paradigms in the new ICT environment (Vasiljević, 2016). The results of the research confirm the assumptions about underutilized educational resources of libraries, especially when bearing in mind that most students from the earliest days are directed toward the use of their services, and deviations from expected results occurred in connection with reading electronic and printed books.

With the extreme expansion of social media in recent years, we see that among hundreds of millions of users, some are becoming extremely popular. That is, so popular that they certainly influence the decisions of people active online (Bogićević, 2020). The most influential influencers in Serbia are among the ranks of Twitter users (mostly for political marketing) and Instagramers (the most influential are currently gamers and bloggers). They shape the thoughts of young people with their posts, messages and pictures (Bogićević, 2020). This raises the issue of trust, privacy, as well as the issue of security of Internet users. Through Instagram accounts, everyone who has them can connect with other users of this social network and follow their activities. Advertising on Instagram is becoming increasingly popular in Serbia, because over 1.5 million people sign up for this application every day, over 38% are users aged 18 to 24 and over 34% are users aged 24 to 35 (Vuković, 2020).

Many researchers have realized that the network perspective provides new levers for responding to standard social and behavioral research problems, giving a precise formal definition of aspects of the political, economic or social structural environment (Rakić & Marjanović, 2019). In the last few years, influencers have positioned themselves as potential promoters, creating opinions and shaping consumer attitudes in the most effective and cheapest way, unlike, for example, promotion by celebrities or some other marketing strategies (Bogićević, 2020).

In Serbia, young people are very active on social networks and spend a lot of time contacting friends through social networks and following the content of influencers. Most young people in Serbia follow one or more influencers, while the most represented areas are fashion and cosmetics (Bogićević, 2020).

3. METHODOLOGICAL APPROACH TO THE PROBLEM

As for data processing, for the purpose of the research, we used descriptive statistics and correlation analysis procedures. The variables that are correlated are "favorite social network" and "social network they spend the most time on"; "frequency of the use" and "mood swings"; "addiction" and "jealousy"; "utility" and "education". The scale was reduced in order to examine the extent to which the position on "the use of social networks in education" is congruent with the general position on "the usefulness of social networks".

The research was conducted in 2019. The sample consists of 100 respondents from schools in Belgrade, Niš and Vitina, and it is a pilot research. Students from the first to the fourth grade of the Technical School from Vitina, the Polytechnic − School for New Technologies from Zemun and the Secondary School of Electrical Engineering "Nikola Tesla" Niš were examined.

The aim of the research is to find out whether students recognize the impact that social networks have on their daily lives: whether they access social networks during classes, whether they recognize a change in mood after accessing social networks and whether they believe that social networks have a positive effect on their motivation, learning and whether they use social networks for some kind of education.

The subject of the research is the impact that social networks have on high school students, their quality of life, mood and education.

The data collection instrument is a survey with 15 questions. The data were distributed among the schools in which the research was conducted. Students had the opportunity to leave their opinion or comment at the end of the survey.

The terms the young and youth in the Law on Youth of the Republic of Serbia published in the Official Gazette (ZOM, 50/2011) is defined as follows:

"Youth or young people are people from the age of 15 to the age of 30."

Since the focus of this research is high school students, the terms the young and youth were used in a narrower sense, as a synonym for this target age group. Our conclusions do not apply to those over 18. The paper can serve as a starting point for more general research that would include respondents of other ages who also belong to the category of young people. The paper tries to look at the phenomenon of social networks from the perspective of pedagogues and subject professors, persons responsible for the upbringing and education of those younger than themselves.

Manuel Kastels (Kastres, 2014) provides the following explanation of the term network:

"The network is a set of interconnected hubs. Hubs can have different levels of importance in the network, and therefore in some versions of network theory hubs that are particularly important are called centers." He further states (Kastres, 2014) that networks have: "the ability to introduce new actors and new content into the process of social organizations, with relative autonomy that exists when it comes to centers of power". The social networks that are the subject of our survey are: Instagram, YouTube, Facebook, Twitter and Snapchat. These networks were chosen because students prefer them due to the type of interactions and media that can be shared through them. At first, YouTube certainly functioned as a site for sharing media content, but it soon added benefits for social networking, so now it fully functions as a social network, but has retained the basic feature of a site for sharing video content (Čejko, 2019). Due to this property, it is in the survey.

4. RESEARCH RESULTS

The comment of one of the respondents is striking: "Parents think that YouTube is fooling people, but I do not agree with that and I think that YouTube has educated more people than schools." This indicates a generational conflict, but also a great deal of confidence in the quality and usefulness of the information accessed. Also, the second comment: "It depends which social network is in question. For example, YouTube has nothing to take from you or hide while you post the situation of your life on Instagram and Facebook."

The structure of respondents by gender, year of education and school they attend is shown in *Table 1*.

Table 1. Structure of respondents by gender, year of education and school they attend

Respondent structure	N
Gender of respondents	
Men	57
Female	43
Year of schooling	
First	20
Second	54
Third	11
Fourth	15
Number of respondents per school	
Technical School Vitina − Vrbovac	30
Secondary School of Electrical Engineering "Nikola Tesla" Niš	35
Polytechnic − School for New Technologies, Zemun	35
Total students	**100**

Source: Author's calculation

4.1. Favorite social network students spend most of their time on

The results in *Table 2* indicate that, when it comes to students' favorite social network, Instagram is convincing with 70 students, followed by Facebook with 24 students, while the rest of the students opted for YouTube, Snapchat, Twitter and other social networks. Students spend most of their time on the social network Instagram, which once again confirms the fact that it is their favorite social network, then on Messenger, and least on Twitter, which is not strange, because there is an opinion that Twitter is mostly used for business and political activities.

Table 2. Display of the distribution by categories of the variable "favorite social network" and "social network they spend most of their time on"

Favorite social network		N	The social network they spend most of their time on		
Social network	Instagram	70	Social network	Instagram	74
	Facebook	24		Facebook	16
	YouTube	1		Messenger	3
	Twitter	1		Twitter	5
	Snapshot	1		YouTube	2
	Others	3		Others	0
	Total	100		Total	100

Source: Author's calculation

Relying on technology, daily access to the Internet and having a profile on one of the social networks is a default part of everyday life. The simplicity and good concept of Instagram have made the application develop and spread around the world at the incredible speed (Vuković, 2020).

4.2. Students' attitudes about privacy and data abuse on social networks

What is worrying is the fact that 93 students had some form of abuse on social networks, of which 74 female students, whereas 7 students had a different attitude and it is the students who spend little time on social networks - *Table 3.*

Table 3. Attitudes of students about privacy and misuse of data on social networks

Guaranteed data privacy		N	Abuse on social media		
Yes		57	*Yes*		93
No		43	*No*		7
		Full structure			
	Male	*Female*		*Male*	*Female*
Yes	33	24	*Yes*	19	74
No	20	23	*No*	4	3
Total	100		Total		100

Source: Author's calculation

Guaranteed privacy on the Internet means the right to personal information, storage, use, security from third parties and display of personal information, identification information related to the visitor of a particular social network. The most common form of privacy abuse occurs through the use of other people's

data, false information, downloading and misusing photos and videos. In modern society, often the question arises to what extent the collection and disposal of personal data are allowed and justified. Today, due to the large number of social network users, they are most exposed to this type of data abuse and privacy. Based on the obtained results, we can conclude that females are more exposed to the abuse of privacy on social networks. On the other hand, it is encouraging that 72 students think that social networks are a useful thing in their education, growing up and education.

4.3. Students' attitudes about the usefulness of social networks and their use in education

Social networks were confirmed by 72 students, while 28 students had the opposite attitude, so the first research hypothesis *(H1)* was confirmed. The following table shows students in terms of usefulness and the use of social networks in education and training. - *Table 4*.

Table 4. Display of the difference in the level of expression of the positive attitude of students towards the usefulness and the use of social networks in education

Student attitude	N
The usefulness of social networks	
Yes	72
No	28
Motivation to learn after using social networks	
Yes	8
No	92
The use of social networks for educational purposes (as an aid to the adoption of school materials, follow influencers in the field of education, use Youtube to learn new skills, etc.)	
Yes	89
No	11
Access to social networks during classes and classes	
Yes	70
No	30
Total students	100

Source: Author's calculation

Exactly 72 students have confidence in the usefulness of social networks, although a significantly smaller percentage is convinced that they are guaranteed privacy on social networks. However, 92 students are not motivated to learn

after accessing social networks, while for 8 students this attitude is less important, which can be related to previous questions and answers of students created in this research, when it comes to the use of social networks. Furthermore, 30 surveyed students do not access social networks during school hours, while 70 students use phones in class, which is an alarming figure for teachers and worrying if we consider various possibilities of manipulation, except in the case of permission by teachers or the use for learning. It is also encouraging that 89 students use social networks for educational purposes to help them adopt school materials, follow influencers in the field of education, use Youtube to learn new skills, etc. In order to examine the extent to which the attitude towards the use of social networks in education is congruent with the general attitude about the usefulness of social networks, the attitude item about education was recorded so that one indicates a negative attitude (has a lower "intensity") and a two a positive attitude "intensity"), and then correlation analysis was applied and it was obtained that there is a statistically significant low, positive correlation between the general attitude towards the use of social networks and the attitude about online education and training ($\rho = 0.14$, $p = 0.01$). Thus, students who have a positive general attitude towards the usefulness of social networks, also have a negative attitude towards the use of social networks in education and training. From this we can conclude that most of the mental energy is spent during the stay on social networks, that students are exhausted after using social networks and that they do not find motivation on social networks, ie. "constructive incentive to learn" (Vučić, 1991).

4.4. Students' attitudes about mood swings, the frequency of the use, addiction or jealousy with access to social networks

Social networks undoubtedly affect us, as we do not seem to be moving in the direction of reducing the use of technology and related social networks, so in the long run it is important to learn how to function in a technology-mediated world in a way that benefits our mental health (Biglbauer & Korajlija, 2020). There are a large number of social networks on the Internet and they represent an increasingly important space for communication, cooperation and exchange of ideas (Bazić, 2017). They represent a great challenge to education because they are very close to pupils and students so they form an integral part of their lives, they are the media through which information spreads quickly, like-minded people gather around them, various ideas are promoted and changes are encouraged (Bazić, 2017).

A large number of students are aware of the change in mood affected by their stay on social networks, and yet 83 stated that they cannot not access social networks at least once a day, so based on this attitude it can be concluded that hypothesis *(H3)* has been confirmed. Social networks often lead to the change of mood, way of thinking and desire to become something that in reality we do not want so much. In this respect, 96 respondents rounded up the affirmative answer when it comes to their mood before and after the time spent on social networks, whether it was depression, empathy or joy, and the research hypothesis *(H2)* was confirmed. Also, more than half of the respondents feel nervous when they are not able to access social networks. Nervousness or discomfort if they are not able to access social networks is always felt by 25 students, sometimes by 64 students and never 11 by students.

Table 5. The difference in the level of frequency of the use and mood swings

Students' attitudes	N
Could you spend a day without using social media?	
Yes	17
No	83
Does it happen that after the time spent on social networks your mood changes?	
Yes	96
No	4
Do you feel nervous or uncomfortable when you are not able to access a social network?	
Yes, sometimes.	64
Yes, always.	25
No, I never feel that way.	11
Total students	100

Source: Author's calculation

Among the negative emotions, there is jealousy, with the largest percentage of students claiming that they sometimes felt jealous because of the post they see on the social network (64 students), but also the vast majority, almost the same percentage of students, publish statuses that provoke this feeling in their companion (97 students). In addition, 21 students feel jealous because of someone's post on social networks, while 15 students never feel jealous, and they are students who are less active on social networks or who are active on a social network that is less popular with the younger generations.

Table 6. Students' attitudes about addiction and jealousy

Students' attitudes	N
Have you ever felt jealous because of someone's post on a social media?	
Yes.	21
Yes, but sometimes.	64
Never.	15
Have you ever posted something to provoke envy or jealousy in a friend or a companion?	
Yes	97
No	3
Total students	100

Source: Author's calculation

Out of 100 surveyed students, only 3 surveyed students did not have posts on social networks with the aim of causing envy or jealousy among their friends, which is also a worrying fact. Young people, under the influence of social networks and the environment, often present themselves differently from real life, in order to gather likes, views or audience.

5. CONCLUSION

The impacts that social networks have on the quality of life of high school students can be viewed as constructive (advantages) and include: easy and fast communication, availability of information that will benefit the further education of students and achieving long-term life goals. Influences that disrupt the quality of student life, negatively affecting their mood and feelings, zeal for learning, and long-term success in school and life, are what we have identified in this paper as shortcomings.

There is a need to raise awareness among young people regarding the digitalization of education and the application of ICT. Electronic media provide the ability to quickly gain knowledge. The knowledge acquired in a traditional school should be replaced by the development of information retrieval skills using existing technologies and their conversion into information that students understand and know how to apply. Digitization of education is a very responsible social and economic task.

The term postmodern, introduced by Jean-François Lyotard, in an effort to name the non-historical period in which humanity finds itself, with the use of the Inter-

net, can be further developed to follow technological progress and correspond to the most modern state of society, i.e. societies.

In the newly formed phase, there is a certain disorientation of a person. It is primarily conditioned by the discontinuity of consciousness and the randomness of information. These two concepts, together, go hand in hand. In contrast to formal education, which is realized in certain institutions, through pre-planned and organized curricula, which include gradual acquisition and mastery of knowledge, where between the phases there is a conditionality − the transition to the next phase of learning and education is impossible without mastering the previous phase of random information scattered across the internet.

The fact that a large part of their time, as well as the time spent at school, young people spend on social networks, testifies to the fact that young people do not know how to use their time well and productively, and that they are not overly focused on planning for the future. It is up to parents and teachers to point out to them that life can have a better structure, and thus greater quality and satisfaction. Adolescent egocentrism and mistrust towards the generation of parents and teachers can be a challenge and an obstacle for both parents and teachers, since adolescents at this developmental stage notice a discrepancy between the ideal and the real, and this is a frequent source of dissatisfaction and rebellion directed at the elderly.

This research fills a gap in the literature regarding the usefulness and disadvantages of social networks for the younger generations in Serbia. The research was conducted in 2019. Since then social networks have gained additional importance as support in conducting online classes, as well as remote communication.

Recommendations for future research are to include a larger sample and impact which networks have on online teaching. Future research should include primary school students, both because of the growing representation of students on social networks, and because of the usage of social networks for teaching.

ACKNOWLEDGMENTS

The article is the result of research conducted in the summer semester of 2019 in the secondary schools: Technical School Vitina−Vrbovac, Secondary School of Electrical Engineering “Nikola Tesla” Niš and Polytechnic − School for New Technologies in Zemun, Belgrade. The research and results were presented in a customized format in the Radio Belgrade show “Perspective 202” in September 2019, as well as at the Tesla Global Forum in Novi Sad in 2020.

REFERENCES

Allcott, H., Braghieri, L., Eichmeyer, S. & Gentzkow, M. (2020). The Welfare Effects of Social Media. *American Economic Review, 110(3)*, 629-676.

Bazić, J. (2017). Trendovi promena u društvu i obrazovanju koje generiše Četvrta industrijska revolucija. *Sociološki pregled 51(4)*, 526-546.

Bellini, J. (1987). *High Tech Holocaust.* London, UK: A Graham Tarrant Book.

Biglbauer, S., & Korajlija, L. A. (2020). Social Connections, Depression and Anxiety. *Socijalna psihijatrija, 48 (4)*, 404-425.

Bogićević, J. (2020). Uticaj influensera na formiranje kupovnih navika tinejdžera. *Zbornik radova Fakulteta tehničkih nauka*, 1-4.

Bokan, J. (2020). Da li mreže grade ili razgrađuju? *Zbornik Matice srpske za društvene nauke 173(1)*, 122-125.

Božilović, N. (2020). Antinomije kulture savremenog srpskog društva: predmoderni mentalitet vs. postmoderni identitet. *Sinteze - časopis za pedagoške nauke, kwiževnosti i kulturu (17)*, 65-82.

Csikszentmihalyi, M. (2008). *Flow: The Psihology of Optimal Ehperience.* New York, USA: HarperCollins Publishers.

Čejko, M. (2019). *Superpovezani.* Beograd, Srbija: Klio.

Gardašević, J., Brkanlić, S., Brkić, I., Prodanović, R., & Kovačević, M. (2021). Kompleksnost podele korisnika društvenih mreža. *XXVII Skup Trendovi razvoja: On--line nastava na univerzitetima* (pp. 1-3). Novi Sad, Srbija: Fakultet tehničkih nauka.

Gidens, E. (1998). *Posledice modernosti.* Beograd, Srbija: Filip Višnjić.

Herman, E. S., & Chomsky, N. (1988). *Manifacturing Consent: The Political Economy of the Mass Media.* New York, USA: Pantheon.

Ivanović, M. (2019). Savremeni mediji u nastavi muzike - didaktičke specifičnosti i potencijali. *Zbornik radova Pedagoški fakultet u Užicu*, 227-242.

Kastres, M. (2014). *Moć komunikacija.* Beograd, Srbija: Klio.

Lipoveski, Ž. (2008). *Paradoksalna sreća.* Sremski Karlovci, Srbija: Izdavačka knjižarnica Zorana Stojanovića.

Lyotard, J. F. (1985). *The Postmodern Condition: A Report on Knowledge.* Minneapolis, USA: University of Minnesota Press.

McLuhan, M. (2002). *Razumijevanje medija: mediji kao čovekovi produžeci.* Zagreb, Hrvatska: Golden marketing - Tehnička knjiga.

Novokmet, S. (2020). Kako nam internet može pomoći u nastavi srpskog jezika i književnosti? *Književnost i jezik 157(1)*.

Rakić, S., & Marjanović, U. (2019). Uticaj upotrebe digitalnih obrazovnih resursa na učinak studenata. *Zbornik radova Fakulteta tehničkih nauka, Novi Sad*, 1-4.

Sakya, H. B., & Nicholas, A. C. (2017). Association of Facebook Use with Compromised Well-Being: A Longitudinal Study. *American Journal of Epidemiology 185(3)*, 203-211.

Serbia, S. (2021, april 28). *Social Serbia.* Retrieved from Pioniri: https://pioniri.com/sr/socialserbia2020.com

Twerge, J. M. (2017). iGen: *Why Today`s Super-Connected Kids Are Growing Up Less Rebelious, More Tolerant, Less Happy-and Completely Unprepared for Adulthood.* New York, USA: Simon & Schuster.

Vasiljević, D. (2016). Društvene mreže u obrazovanju: stavovi i očekivanja studenata. *Teme 40(4)*, 1241-1258.

Vučetić, V., & Radovanović Šarenac, D. (2018). Izazovi medijatizacije društva. *Hum 13 (19) Mostar: Filozofski fakultet*, 134-155.

Vučić, L. (1991). *Pedagoška psihologija učenja.* Beograd: Centar za primenjenu psihologiju Društva psihologa Srbije.

Vukadinović, M. (2013). *Zvezde supermarket kulture.* Beograd: Klio.

Vuković, M. (2020). Instagram, jedan od uzorka invazije engleskih rečiu upotrebi srpskog jezika kod mladih. *Baština, Priština Leposavić (50)*, 73-90.

ZOM, Z. o. (50/2011). *Zakon o mladima.* Beograd, Srbija: Službeni glasnik RS.

АНАЛИЗА УТИЦАЈА ДРУШТВЕНИХ МРЕЖА НА КВАЛИТЕТ ЖИВОТА И ОБРАЗОВАЊА МЛАДИХ

1 Јелена Јевтић, Политехника – школа за нове технологије, Београд, Србија
2 Милан С. Дајић, Техничка школа Витина, Врбовац, Србија

САЖЕТАК

Друштвене мреже јесу начин да се креира виртуелни идентитет и ступи у односе са непознатим људима, тј. странцима у низ интеракција које нису биле познате човјеку прије постојања интернета. Мобилни телефони и виртуелни свијет често креирају личност онакву каква она није у стварном свету. Може се рећи да је технологија измијенила ток човјечанства и људске свијести и допринијела многим измјенама у менталитету друштва, нарочито код омладине. Дјеца неријетко бивају обузета материјализмом и љубомором, што их даље подстиче да постану једна несвјесна, неморална и неамбициозна популација. Један од негативних утицаја друштвених мрежа јесте злоупотребе приватности, што, такође, постаје растући проблем свугдје у свијету и не треба га занемарити. Међутим, ипак треба задржати и позитиван став када су у питању друштвене мреже, јер олакшавају комуникацију, приступ информацијама и учењу, већа је доступност услуга, бесплатно оглашавање неких производа или услуга. Средњошколци свакодневно интензивно користе интернет, а рад покреће питање да ли га користе конструктивно или деструктивно. Истраживање је спроведено у 2019. години, посматрана је популација средњошколаца, а обухваћено је 100 ученика на територији Београда, Ниша и Витине.

Кључне ријечи: *друштвене мреже, Инстаграм, Јутјуб, млади.*

AUTHORS' GUIDELINES

PAPER TITLE – USE CAPITAL LETTERS, CENTER, BOLD, TIMES NEW ROMAN, SIZE 16

1 Corresponding Author Affiliation (10pt regular, center align)
2 First Co-Author Affiliation (if different from Author Affiliation) (10pt regular, center align)
3 Second Co-Author Affiliation (if different from upper affiliations) (10pt regular, center align)
*Corresponding author E-mail: (10pt regular, center align)
1 ORCID ID:
2 ORCID ID:
3 ORCID ID:

ARTICLE INFO

Original scientific Article
Received: xx.xx.2021.
Revised: xx.xx.2021.
Accepted: xx.xx.2021.
doi:
UDK
xxx

Keywords:

should include 4-10 key words that summarize the contents of the paper /Times New Roman, Italic, 10/

JEL Classification:

ABSTRACT

The abstract should contain a maximum of 250 words. The abstracts should avoid any abbreviations and mathematical formulas.

The abstract is a summarization of the full report, written in one paragraph, and should include next elements:

1. Purpose
2. Methodology
3. Results
4. Conclusions
5. Recommendations
6. Additional data

/Times New Roman, 10/

1. INTRODUCTION

Use A4 paper, Portrait, margins Left/Right 2,5 cm, Top 2,5 cm, Bottom 2,5 cm, Header/Footer 1.5 cm. Alignment Justify, Line Spacing Single, Paragraph Before 6 pt, After6 pt, Indentation Right/Left 0 pt. Paper should not be longer than 16 pages. It should be sent using a button “Make a Submission” on Journal’s website: www.ae.ef.unibl.org.

Introduction is the first section of an IMRAD paper. Its purpose is to state clearly the investigated problem and provide the reader with relevant background in-

formation. It states the objectives of the work and provides an adequate background, avoiding a detailed literature survey or a summary of the results.

The purpose of the Introduction should be to supply sufficient background information to enable the reader to understand and evaluate the results of the present study without the need to refer to previous publications on the topic. Introduction should be written mostly in the present tense. /Times New Roman, 12/

2. MATERIALS AND METHODS

Materials and methods are the second section of an IMRAD paper. Its purpose is to describe the experiment in such detail that a competent colleague could repeat the experiment and obtain some or equivalent results. It should provide enough details to allow the work to be reproduced. Already published methods should be indicated with a reference: only relevant modifications should be de-scribed.

3. RESULTS

Results are the third section of an IMRAD paper. Its purpose is to present new information gained in the study. It should be clear and concise. Results are the core of the paper. The Results section shouldn`t start with describing methods that were inadvertently omitted from the Materials and Methods section. Results must be written in the past tense.

4. DISCUSSIONS

The final section of an IMRAD paper. Its purpose is to fit the results from the current study into the preexisting fabric of knowledge. The important points will be expressed as conclusions. This should explore the significance of the results, not repeat them. A combined *Results and Discussion* section is often appropriate. Avoid extensive citations and discussion of published literature.

Many papers are rejected by journal editors because of a poorly written Discussion section.

5. CONCLUSIONS

The main conclusions of the study may be presented in a short Conclusions section, which may be a separate section or form a subsection of a *Discussion or Results and Discussion* section. Conclusions should provide a summary of important findings and their implications for the area of research.

ACKNOWLEDGEMENTS

Collate acknowledgements in a separate section at the end of the article before the references and do not place them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g. help with language, writing assistance or proof reading, etc.). It should be brief.

Conflict of interests

The authors declare there is no conflict of interest.

REFERENCES

All manuscripts should be formatted using the American Psychological Association (APA) citation style. For additional examples, consult the most recent edition of the Publication Manual of the American Psychological Association.

Reference list should only include works that have been published or accepted for publication. Unpublished works should be only mentioned in the text. Reference list should contain the biblio-graphic details of the cited books, book chapters, or journal articles.

Reference list entries should be alphabetized by the last name of the first author of each work in the format hanging, Times New Roman, 10.

Citation of Books

Author's surname Initial(s) of the given name(s). (Year of Publication) *Title of Book*, Volume num-ber (if relevant), edition (if relevant). Publisher, Place of Publication

Citation of Articles

Author's surname Initial(s) of the given name(s). (Year of publication) Title of article. *Journal Volume number* (and issue number if issues within a volume number are not consecutively paginated): Number of the first and last page of an article

Citation of Websites

Author's surname Initial(s) of the given name(s). (if known) title, type of document (if relevant), date of issue (if available), web address and date of access, if the document or the website may be sub-ject to change.

Example:

Books:

Northouse, P. G. (2016). *Leadership - Theory and Practice*. London, UK: Sage Publication.

Book Chapters:

McKenzie, H., Boughton, M., Hayes, L., & Forsyth, S. (2008). Explaining the complexities and value of nursing practice and knowledge. In I. Morley & M. Crouch (Eds.), *Knowledge as value: Illumination through critical prisms* (pp. 209-224). Amsterdam, Netherlands: Rodopi.

Journal Papers:

McCormick, J. & Barnett, K. (2011). Teacher's atribution for stress and their relationship with burnout. *International Journal of Educational Management, 25*(3), 278-293.

Cheung, J. M. Y., Bartlett, D. J., Armour, C. L., Laba, T. L., & Saini, B. (2018). To drug or not to drug: A qualitative study of patients' decision-making processes for managing insomnia. *Behavioral Sleep Medicine, 16*(1), 1-26. doi:10.1080/15402002.2016.1163702

Conference Papers:

Porter, M., Omar, M., Campus, C., & Edinburgh, S. (2008, January). *Marketing to the bottom of the pyramid: Opportunities in emerging markets*. Paper presented at the 7th International Congress Marketing Trends, Venice, Italy. Retrieved from http://www.escp-eap.eu/conferences/marketing/2008_cp/Maktoba.pdf

Herculano-Houzel, S., Collins, C. E., Wong, P., Kaas, J. H. & Lent, R. (2008). The basic nonuniformity of the cerebral cortex. *Proceedings of the National Academy of Sciences*, 105, 12593–12598. doi: 10.1073/pnas.0805417105

Presentations not Formally Published:

Muellbauer, J. (2007, September). Housing, credit, and consumer expenditure. In S. C. Ludvigson (Chair), Housing and consumer behaviour. Symposium conducted at the meeting of the Federal Reserve Bank of Kansas City, Jackson Hole, WY.

Newspaper Article:

Fellner, C. (2019, April 7). Time bomb: Two new cases as NSW faces worst measles outbreak in years. *The Sydney Morning Herald*. Retrieved from https://www.smh.com.au

Government Publications:

Australian Institute of Health and Welfare. (2018). *Physical activity across the life stages*. Canberra, Australia: Author.

Australian Institute of Health and Welfare. (2018). *Physical activity across the life stages*. Retrieved from https://www.aihw.gov.au/reports/physical-activity/physical-activity-across-the-life-stages/contents/table-of-contents

Company and Industry Report

EFW (2010). *Economic Freedom of the World: 2010 Annual Report*. Vancouver, Canada: Fraser Institute

Vuong, B. (2018, November). *IBISWorld industry report OD5381. Coffee shops in Australia*. Retrieved from IBISWorld database.

Webpage with an Author:

HealthTimes. (2015). The future of aged care nursing in Australia. Retrieved from https://healthtimes.com.au/hub/aged-care/2/news/nc1/the-future-of-aged-care-nursing-in-australia/495/

Webpage with no Author:

$250m funding boost for malaria vaccine. (2003). Retrieved from https://www.abc.net.au/news/2003-09-22/250m-funding-boost-for-malaria-vaccine/1482220

SciIndeks. (n.d.). Retrieved from: https://scindeks-clanci.ceon.rs/data/pdf/0353-443X/2011/0353-443X1102089P.pdf

TABLES

All tables are to be numbered using Arabic numerals.

Tables should always be cited in the text in consecutive numerical order.

For each table, please supply a table caption (title) explaining the components of the table.

Identify any previously published material by giving the original source in the form of a reference at the end of the table caption.

Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included bellow the table.

For the best quality final product, it is highly recommended that you submit all of your artwork – photographs, line drawings, etc. – in an electronic format.

Example:

Table 1. Comparison of characteristic values obtained by PCA and threshold values obtained by the parallel analysis

Serial number of components	The actual characteristic values of PCA	Values obtained by parallel analysis	Decision
1	5,716	1.5595	Accept
2	1,913	1.4326	Accept
3	1,107	1.3287	Reject
4	0,967	1.2433	Reject

Source: Author's calculation

PAPER TITLE – IN ANOTHER LANGUAGE, SIZE 16

1 Corresponding Author Affiliation (10pt regular, center align)
2 First Co-Author Affiliation (if different from Author Affiliation) (10pt regular, center align)
3 Second Co-Author Affiliation (if different from upper affiliations) (10pt regular, center align)

SUMMARY

If a paper is written in Serbian, an abstract is translated into English and given in an extended form as a summary. Also, paper title and affiliation are given in English. If a paper is written in English, an abstract is given in Serbian in extended form. Also, paper title and affiliation are given in Serbian.

Summary is an informative overview of an article with no more than 500 words. It is given at the end of the paper, after the section *References*. Summary includes research methodology with emphasis on methods and techniques of research, results and scientific contribution of the paper.

Abstract in extended form, the so-called summary, is given at the end of the paper, after the section *References*. If a paper is written in a foreign language, a summary should be in Serbian, and if a paper is in Serbian language, a summary should be written in English language. Exceptionally, it can be written into some other language widespread in a given scientific discipline. For a summary in a foreign language, the author must provide grammatical and spelling accuracy. Summary length can be up to 1/10 paper length.

Keywords:
should include 4-10 key words that summarize the contents of the paper /Times New Roman, Italic, 10/