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ORIGIN AND DEFINITION OF REGTECH

Miroslav Nedelchev[1]

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Abstract

The aim of the paper is to lift the veil of new banking regulation framework. By a bibliometric analysis, we draw conclusions for definition and description of modern regulation techniques. The costs and benefits of RegTech are derived.

The results of the article conclude existence of umbrella of definitions for RegTech. Competent authorities and international organisations introduced the core definitions. Banking regulation is adapting to the New reality through RegTech.

Keywords: *banking regulation, bibliometric analysis, costs and benefits, SSRN*
JEL Codes: *E58, G28, L51*

Introduction

The public interest to measures after the onset of global financial crisis, does not meet to the quantity of articles for technological changes in banking regulation. The alignment of society's views on the transfer of financial burden on taxpayers and the need of a new regulation framework does not lead to a coincidence of authors' views regarding essence of regulation techniques (RegTech). Like other topical issues, such as cybersecurity and eco trends, RegTech has a complex origin – new financial services (FinTech) and new regulatory framework.

Definition for RegTech

Although the term RegTech carries a "beautiful vision", it not has a commonly accepted definition (Yang and Tsang, 2018). We will try to pool definitions for RegTech.

In carrying out an analysis of the diversity of RegTech definitions, we used the SSRN database and identified 15 articles that contain "RegTech" in their headlines for period 2015–2019. Unlike another similar term, FinTech, RegTech is less commonly used in the headlines and more commonly used in keywords to the article, which can be

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explained by its newer origins and closer application, as well as the recommendations of reviewers and publisher requirements (Filipova, 2010).

The carried out bibliometric analysis determines a limited use of introduced definitions in one third of the articles. In 10 out of 15 articles were used definitions introduced by authors themselves. The most commonly used definitions are introduces by Financial Conduct Authority (London)[1] (in three articles), while three articles use more than one definition – by Financial Conduct Authority (London), Banco Bilbao Vizcaya Argentaria (Madrid)[2] and Delloite[3]; by Financial Conduct Authority (London), World Bank (Washington, D.C.)[4] and Bank for International Settlements (Basel)[5]; by Financial Conduct Authority (London), UK Government Chief Scientific Adviser (London)[6] and Financial Stability Board (Basel)[7]. There is one article using the definition by Investopedia[8].

The origin of RegTech is initially linked to the new regulation framework due to the global financial crisis, i.e. after 2008 (Madgerova and Kyurova, 2014). The authors' definitions point to another beginning point – from the 1960s with the introduction of traveler checks and later with the introduction of ATMs (Nedelcheva, 2017). In financial history, the largest user of automated models are rating agencies (Tsvetanova, 2014).

The new element in RegTech is the use of IT for compliance with laws and regulation requirements (Yuleva, 2019). The application of IT as a tool in relationships between banks and banking regulators is due to new IT fields such as analysis techniques for large data and artificial intelligence (Stoimenova, Kirilov and Zaykova, 2019). The use of IT in regulating is a step forward in the interactive evolution of finance and

[1] RegTech is a sub-set of FinTech that focuses on technologies that may facilitate the delivery of regulatory requirements more efficiently and effectively than existing capabilities (Financial Conduct Authority, 2016).

[2] RegTech is the automation of manual processes and the links between steps in analytical/reporting processes (BBVA, 2016).

[3] In the short term, RegTech will help firms to automate the more mundane compliance tasks and reduce operational risks associated with meeting compliance and reporting obligations (Deloitte, 2016).

[4] RegTech is technology used in the context of regulatory monitoring, reporting and compliance to benefit the finance industry. RegTech companies aim on finding solutions that address regulatory compliance challenges through technological innovation. (World Bank, 2017).

[5] RegTech to be innovative technologies that can help financial institutions comply with regulatory requirements and pursue regulatory objectives (Bank for International Settlements, 2017).

[6] RegTech is technologies that can be applied to in regulation, typically to improve efficiency and transparency in regulatory systems (UK Government Chief Scientific Advisers, 2015).

[7] RegTech is any range of applications of FinTech for regulatory and compliance requirements and reporting by regulated financial institutions (Financial Stability Board, 2017).

[8] RegTech is the management of regulatory processes within the financial industry through technology. The main functions of RegTech include regulatory monitoring, reporting, and compliance (Investopedia, 2020).

information technology (Filipova and Yuleva, 2018). The biggest change is made in banking regulators to follow new developments in the banking sector and, above all, in offering new services and tools (Filipova and Nedelcheva, 2020). The digital transformation of the competent authorities can be seen as a synonym for RegTech (Stankovska, Dimitrieska and Stamevska, 2018).

Features of articles for RegTech definition

– the first article for RegTech from 2015 uses the author's own definition, and from 2016, definitions by organizations begin to be used;

– most definitions of RegTech are from 2015 and are most commonly cited;

– definitions for RegTech are used in articles by more than one author;

– articles for RegTech have high volume – over 30 pages;

– the dynamics are in the nouns of the individual authors for defining RegTech

– definitions for RegTech are applied to investment banks only;

– in defining RegTech, some authors discuss reducing costs, others – for reducing information asymmetry;

– the authors' views on the nature of RegTech remain at national or regional level in line to regulation requirements;

– there are no definitions by auditors and rating agencies, as well as by competent authorities.

Lifting the veil of RegTech

Reasons for origin of RegTech

– Ever-increasing regulatory change: compliance officers express regulatory fatigue and overload in the face of snowballing regulations (English Hammond, 2015).

– Regulatory matters are consuming disproportionate amounts of board time, from correcting non-compliance and preventing further sanctions to implementing structural changes to meet new rules (English Hammond, 2015).

– Banks globally have paid USD 321 billion in fines since 2008 for an abundance of regulatory failings from money laundering to market manipulation and terrorist financing (Finch, 2017).

– The cost of managing the regulatory environment is more than 10% of all operational spending of major banks, i.e. around USD 270 billion per year (Citigroup, 2017).

– 61 percent of a compliance officer's time is spent on "other compliance tasks" such as management of regulatory implementation projects (Thomson Reuters, 2016).

Reasons for applying of RegTech

– Financial innovations are invading the "complex and arcane world" of regulatory compliance (Roberts, 2016).

– Skills shortages with regard to regulatory and compliance staff, particularly software, analytics and regulatory/compliance "talent" (UK Government Chief Scientific Adviser, 2015).

– The pendulum needs to begin to swing back at least in part towards the business itself to allow for business improvement and development rather than having all change capacity and capability taken up by regulatory issues (Hammond, 2016).

– Operating costs spent on compliance increased by over 60% for retail and corporate banks compared to pre-crisis spending levels (Deloitte, 2017).

Description of RegTech

RegTech's innovativeness as well as the large number of expectations of accrued problems can explain the variety of its description:

– an answers to the risks and challenges existing in the financial industry;

– an application of new technologies for regulatory compliance;

– an aspect of fundamental changes;

– a further step in the interactive evolution of finance and information technology;

– a game-changer, given the revolutionary nature of current IT developments;

– a great opportunity for regulation authorities;

– a means to deploy current and emerging technology solutions to reduce the increasing costs of compliance for companies and to improve internal reporting and supervisory capacity for regulators;

– a new approach at the nexus of data, digital identity, and regulation;

– a new concept in financial risk management;

– a response to the huge costs of complying with new institutional demands by regulators and policy makers;

– a sequenced reform that could benefit regulators, industry, and entrepreneurs in the financial sector and other industries;

– a technological solution to facilitate compliance with and monitoring of regulatory requirements;

– a tool that enables companies to automate ordinary compliance tasks.

Benefits of RegTech

Regardless of the material nature of RegTech, most definitions point to expectations for intangible benefits, which are difficult to evaluate:

Financial benefits:

– to decreases claims for damages;
– to frees a capital for more productive uses;
– to offers massive cost savings.

Non-financial benefits:

– to allows integration of big data into an improved compliance process;
– to better access (and assess) data, as well as constantly allowing its reorganization;
– to decreases the overall amount of manual paperwork;
– to enhances internal reporting processes;
– to ensures that banks are up to date with the latest regulatory changes;
– to facilitates compliance with and monitoring of regulatory requirements;
– to helps not only in the set-up, but also in the governance and regulation of a credit register;
– to implements regulations;
– to improves regulatory processes and related compliance;
– to improves quality and efficiency of regulation;
– to improves quality of the service for the client;
– to increases competition by removing a barrier to entry;
– to increases efficiency;
– to increases market integrity;
– to promotes good corporate practices;
– to reduces information asymmetries across business units and provide those in the organization performing data mining and analytics with accurate and reliable data that can be leveraged to correctly automate many operational decisions;
– to reduces risk in the system;
– to reduces risk of administrative or criminal sanctions;
– to reduces risk of human errors;
– to reduces the chances that criminals abuse the financial system for money laundering purposes;
– to reduces the need for human intervention in ensuring compliance with the law.

RegTech vs FinTech

International organizations defined RegTech as a subcategory of FinTech. A frequently used explanation for such an assertion is the dynamics of the two categories in three stages of historical development.

There are number of authors who define RegTech as separate phenomenon:

– FinTech describes the evolution of banks while RegTech – the revolutionary adaptation of banking relationships to the new reality. FinTech's dynamics can describe the emergence of crisis conditions by offering new financial services while RegTech – banking measures to reduce risk of regulation fines and court cases.

– Another difference are driving forces for development (Nedeltchev, 2002). FinTech's rapid growth is driven by a number of startups and outsourced IT firms outside the scope of regulation. The reported organic growth of FinTech's application can be explained by institutional demand to preserve competitiveness by offering new financial services. At the other extreme is RegTech, which arises due to regulation requirements and increased compliance costs, i.e. top-down (Institute of International Finance, 2015) and outside-inwards. The directions for RegTech's emergence result in resistance in its application and changes in organizational structures.

– FinTech has universal applicability and is of global nature. In contrast, RegTech has the potential to be applied in a limited number of countries and regions. Our point of view is most relevant to global banking groups and can explain their great interest in RegTech.

– The dynamics of RegTech is reflected in new fields. For example, the introduction of technology solutions for regulators (RegTech2) and supervisors (SupTech). The explanation for this dynamics is the adaptation of the competent authorities to digitization and globalization of banking as well as a response to the public interest and stakeholders for a sustainable economic growth.

– FinTech is focused on business processes for offering new services and generating profits. Each bank is unique in these processes, given the available resources and their efficient use. While with the other phenomenon, RegTech, the processes are focused on relationships with competent authorities to reduce the risk of sanctions and the imposition of fines. Individual banks have similar interest when implementing RegTech, given the convergence of national legislations for a stable banking system.

Ever since its origin, the term „RegTech" has been defined as a subcategory of FinTech, which fact largely determines the diversity and dynamics of their definitions. While for FinTech the definitions are relatively similar and there is a consensus about the time of occurrence and the scope of its application, the definitions for RegTech are determine by a number of factors (nationality; profession; number of authors):

– The nationality of the authors, as well as the journals, greatly influences the definitions. In countries where competent authorities have ruled on the nature of RegTech, a low level of diversity is laid down, as in most cases, the authority's definition is quoted letter by letter which reduces the contribution of the particular author.

– The professional affiliation of the authors also leads to a variety of definitions for RegTech. Lawyers have interest to the origin of the term „RegTech" given their point of view for a dynamics only in regulation policy, but not in the financial system. According to their view, RegTech is more in the competence of regulators than financial

intermediaries are. Another part of the authors, the financiers, separated RegTech as a new phenomenon or subcategory of FinTech. These views exist more frequently in recent articles. According to these authors, RegTech's subordination to FinTech reduces the potential of regulation relationships and transform it to a tool of efficiency where is lost the evolution of the financial system and the lessons from the global financial crisis. It is common practice for financiers to use the definitions of bank entities leading in the research fields – for example, the Banco Bilbao Vizcaya Argentaria, Madrid and the Financial Stability Board. The third group of definitions depending on the profession is that of business administration experts. Each author has his own definition for RegTech and the variety is highest. Their definitions should be considered depending on the organizational structure of the banking group and the status of the author. The views gravitate around definition of Investopedia.

– The number of authors has an impact on RegTech's definitions. In articles with more than one author is quoted a definition which has been imposed by previous authors or development periods. In most cases, these are definitions by international organizations. While in articles by one author, the definitions are individual and create discussions in the scientific fields.

Conclusion

Perhaps the term "RegTech" is new, but RegTech systems have existed for years. Analyzes for the full scope of RegTech definitions have failed due to its dimensions. The nexus of interests is reflect in an umbrella of definitions. In the analysis of the definitions, it was found that the basis for introducing RegTech – stability of the banking system, remains in the background.

We define RegTech as a new generation of relationship banks-banking regulation. In order to continue financial innovations, regulation should be adapted as a mirror image of banking services. The new relationship is a form of freedom of movement – data from the periphery to the center, i.e. the responsibilities between the home country and host country are balanced. We can assume that the new relationship is the homepage of Basel 4. Adopting the idea of the new relationship will show whether the regulation authorities are ready for the New Reality.

REFERENCES

Arner, D., Barberis, J. and Buckley, R. (2017). FinTech, RegTech, and the reconceptualization of financial regulation. *Northwestern Journal of International Law & Business*, 37 (3), 371–413.

Bank for International Settlements. (2017). *Some practices: implications of FinTech developments for banks and bank supervisors.* Basel.

BBVA. (2016). RegTech, the new magic word in FinTech. Banking Outlook (pp. 4–5) March, Madrid.

Citigroup. (2017). *Digital disruption – revisited. What FinTech VC investments tell us about a changing industry*? Citigroup Global Markets Inc.

Deloitte. (2015). *RegTech is the new FinTech: How agile regulatory technology is helping firms better understand and manage their risks.*

Deloitte. (2017). *The Future of regulatory productivity, powered by RegTech*.

English, S. and Hammond, S. (2015). *Cost of compliance*. Thomson Reuters.

Filipova, M. (2010). Decision making system. *Economics and Management*, VI (4), 25–32.

Filipova, M. and Nedelcheva, Y. (2020). Competitiveness in pharmaceutical industry: participants in supply side and demand side. *Revista Inclusiones*, forthcoming

Filipova, M. and Yuleva, R. (2018). Innovative management as competitiveness factor. *Entrepreneurship*, VI (2), 215–228.

Financial Conduct Authority. (2016). *Call for input on supporting the development and adopters of RegTech*. Feedback Statement FS16/4. London.

Financial Stability Board. (2017). *Artificial intelligence and machine learning in financial services – market developments and financial stability implications*. Basel.

Finch, G. (2017). *World's biggest banks fined $321 billion since financial crisis*. Bloomberg, March 2, 2017.

Institute of International Finance. (2015). *RegTech: exploring solutions for regulatory challenges*. Washington, DC.

Investopedia. (2020). *What is RegTech?* Retrieved 05 May 2020 from the Investopedia Web site: https://www.investopedia.com/terms/r/regtech.asp.

Hammond, S. (2016). *Ten things compliance officers need to do in 2015*. Thomson Reuters.

Madgerova, R. and Kyurova, V. (2014). Definition, characteristics and problems of family business. *Economics and Management*, X(2), pp. 97–105.

Nedeltchev, D. (2002). *Institutional change and European integration*. Sofia: Academic Publishing House "Prof. Marin Drinov".

Nedelcheva, Y. (2017). Business Strategies in Industry 4.0. *Entrepreneurship*, V (2), 77–84.

Roberts, G. (2016). *FinTech spawns RegTech to automate compliance with regulations*. Bloomberg Professional June 28, 2016.

Stankovska, A., Dimitrieska, S. and Stamevska, E. (2018). FinTech in modern banking industry. *Economics and Management*, XV (2), 20–26.

Stoimenova, A., Kirilov, B. and Zaykova, K. (2019). Analysis of good distribution practice inspection deficiency data of pharmaceutical wholesalers in Bulgaria. *Pharmacia*, 66 (3), 85–89.

Thomson Reuters. (2016). *Cost of compliance*.

Tsvetanova, Y. (2014). Features of internal audit in pharmaceutical industry. *Pharmacia*, 61 (2), 30–34.

UK Government Chief Scientific Advisers. (2015). *FinTech futures – the UK as a world leader in financial technologies*. London.

World Bank. (2017). *Promoting financial inclusion policies and regulations in Jordan*. Report No. PIDC113496, Washington, DC.

Yang, Y. and Tsang, C. (2018). RegTech and the new era of financial regulators: envisaging more public-private partnership models of financial regulators. *University of Pennsylvania Journal of Business Law*, 21 (2), 354–404.

Yuleva, R. (2019). State and development of theoretical knowledge about innovation. *Economics and Management*, XVI (2), 157–166.

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TESTING METHODS AND MODELS TO FORECAST CRYPTOCURRENCIES EXCHANGE RATE[1]

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Abstract

The course of cryptocurrencies forms by various factors which makes it difficult to apply fundamental methods for their forecasting. For these reasons technical analysis and various statistical models are used for short-term forex and financial market forecasting. In this study we test three models: the classical autoregression model (AR), the Box-Jenkins ARIMA, and the predictively modified model Frequency Analysis of the Volatility and Trend with movable calculation (FAVT-M). The five cryptocurrencies with the largest market capitalization as of July 10, 2019 are subject to test forecasting. The AR and ARIMA results report compromise confidence within the first 5 - 6 days, after which they show significant deviations from the actual course achieved. FAVT-M generates immediate signals for the reversal of the short-term trend, but at this stage they are not clear enough for its reliable independent application in forecasting cryptocurrencies.

Keywords: *cryptocurrencies, autoregression, ARMA, ARIMA, predictively modified frequency analysis of volatility and trend (FAVT+M).*
JEL Codes: *G17; C19; C58*

Introduction

Currency value is formed under the combined effect of multiple macroeconomic and political factors, which is the cause for their complicated and not vary accurate forecasting, especially in long term. On one side, there is a huge uncertainty in the evolution of the different factors and their complicated multiplicative and interference

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patterns. On the other, the fundamental analysis explains how given factor affects the value of given currency, but is not in the condition to give timely information for the upcoming change in the currency course. Under these objective circumstances the speculators of the FOREX base their strategies on a technical analysis that is more successful on reading short-term market signals due to the liquidity of the most converted currencies. Fin-tech and in particular the block-chain technologies introduce additional and even more difficult to predict determinants mainly related to the market actions of the the ones acquiring and using the respective cryptocurrency.

Considering that the main goal of the study is to analyze and test different quantitative statistical and econometric forecasting models applied in the forecast of cryptocurrencies. In order to determine the applicability of the given model we apply retrospective approach, in other words we forecast the value and return in historical sample and compare the results with the actual data for the cryptocurrency. In the process as byproduct we infer the predictability of the cryptocurrency itself.

1. Methodology of the study

1.1. Forecasting via auto-regressive method

As it is known the auto-regressive (AR) model is used to analyze and forecast returns and prices of financial instruments, which makes the AR modeling highly applicable in the investment management. An obligatory condition for the application of autoregressive models is that the time series is stationary. For that purpose we apply first the stationarity test of Dickey and Fuller (Dickey & Fuller, 1979). From methodological point of view, the auto-regressive model is a linear regression. Unlike the popular regression analysis, where the emphasis is put on a factors external for the studied value, in the AR models the factor is the historic values of the same variable. In this way the price predicts itself. The formula of the auto-regressive model has the following form (Bohte & Rossin, 2019):

$$P_t = \alpha + \varphi_1 P_{t-1} + \varphi_2 P_{t-2} + \varphi_p P_{p-t} + \varepsilon_t \quad (1.1)$$

where:

$P_t -$ forecast value;

α – constant;

φ–auto-regressive parameter.

The logical question here is what time lag should be included in the final equation of the forecast model. For the goals of the study (the five cryptocurrencies) we apply an

AR model with time lags of 1 to 10 days. We use the two criterions - Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC), where the condition is to select the lowest value specification. Through the information criterions AIC and BIC we seek balance between reducing the standard error and reducing the number of degrees of freedom (Иванов & Овчинников, 2018). (It is a mandatory) condition for both criterions to have an identical sample of data. The (valuation) formula of Akaike Information Criterion is following (Akaike, 1974):

(1.2) AIC = N*LN(SS/N) + (2*df)

където:

AIC – Akaike Information Criterion;

N – number of observations;

SS – residual value of the squared deviation for the model;

Df – degrees of freedom.[1]

The formula for the calculation of the Bayesian Information Criterion (BIC) has the following form (Vrieze, 2012):

(1.3) BIC = N*LN (SS/N) + (df*LN(N))

където:

BIC– Bayesian Information Criterion;

N – number of observations;

SS – residual value of the squared deviation for the model;

Df – degrees of freedom.

Both information criterions have similar application for defining the final specification of ARIMA models to the Box-Jenkins methods using corelograms to derive the model specifics, described later.

1.2. Methodology of ARIMA forecasting

In order to present the forecasting with ARIMA models additionally to the explanation of the autoregressive model (AR) we should focus attention to the moving averages (MA partition of the model). Modelling with moving averages is assuming that the factor which determines the future value of a variable is the average of its previous (historical) values. The order of the model is derived by the past periods used for the

[1] Degrees of freedom in this case show the type of regression compared to the number of included factors. It follows that in auto-regression the factors are the different lagged values of the first difference of the dependent variable.

average. Additionally, as the forecast is getting further (in the future) with respect to the current value, a greater portion of the forecast is based on prior forecasts. If we combine both, the AR and MA modeling we reach ARMA (Auto Regressive Moving Averages) and if the used data is non-stationary we integrate the time series. In the process of integration, we use for further calculation the differences between current and previous values ($\Delta y = y_t - y_{t-1}$) and we can use more than single integration if necessary. Then we derived the so called ARIMA model or Autoregressive Integrated Moving Averages. **Such a** model has tree specification – p, d and q. Each represents a different part of the modeling**:** p is the order of the AR model, q - the order of the MA model and d - the integration. (Thus, ARMA can be considered as a special case of ARIMA in which $d = 0$ or no data integrations.

One way to derive the p, d and q is to apply the Box-Jenkins method (Box & Jenkins, 1970). The first step is to define the required integration in order to force stationarity on our sample. We use the Dickey-Fuller test (Dickey & Fuller, 1979) to determine if stationarity is present again after each step of integration. Next step is the application of the autocorrelation function (ACF) and the partial autocorrelation function (PACF) and more precisely their graphics. ACF is based on the correlation between different orders of AR or MA models to the base value of the variable, practically it measures the change of the correlation with the increase of lags. The PACF is a bit harder to present, as regression based on the same increasing lags, where we calculate the values of the Betas of the corresponding lag. In order to structure graphically PACF we use only the Betas with p-value below 5% or with less than 5% risk of error. Based on the graphics we determine the p and q and for this part of the method is said to be more art than science (Zaiontz, 2019a).

1.3. Stationarity testing (Dickey-Fuller)

Dickey-Fuller test (Dickey & Fuller, 1979) aims to determine if a data set is stationary by disproving the existence of unit root and if so, the data can not be accepted as stationary. The test is based on regression analysis and more precisely auto-regression. Depending on the data set we can apply one of three models:

(2.1) Without constant and trend: $\Delta y_t = \beta y_{t-1} + \varepsilon_t$;

(2.2) With constant and without trend: $\Delta y_t = \alpha + \beta y_{t-1} + \varepsilon_t$;

(2.3) With constant and trend: $\Delta y_t = \alpha + \beta y_{t-1} + \beta_t T + \varepsilon_t$.

where:

Δy_t –is the difference y_t-y_{t-1}, or the integrated value;

B –beta of the factor in the auto-regression;

ε_t– random drift;

α – constant;

βtT –trend component.

We determine the model due to the value of the derived beta coefficient. If the beta is negative we can accept the model and further analyse the data. After deriving negative value of the Beta coefficient we can use the t-statistics (tao) to examine if there is a stationarity. We use a function to derive the critical or theoretical value of tao below which we can accept the result and therefore the data are stationary. Additional information about the test and the function of critical tao (including table of tao values) can be found on (Zaiontz, 2019b).

1.4. Modified in forecasting application Frequency analysis of volatility and trend with moving calculation FAVT+M

The Frequency analysis of volatility and trend (FAVT) with moving calculation includes three coefficients:

(3.1) Coefficient of Dynamics (D): $Dinamix = \frac{Days_{Change}}{Days_{n-1}}$;

(3.2) Coefficient of the Average duration of unidirectional movement (AD_{UM}):

$$Averag\ Duration_{\ Unidirectional\ Movement} = \frac{Days_{n-1}}{Days_{Change}};$$

(3.3) Coefficient of the prevailing tendency(PT):

$$Prevailing\ Tendency = \frac{Days_{Increase}}{Days_{Decrease}}$$

As you can see, the first two coefficients have reciprocal calculation and complementary information significance. The D (dynamics) numerator and AD_{UM} denominator represent the number of changes in course direction of the instrument. FAVT was developed for stock exchange activity analysis and its methodology is presented in details in a 2016 monograph (Симеонов, 2016). In several previous studies, summarized in the above monograph, we apply empirically FAVT to analyze the main indicators of the Bulgarian Stock Exchange (Симеонов, Септември 2015), (Симеонов, Ноември 2015), (Симеонов, ноември 2016). In the study of 2017 we present methodologically and empirically the application of FAVT in assessing market risk for BSE-traded shares (Simeonov & Todorov, 2018). In the study of 2019 we develop methodologically the concept of predictive application of frequency analysis by movable calculation of the frequency coefficients (FAVT-M) and we test it empirically on major stock indices of several European stock exchanges (Симеонов, Тодоров, & Николаев, 2019). Encouraging results were achieved in the short-term forecast of more drastic changes in the trend of stock indices. Unlike stock indices, which are a composite

measure and instrument, in individual investment instruments we expect better results than the foreseen application of the FAVT-M. Nor do we overlook the considerations set out in the introduction to the complexity of currency rates forecasting.

We emphasize that the rolling calculation of the frequency coefficients is not related to averages, but to a moving (rolling) calculation period. The rolling calculation provides an opportunity to track the change in the coefficients with the introduction of each new (last) daily value. The choice of the base period is based on a preliminary analysis of the "average duration of unidirectional movement" (AD_{UM}) of the studied instrument, in this case - cryptocurrency. The application of the forecasting model is facilitated by a duration of the calculation period close to the specified maximum unidirectional movement.[1] In this study we apply a 14-day basis for the mobile calculation of the frequency coefficients and the coefficient of variation that we use as standard in the FAVT. It should also be noted that the theoretical maxima and minima of the frequency coefficients are of greater importance for their analytical application and static calculation over a given period, for example in risk analysis. On the other hand, the interpretation of the predictive value of the frequency coefficients focuses on their variation and the accumulation of minima and maxima in their mobile calculations.

2. Object of empirical study

In our study we examine the five leading cryptocurrencies Bitcoin, Ethereum, XRP, Litecoinand Bitcoin Cash. The selection is made by the market capitalization (money mass) in USD, and we chose the top five by quantity for the 10.06.2019. The sample includes the daily values for the period 28.04.2013 through 10.07.2019.[2]

Table 1. Cryptocurrencies with greatest capitalization for 10.07.2019

N	Cryptocurrency	Market capitalization
1	Bitcoin	216.515.999.522
2	Ethereum	30.985.827.113
3	XRP	15.484.656.712
4	Bitcoin Cash	6.979.428.054
5	Litecoin	6.792.744.022

[1] Detailed arguments for the determination of the period for the chain calculation of the frequency coefficients are given in the study cited above by Simeonov, St., Todorov, T., and Nikolaev, D. E-Journal Dialogue 1, 2019.

[2] The date for the daily change of the value of the cryptocurrencies is accessible on https://coinmarketcap.com/currencies/bitcoin/historical-data/.

3. Forecasting the value of the selected cryptocurrencies

3.1. Application of Auto-Regressive model in forecasting the value of cryptocurrencies

The application of the AR model for each of the five chosen cryptocurrencies is with time lag of 1 to 10 days. The best predictive model for the analyzed currencies is determined with the information coefficients Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC). From the application of both coefficients with 1 to 10 lags, the best forecast for the value of the cryptocurrencies is given by a single lag, or AR-1, the values are given in Table 2. The forecast period here is 30 days, from 11.07.2019 until 09.08.2019.

Table 2. Results from the application of AIC u BIC

Cryptocurrencies	Specification of the model	AIC	BIC
Bitcoin	AR (Pt - 1)	24865	24871
Ethereum	AR (Pt - 1)	8723	8729
XRP	AR (Pt - 1)	-13789	-13783
Litecoin	AR (Pt - 1)	7321	7326
Bitcoint Cash	AR (Pt - 1)	6606	6610

The graphical presentation of the results is given below with two lines: the first represents the foretasted values and the second is constructed from the factual values of the analyzed cryptocurrency.

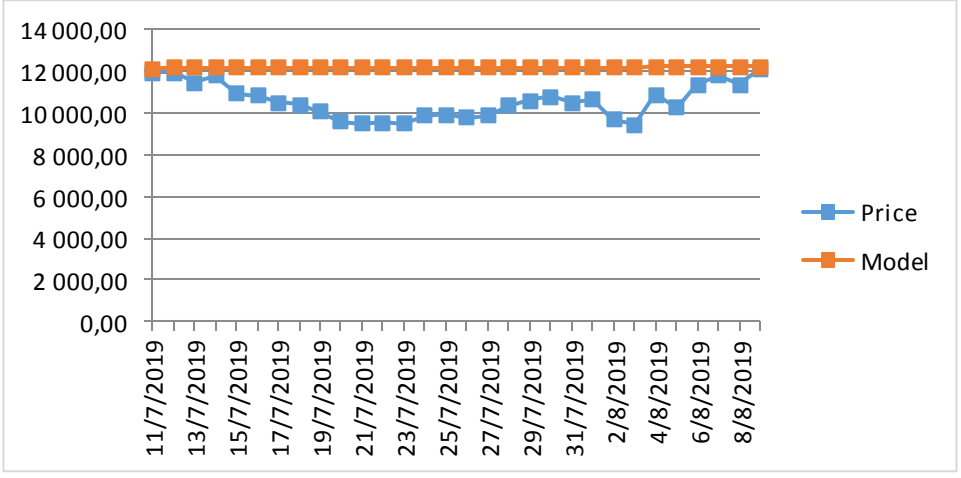

Figure 1.1. AR-1 forecast of Bitcoin

From figure 1.1. is visible that for the first few days of the forecast the results are consistent with the real data. The line presenting the foretasted data predict a near static values with insignificant increase of Bitcoin. The actual price of the currency doesn't confirm such a prediction. The historically calculated beta coefficient is above 1 and the fact that the previous prediction is a base for the present, describes a model with single direction which can not fit the factual values.

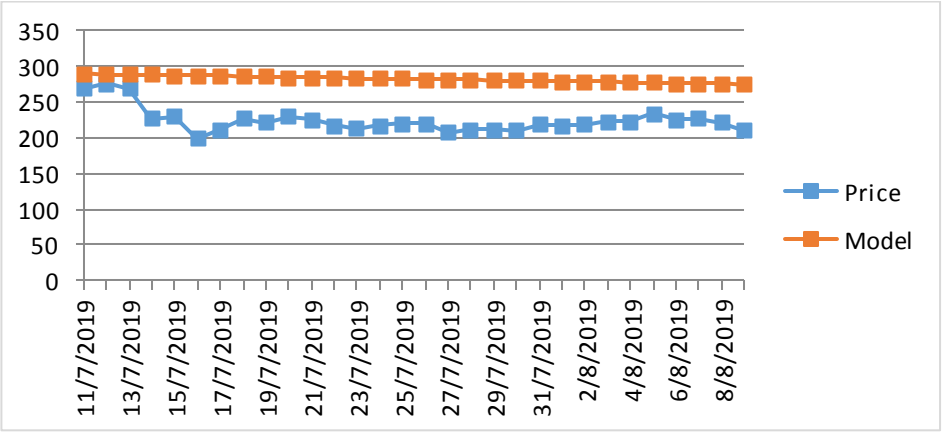

Figure 1.2. AR-1 forecast of Ethereum

The forecast values of AR-1 for Ethereumhave the greatest deviation from the actual results from all the analyzed currencies (Figure 1.2.). We can conclude that during the analyzed period the auto-regressive model does not fit the forecast requirements for Ethereum.

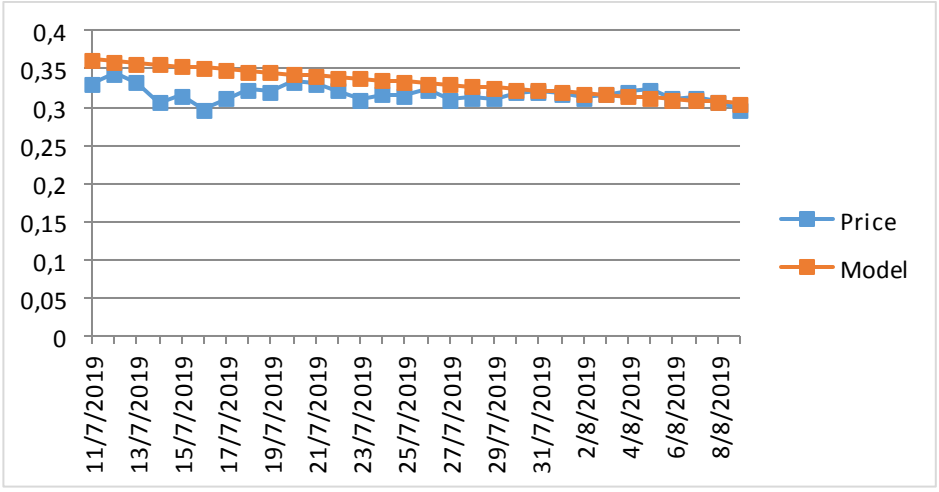

Figure 1.3. AR-1 forecast of XRP

The results reached by AR-1 for XRP are considerably different form Bitcoin and Ethereum (Figure 1.3.). The AR model registers the best forecasts in the end of the forecast horizon. The figure shows an accurate forecast in the longer-term prediction (20 – 30 days), while in the shorter (10 days) XRP is overpriced by the modeling. On the bases of statistical criterion average daily error (MAPE), calculated for 15 and 30 days, Litecoinhas the smallest values after XRP (Figure 1.4.).

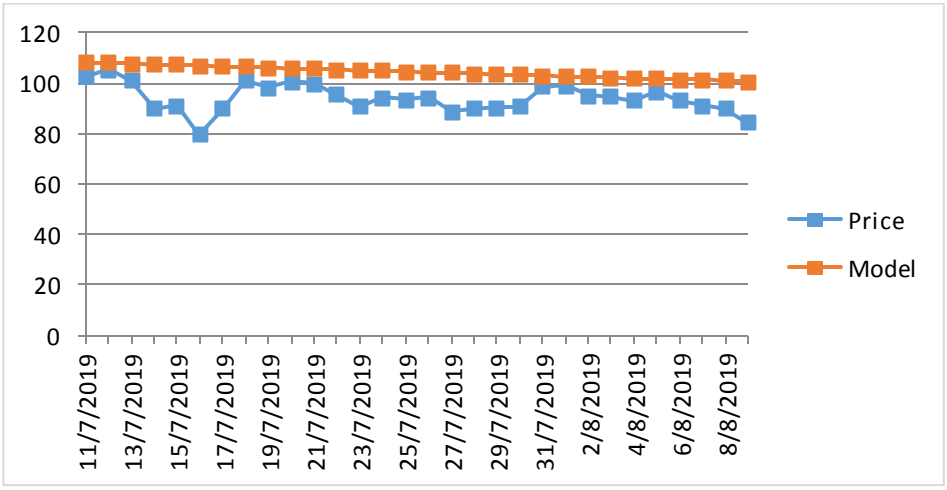

Figure 1.4. AR-1 forecast of Litecoin

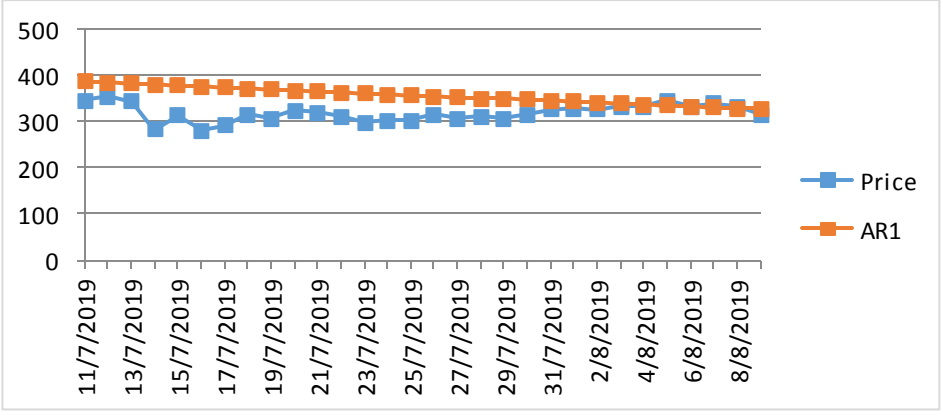

Figure 1.5. AR-1 forecast for Bitcoin Cash

The forecast with AR-1 for Bitcoin Cash is most reliable for the last 10 days of the forecasted 30 day period, same as the results for the cryptocurrency XRP (Figure 1.5).

Table 3. Average daily error AR-1 (%)

Days	Bitcoin	Ethereum	XRP	Litecoin	Bitcoin Cash
5	4,68	14,21	9,91	10,43	17,48
15	16,43	25,27	8,48	11,93	19,41
30	15,84	26,45	5,30	11,38	12,80

With the statistical value of average daily error we refine the results of the auto-regressive model for the five cryptocurrencies in three time frames of forecast – 5, 15 and 30 days (table 2). In the short-term (5 days) forecasts the lowest values for error are calculated for Bitcoin. The largest deviation for the same time frame are calculated for Bitcoin Cash. Mid-term – 15-daysforecast is most successful for the cryptocurrency XRP. The average daily error confirms the results from the figures above, where the best 30-day forecast is ascribed to XRP. The greatest deviation from the real data is measured for the Ethereum cryptocurrency. Of interest is the success of forecasting at different timescales. With the smallest average error of 4,7% are the results for short-term (5-days) forecasts, followed by the long-term 30-days forecast with 5,3% (XRP) and the final is the 15-days forecast with smallest deviation of 8,5% (XRP). The biggest errors are registered at the 30-day forecasts with 26,5% (Ethereum), followed by the 15-days 25,3% (Ethereum) and 17,5% (Bitcoin Cash) at the 5-day forecasting.

We can conclude that other forecasting tools are needed to evaluate and improve forecasting results.

3.2. Application of Box-Jenkins ARIMA in forecasting cryptocurrencies

For the Box-Jenkins forecasts we use reduced historical information or the time frame of the sample used for forecasting is two months - from 11 April to 11 July 2019. Because our forecast horizon is comparatively short, only one month and we use daily observations we can shorten our base data in order to capture the most recent changes in the variation. As such the application of the Box-Jenkins and the results of the PACF show us little room for interpretation as most currencies have no more than one acceptable value (under restriction of confidence range of up to 10%).

On the following graphic are presented the results from the application of ARIMA (1; 0; 9) for the forecast of Bitcoin. We use cumulative return to illustrate the results of the model. The forecast of Bitcoin illustrated by the graphic is of good consistency as we can determine even from the figure that the error is reasonable and additionally at the end of the forecast we observe a very little gap between the estimation and the actual values (Figure 2.1.).

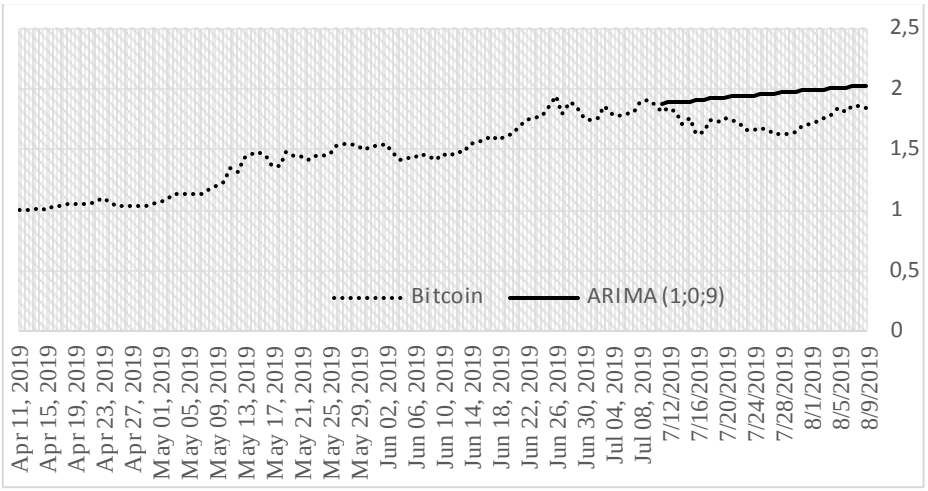

Figure 2.1. Box-Jenkins ARIMA forecast of Bitcoin

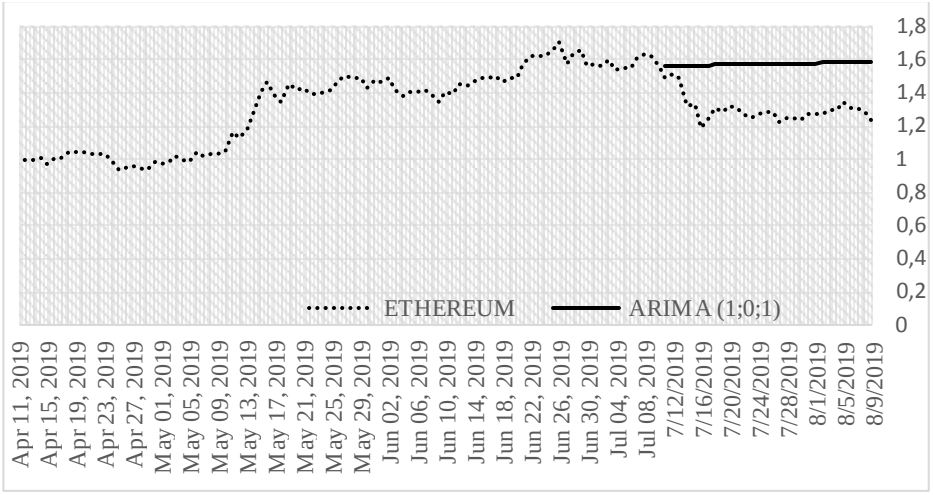

Figure 2.2. Box-Jenkins ARIMA forecast of Ethereum

The results indicate the forecast have a significant deviation from the observed values. We can see a great descent at the start of the forecast which can be accepted as random drift. Although the motion after that is parallel we can not estimate that the forecast is reliable enough due to the great differences between the forecast and actual returns.

Although there is a significantly greater descent in the estimation, we can accept the results for Ethereum as comparatively reliable due to the far lesser average daily deviations (Figure 2.2).

We can notice that there is a significant gap between the actual and the forecast values of XRP, where the forecasted rate is greatly underestimated (Figure 2.3).

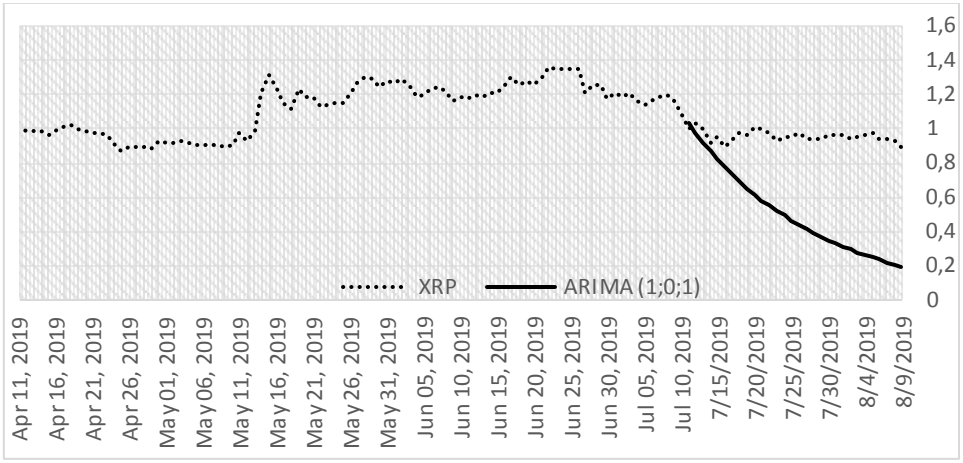

Figure 2.3. Box-Jenkins ARIMA forecast of XRP

From the graphic of Litecoin we can observe very similar condition as the forecasts for Ethereum. There is a sharp descent starting slightly before the forecast and although there are moments in which the values of the observation and forecasts get closer together there is a significant difference between the average return of the actual observations and the forecasts (Figure 2.4).

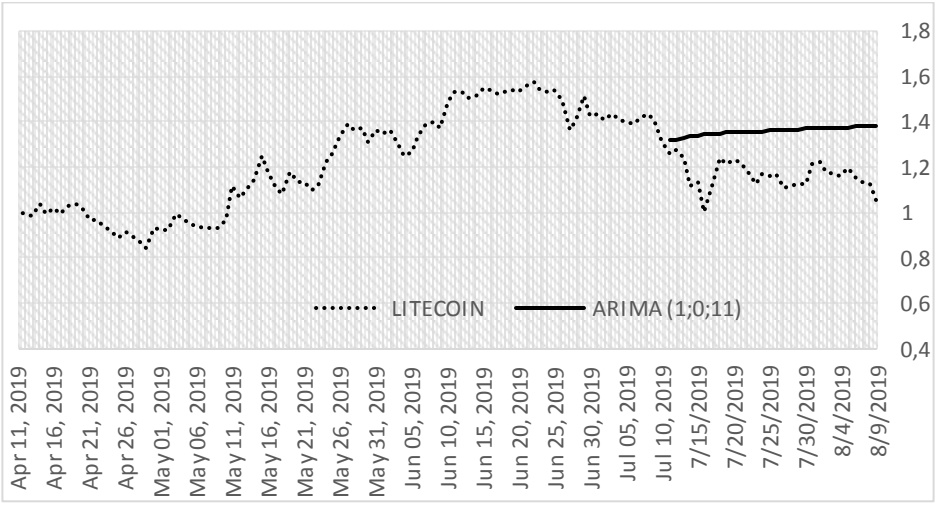

Figure 2.4. Box-Jenkins ARIMA forecast of Litecoin

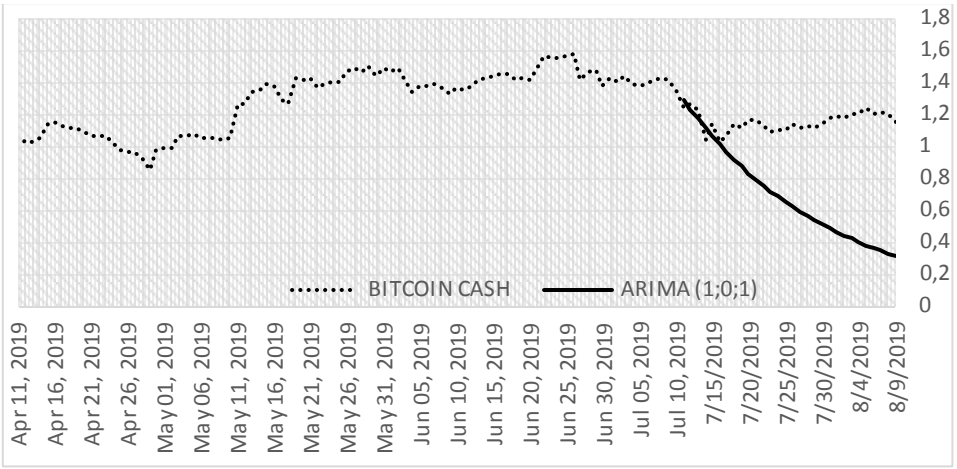

Figure 2.5. Box-Jenkins ARIMA forecast of Bitcoin Cash

On figure 2.5. the results are very similar to those of XRP, we expect far greater reduction in value then the observed, but it is a reduction in value still. In other words we expect a loss of value, but our estimation is far greater then the actual but in such conditions the actual daily average drift is not that great.

Additionally we analyze the errors from the predictions of ARIMA based on Box-Jenkins and the calculated results are presented in Table 4.

Table 4. Average daily error Box-Jenkins ARIMA forecasts (%)

Forecasting term	Bitcoin (1, 0, 9)	Ethereum (1, 0, 1)	XRP (1, 0, 1)	Litecoin (1, 0,1 1)	Bitcoin Cash (1, 0, 1)
5 day	4,42	5,55	4,86*	5,87	8,44
15 day	2,53	3,38	6,04*	4,58	6,76*
30 day	1,95*	2,57	5,57*	3,59	5,85*

Firstly we want to draw attention in the values marked by *, as those are the differences in which there is aliment between the direction of the average return of the factual values and the forecasts. As we can see in 3 out of 5 forecasts the estimated direction of the return is correct. Additionally we can observe in almost all forecasts (except XRP) that with the increase of the retrospectively observed results the average error is reduced as the random drifts become more insignificant. This can make us believe that although not perfectly and with great deviations the values of the crypto currencies

are predictable to a degree. As the nature of the data is probabilistic it is expected to have a random drift but from the observed data it is more likely that a 30 day forecast by ARIMA applied with the Box-Jenkins method will be beneficial and will yield positive results.

3.3. FAVT-M testing for cryptocurrency forecasting

We present here the results from Frequency analysis of the volatility and trend with moving calculation only for Bitcoin, due to volume restrictions. We use historical daily values for a period from 01.01.2019 to the end of July 2019. In order to have visual comparability between the lines of the frequency coefficients and the variation coefficient with the line of Bitcoin the figure 3.1. we present the values of Bitcoin divided by 3000. We use 14 day period as a base for the moving calculation of the variables. Line of the Coefficient of the prevailing tendency (PT) illustrates the dominant direction of change which due to the magnitude of the deviations may fit the trend line, without it being expected. The interpretation of that dependent variable requires special attention. In general, the clumps of sharp edges and plateaus shows the most notable periods of defined trend and by definition of the concept it should be the harbinger of short-term corrections. The high values of the coefficient of average duration of the unchanged motion (AD_{UM}) demonstrates the longer (few days long) expectations. Coefficient of dynamics (D)is reciprocal to AD_{UM} and by definition the high values of D signal that soon there will be change in the trend.

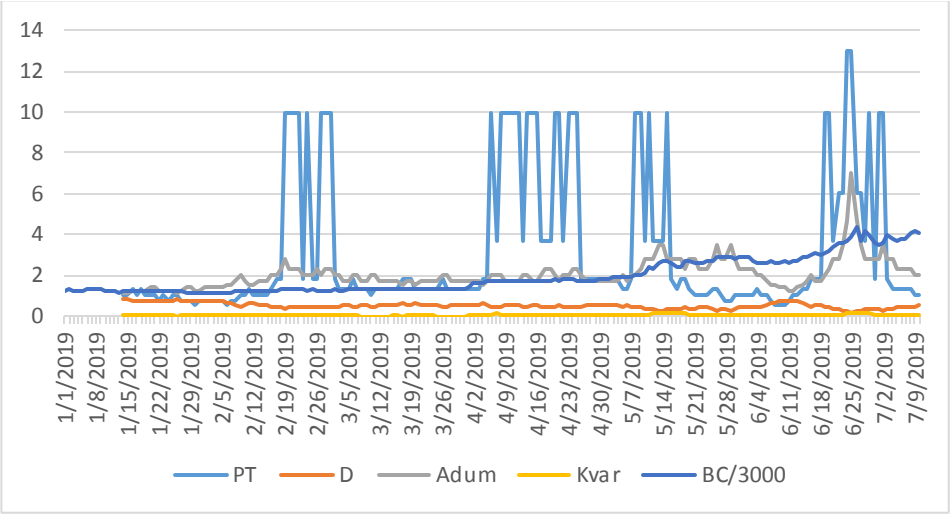

Figure 3.1. FAVT+M forecast of Bitcoin

Table 5. Sample form the FAVT-M for Bitcoin

Date	Bitcoin	Change	PT	D	AD_{UM}	Kvar
23.6.2019	10855,37	153,68	6	0,29	3,50	0,1076
24.6.2019	11011,10	155,73	13	0,21	4,67	0,1157
25.6.2019	11790,92	779,82	13	0,14	7,00	0,1358
26.6.2019	**13016,23**	1225,31	6	0,21	4,67	0,1269
27.6.2019	11182,81	-1833,42	6	0,29	3,50	0,1288
28.6.2019	12407,33	1224,52	3,67	0,36	2,80	0,1235
29.6.2019	11959,37	-447,96	10	0,36	2,80	0,1136
30.6.2019	10817,16	-1142,21	1,8	0,36	2,80	0,1060
1.7.2019	10583,13	-234,03	10	0,36	2,80	0,0938

Table 6. Coefficient of correlation between Frequency coefficients and the lagged return of Bitcoin

Lag	PT	D	ADum	Kvar
0	**17,11%**	**-56,89%**	**63,74%**	**63,85%**
-1	16,79%	-57,02%	62,82%	64,48%
-2	15,37%	-56,14%	61,04%	64,39%
-3	17,06%	-55,09%	59,30%	63,59%
-4	14,16%	-53,73%	56,93%	62,24%
-5	15,48%	-52,58%	54,96%	60,40%
-6	17,26%	-52,31%	55,05%	58,07%
-7	13,54%	-50,82%	53,51%	55,22%
-8	10,28%	-49,36%	52,31%	52,27%
-9	7,48%	-47,01%	49,89%	49,40%
-10	4,89%	-44,92%	47,79%	46,83%
-11	2,12%	-42,56%	45,04%	44,75%
-12	0,07%	-40,42%	42,24%	43,32%
-13	-2,36%	-37,75%	39,42%	42,05%
-14	-3,96%	-33,54%	36,89%	40,97%

Under closer observation of figure 3.1. and the sample of table 5. we can spot a stable increase of the value of Bitcoin through the second and third periods of 10 days of 2019 is combined with decrease of the Coefficient of Dynamics ***(D)***, accordingly also with noticeable growth and spikes of $\boldsymbol{AD_{UM}}$ and increase in the Coefficient of Variation ***(Kvar)***. On June 26, 2019, sharp and dynamic adjustments to the Bitcoin exchange rate began. In the previous few days clearly show the achieved theoretical maximums of ***PT*** (prevailing tendency), the low values of***D***, the high value of $\boldsymbol{AD_{UM}}$ as well as the achieved

growth of ***Kvar.*** While on June, 26 Bitcoin is still growing and reaching its maximum for the time frame, the three frequency coefficients and the variation coefficient are already reversing.

The correlation between the frequency coefficients and the value of Bitcoin is significantly low. The coefficient of average duration of unchanged motion and the coefficient of variation have normal straight interdependence. As a result, the coefficient of dynamics has reverse correlation. Coefficient of persistent trend has straight but vary weak correlation. The lagged values from 1 to 14 days demonstrates reduction in the degree of correlation which strengthens the previous analytical comments and reinforces the results from previous forecasting of stock exchange indexes. Whereby we establish forecast signals derived from FAVT+M with a horizon up to several days.

Conclusion

The results of the empirical forecast tests of the five most active cryptocurrencies can be summarized in the following conclusions:

- Despite the partial similarities between factual market data and forecast results given by the three approaches, the predictions are inadequate and can not be considered an effective way to forecast cryptocurrencies.
- The forecasts with the classical auto-regressive models give partially good results in short-term forecast of 5-day followed by a 30-day period or the longest period available. Within the monthly forecast all five cryptocurrencies overvalues the factual currency rates.
- Unlike the previous model the ARIMA is used to forecast returns. The empirical testing of Box-Jenkins method has promising forecasts for the some of the cryptocurrencies, but the results are not reliable enough, especially for giving exact values of expected return.
- The modification in the forecast model FAVT (frequency analysis of the volatility and trend) with moving calculation applied for Bitcoin allows the predictions of signals, but at this stage they are not good enough for reliable by himself forecasting.

REFERENCES

Akaike, H. (1974). A new look at the statistical model identification. *IEEE Transactions on Automatic Control*.

Bohte, R., & Rossin, L. (2019). Comparing the forecasting of cryptocurrencies by Bayesian time-varying volatility models.

Dickey, D., & Fuller, W. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, стр. 427–431.

Simeonov, S., & Todorov, T. (Book 1 2018 r.). DESIGNING THE INVESTMENT PROFILE of the shares traded on the Bulgarian Stock Exchange, in the period from August 2016 to December 2017“. *Interuniversity Journal "Economics 21"*.

Vrieze, S. (2012). "Model selection and psychological theory: a discussion of the differences between the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC)". *Psychological Methods*.

Zaiontz, C. (14 November 2019b r.). Augmented Dickey-Fuller Table. Retrieved from Real Statistics Using Excel website:.

Иванов, Л., & Овчинников, Е. (2018). Приложни аспекти на иконометричното моделиране на динамични зависимости. *Алманах "Научни изследвания" Том-26*, 209.

Симеонов, Ст. (2016). *Измерители на борсовата активност, изследване на индикаторите и анализ на пазарния тренд* (Том 131). (Библиотека „Стопански свят“, Ред.) Свищов: Академично издателство „Ценов”.

Симеонов, Ст. (Ноември 2015). Инвестиционна активност на българска фондова борса - анализ на променливостта на пазарната капитализация“. *Развитието на българската икономика – 25 години между очакванията и реалностите, 25 г. катедра „Обща теория на икономиката”, СА „Д. А. Ценов"*. Свищов.

Симеонов, Ст. (ноември 2016). Сравнителен анализ на променливостта на индикаторите за инвестиционна активност на българска фондова борса (за периода 2006 – 2014). *Международна научна конференция „Икономическо благосъстояние чрез споделяне на знания”, 80 години Стопанска академия "Д, А. Ценов"*. Свищов: АИ "Ценов".

Симеонов, Ст. (Септември 2015). Анализ на променливостта на инвестиционните индикатори на Българска Фондова Борса (BG40 и борсови обороти). *Международна научна конференция „Инвестиции в Бъдещето“*. Варна.

Симеонов, Ст., Тодоров, Т., & Николаев, Д. (2019). Развитие на честотния анализ на променливостта в модел за прогнозиране тренда на финансовите пазари и сравнителна емпирична оценка с техническия анализ“. *Електронно списание "Диалог", Бр. 1,*

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MACHINE LEARNING ALGORITHMS FOR FORECASTING ASSET PRICES: AN APPLICATION TO THE HOUSING MARKET

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Abstract

This article investigates the application of advanced machine learning algorithms for forecasting housing prices. To this end we leverage a dataset of 414 observations of housing deals in Taipei and model it with both traditional econometric and novel machine learning algorithms. An exhaustive search among 107 alternative methods is conducted and their forecast accuracy is reported in detail. Using the root mean squared error (RMSE) as a benchmark metric, we find that implementations of the random forest family have superior performance, far surpassing that of more traditional approaches such as the multiple linear regression. The results have utility for both academics and practitioners and can be easily transferred to other forecasting problems in economics and business.

Keywords: *asset prices, real estate, forecasting algorithms, machine learning*

JEL Codes: *C52, C53, R31*

1. Introduction

Modern organizations perform a wide array of complex activities in their regular operations. In addition to the usual business processes of production, delivery and support, many organizations also have activities related to the acquisition and management of tangible fixed assets, including real estate. The pricing of this estate is necessary to estimate for the purposes of accounting, financial planning, and, most importantly, strategic management. Under standard practice, this is often done with the help of a dedicated expert appraiser who combines objective market data with subjective judgment and adjustments to arrive at a final assessment. The main problem with this approach is that it is largely dependent on human judgment, which makes it relatively expensive, slow and difficult to scale. These factors result in infrequent or even one-off property valuations, although a dynamic market environment often implies significant dynamics.

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In the age of digital transformation this no longer needs to be the case. Modern data storage and processing technology, combined with powerful machine learning algorithms allow organizations to automate the process of real-time valuation of a given property, which can enable its rational management. This article focuses on the best statistical and machine learning methods to forecast housing prices. It aims to review and compare a wide set of popular forecasting algorithms and outline which provide the most accurate results for housing prices. This task is of interest to both organizations involved in the sale and purchase of real estate (construction companies, brokers, etc.), as well as organizations involved in the financing and securitization of transactions (banks, non-bank credit institutions, funds, etc.).

The article is structured as follows: section two presents a compact literature review of popular statistical methods and their application to forecasting housing prices; section three introduces the data set under study and reports its descriptive statistics. Section four applies five of the most common algorithms for modeling the data at and, while section five conducts an extensive search for the best forecasting algorithm among a set of 106 methods. Finally, section six concludes.

2. Literature Review

Prediction of housing prices is a highly relevant business problem that has also attracted significant attention from researchers. A standard model for this valuation is the hedonic pricing approach, whereby prices are determined by both intrinsic characteristics of the real estate, as well as characteristics of its environment (Sirmans et al, 2005). Among the former we can include the size and type of the property, the number of rooms, different features, overall condition, year of construction, location and many others. Among the latter are the characteristics of the neighborhood, transport connectivity, number of shops, crime rates, different amenities and possibly numerous other factors. Essentially, the hedonic pricing approach measures what the consumer is willing to pay given the presence of a set of characteristics (ibid.). All those can be summarized as explanatory (independent) variables, and the resulting housing prices – as a target (dependent) variable.

Alternatively, one can apply a relatively theory-free set of algorithms to estimate precise pricing, given a known structure of the dataset. Many researchers are exploring methods such as artificial neural network and comparing them to the more traditional approaches leveraging hedonic pricing (see e.g. Ghorbani & Afgheh, 2017), or using pure methods from machine learning such as neural networks (Lim et al., 2016) or support vector machines (Chen et al., 2017). While some authors use more than one method for prediction (e.g. Yeh & Hsu, 2018), they still leverage a somewhat limit set of algorithms that are not guaranteed to produce the best results. Therefore, we outline the need for an

exercise to create an exhaustive testing of (almost) all relevant regression algorithms and identify the ones with best forecasting performance.

The most popular types of algorithms for such a task include both tradition econometric tools such the multiple linear regression as well as a set of more advanced machine learning ones such the neural network, the support vector machines, the k-Nearest Neighbor algorithm, and the decision trees and random forest approaches. Here, we shortly review the less well-known approaches and point the interested reader to Hastie et al. (2009) for a more detailed description.

Neural networks are computational algorithms whose structure is strongly influenced by the way the human brain functions. It consists of neurons that send activating impulses to each other, this system forming a biological neural network. In a statistical neural network, the architecture of the algorithm is similar, with neurons playing different variables and values, and activation performed by a predetermined mathematical function. It calculates and transmits the various values within the model. The explanatory dependent variables form the input layer of the neural network. Each of these variables influences the estimation of the final target variable by a series of weighted functions, called a non-linear weighted sum (sum). In short, the input layer transmits activation pulses, calculated according to a particular activation function K, to the first intermediate layer. It, in turn, uses these impulses as input to its activation functions to the next layer, and so to the last one that defines the final target variable. For more details on the statistical features and characteristics of neural networks, we refer the reader to Ripley & Hjort (1996).

The **k-nearest-neighbors (kNN)** algorithm has a long history of various classification applications, which is due both to its relative simplicity and to the relatively good results it produces. The basic idea behind it is that it is a classification algorithm that uses the already known classes, which are located close enough to a given observation to determine the class of the observation itself. For more details on the calculation and statistical properties of this algorithm, we refer the reader to the work of Peterson (2009) and Hastie et al. (2009). We emphasize that although it is a compact and relatively intuitive algorithm, it can be successful in a number of situations, and its results are particularly good in cases with irregular boundaries between different classes of data or in which each class has a number clearly differentiated prototypes.

Decision trees are an alternative model for modeling tasks related to recognizing different classes. Using an array of test data, the trees select the best classifier among a set of explanatory variables, with the process flowing iteratively. Initially, at the first node, the algorithm selects the variable that best distinguishes the classes from one another and selects its optimal value for classification. The task is then branched to the value of this variable and the new nodes re-selected the optimal variable and its value, resulting in new branching. When a decision is made, the graphical presentation of the results looks very much like an inverted tree, where its name comes from. Their main

problem is that they are over-adjusting to the data they are trained on (so-called overfitting) and that the algorithm can be misled by local optimists. As a result, excellent predictive power can be obtained within the data examined and much lower - on another set. To solve the major problems of decision trees such as high variation and over-adjusting, we can combine them into an ensemble model. By collecting a certain number of decision trees, we can combine them into a common ensemble model - the so-called **random forest** (randomized regression and classification forest). When training this model, initially random samples of data and their characteristics are selected and a set of trees is grown based on them. These are then combined into a single model whereby the output value is determined by the weighted values obtained from each tree. For further information and more details on this approach, we direct the reader to the seminal article by Breiman et al. (2001) on the subject.

Support vector machines are classification models that originate in the field of machine learning (Cortes & Vapnik, 1995). For given classes or sets of observations, they seek to find the optimal classification by calculating the optimal hyperlinearity in the middle of the largest distance between the closest points of the different classes. The boundary points in this space are called support vectors and hence the very name of this family of algorithms. Essentially, the parameters of the this algorithm are evaluated by solving quadratic programming problems. More sophisticated machines with support vectors can design data with finite number of dimensions on higher dimensional planes and classify these planes. For more in-depth discussion, statistical features, and other variants of machines with support vectors, we direct the reader to Hastie et al. (2009).

By leveraging a large number of implementations of these popular types of machine learning algorithms to, as well as adding a set of novel one, this paper aims to further elaborate and significantly expand previous work in forecasting housing prices (Park & Bae, 2015), and thus to bring insight on the optimal modeling strategy for both academics and practitioners.

3. Data, Samples, and Descriptive Statistics

The key business problem we solve is the need to determine and regularly update the correct price of a real estate so that the organization can evaluate the effectiveness of potential disposals with it (purchase, sale, letting, etc.), as well as to predict the future price dynamics in order to minimize the risk of unexpected losses due to adverse trends in the property market. For this task, we use data provided by Yeh & Hsu (2018), with which the authors test an evaluation algorithm they propose – the so-called. a comparative quantitative approach. They (ibid.) compare this new approach with four other alternatives - two approaches for hedonic pricing, a multiple linear regression and a neural network, and find that it leads to better predictive results.

The database itself consists of 414 observations of real estate transactions in Taipei (Taiwan) against seven different characteristics - date, years since the construction of the building, distance to the metro station, number of nearby shops, geographical coordinates (latitude and longitude), unit price area. For convenience of modeling, we divide the date into two components - the year and the order of the transaction within the calendar year (a combination of day and month). The target variable is the price per unit of area and is a continuous numeric variable. For the purposes of estimating the models, we divide the data into two subsets. The training set consists of 80% of the original data and is used for initial estimation of the model, while the testing set (remaining 20%) is used to obtain out-of-sample accuracy metrics as per best practice. This ensures that the models are tested on a different data that they are trained on, and thus mitigates the problem of overfitting and increases the reliability of the reported accuracy numbers.

The main statistics of the data under consideration are presented in Table 1. The average age of traded properties is 17.7 years, and we observe significant differences in this variable. The high standard deviation indicates that there are bot many new and many old buildings. Similarly, the the distance to the nearest metro station is 1084 m. on average, but with a very high standard deviation. There are 4 stores on average around the property, and the average cost per unit area (target variable) is 379,800 new Taiwan dollars per 1 ping. In addition, the data include the exact coordinates of the properties, which give an indication of the neighborhood in which they are located. Additionally, we have information about the time dimension of the transactions - year and sequence (day and month), and these variables allow to take into account the dynamic trend in property prices.

Table no. 1 – Descriptive Statistics for Dataset on Housing Prices, N = 414

Variable	Name in data base	Mean	Std. devi.	Median	Min.	Max.	Skew ness	Kurto-sis
Years since construction	age	17.71	11.39	16.10	0.00	43.80	0.38	-0.89
Distance to metro station, m	distance	1083.8	1262.1	492.23	23.38	6488.0	1.88	3.13
Number of nearby shops	stores	4.09	2.95	4.00	0.00	10.00	0.15	-1.08
Latitude, coord.	lat	24.97	0.01	24.97	24.93	25.01	-0.44	0.24
Longitude, coord.	long	121.53	0.02	121.54	121.47	121.57	-1.21	1.15
Price per unit area	y	37.98	13.61	38.45	7.60	117.50	0.60	2.11
Year of transaction	year	2012.7	0.46	2013	2012.0	2013	-0.85	-1.29
Transaction order	seq	348.38	275.03	333.00	0.25	667.00	-0.07	-1.55

Source: Author calculations based on data by Yeh & Hsu (2018)

The correlation matrix in Figure 1 shows the relationships between the variables under consideration. The price per unit area is very strongly and negatively related to the distance from the metro station, which is a logical and expected result. In addition, there is a negative correlation between the price and the age of the building in which the property is located. We see a well-expected positive correlation with the number of stores as well as the geographical coordinates of the site. Given the positive association between the coordinates and the number of shops, we can conclude that clusters of preferred properties (neighborhoods) are noticeable, which are very close to shopping malls and high-cost residential buildings. The weak positive correlation between the year of the transaction and the price indicates a certain process of rising property prices over time, which should also be taken into account in their modeling.

Figure no. 1 Correlation matrix of data under study

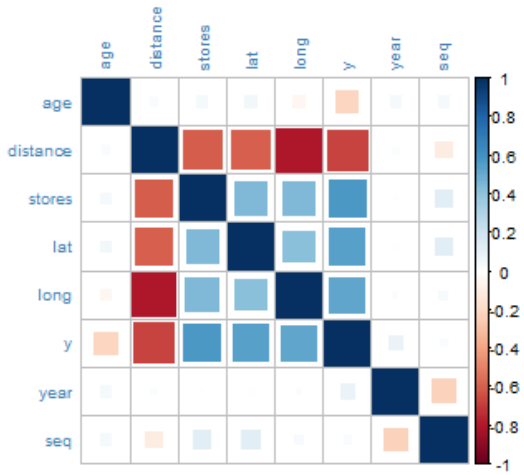
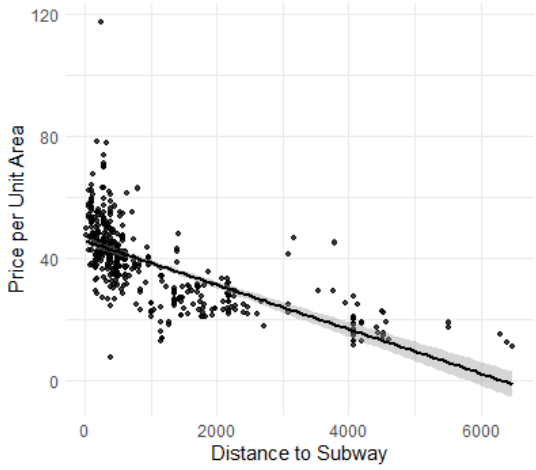


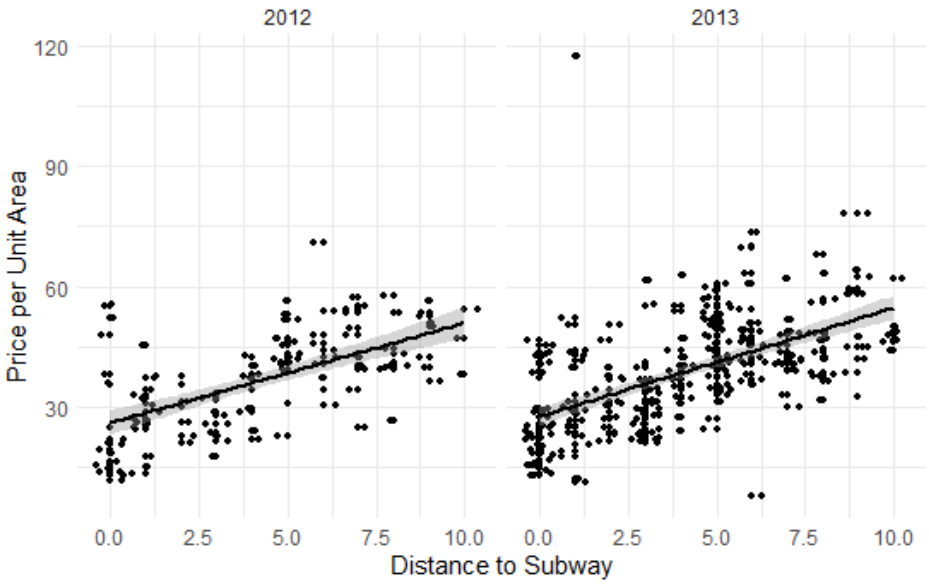
Figure no. 2 Association between Housing Prices and Distance to Subway



The dot plot shown in Figure 2 shows in an even clearer way the relationship between the distance from the transport points (subway) and the price of the property, this relationship being almost linear. However, this should be interpreted with some caution, since the vast majority of the areas in the analyzed database are within one kilometer (1,000 m) of a metro station.

Figure 3 shows the relationship between the price per unit area and the number of shops in the vicinity. We observe a strong positive relationship between the two, and it is valid for the two years for which we have data on transactions. We emphasize that these data allow the training of a forecast model for the price of residential properties, as they include typical features of interest in the formation of prices in this segment - neighborhood (via coordinates), transport connectivity, availability of shops, age of buildings.

Figure no. 3 Association between Housing Prices and Number of Shops in Vicinity across Transaction Years



4. Comparison of Common Approaches

The classical approach for modeling linear relationships in econometrics is by using multiple linear regression. The results of this model are presented in Table 2. All variables considered reach statistical significance at least at the 5% level, with the exception of the longitude and the year of the transaction. The year of construction has a

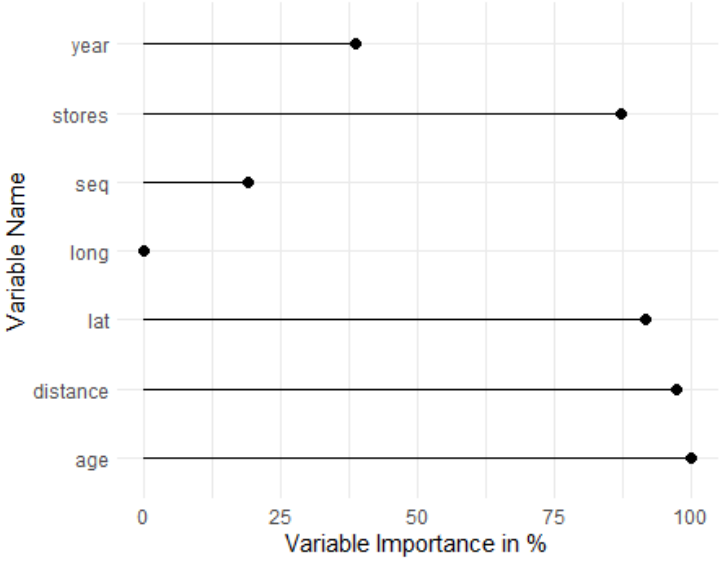
strong negative effect, with each year leading to a reduction in the unit cost of 2,740 new Taiwan dollars. This effect is significant at p <0.005 levels. Surprisingly, although the distance to the metro station reaches statistical significance, the coefficient is negative, which is an unexpected result.

Table no. 2 – Coefficients of Linear Regression on Housing Price Data

Variable	**Variable name in model**	**Coefficient**	**Standard error**	**z-statistic**	**Significance**
Constant	(Intercept)	-5699.739	7337.776	-0.777	0.438
Years since construction	age	-0.274	0.046	-6.005	0.000
Distance to metro station, m	distance	-0.005	0.001	-5.326	0.000
Number of nearby shops	stores	1.208	0.224	5.403	0.000
Latitude, coord.	lat	236.201	51.986	4.544	0.000
Longitude, coord.	long	-32.238	56.126	-0.574	0.566
Year of transaction	year	1.870	1.103	1.695	0.091
Transaction order	seq	-0.004	0.002	-2.193	0.029
		R^2	**0.570**	**Adjusted R^2**	**0.562**

The number of stores within a close radius is clearly one of the most important drives of the unit price. From a statistical point of view, it reaches significance at levels well below 1%, and the high positive coefficient also shows its high practical significance. Increasing the number of nearby stores by 1 increases the price per unit area by 1,208 new Thai dollars. Latitude, but not longitude, is significant, reflecting the direction of development of the city (north-south versus east-west). The last indicator - the order of the transaction - also reaches significance, with an extremely slight fall in prices over the year. The effect is rather small and of little interest in the practical management process. The relative importance of the variables is also shown graphically in Figure 4. Here the importance of the distance to the subway, the number of shops, and the geographical location of the property can be clearly seen. It should be borne in mind that, unlike the regression coefficients, the relative importance of the variables does not allow one to examine the direction of the effect, but only the contribution to the quality of the model.

Figure no. 4 Relative Variable Importance in a Linear Multiple Regression Model



Among the most popular regression algorithms in the field of machine learning that are applicable to this task are the neural network, the kNN algorithm, the random forest, and the support vector machine (for another application see e.g. Gerunov, 2019). Their predictive accuracy is compared with that of the linear regression in Table 3.

Table no. 3 – Descriptive Statistics for Dataset on Housing Prices, N = 414

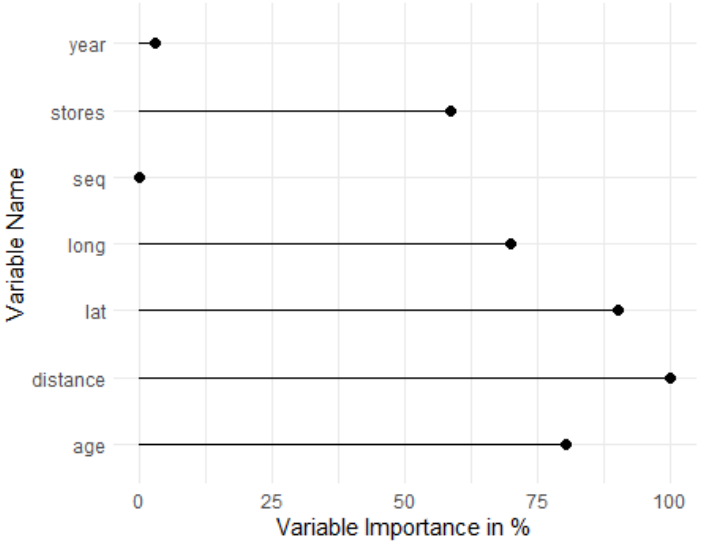
Method	Mean Error, Me	Root Mean Squared Error, RMSE	Mean Absolute Error	Mean Percentage Error, MPE	Mean Absolute Percentage Error, MAPE
Multiple Linear Regression	0.478	8.015	6.065	-2.097	17.004
Neural Network	37.135	39.416	37.135	96.970	96.970
kNN	-0.859	9.521	7.233	-6.509	19.859
Random Forest	-0.768	6.519	4.852	-4.437	13.411
Support Vector Machine	1.864	8.188	6.029	2.008	16.175

Looking at the root mean square error (RMSE) of the forecast, we find that the neural network has by far the lowest performance with RMSE = 39.4, followed by the kNN algorithm (RMSE = 9.5). The linear regression and the support vector machine prove to be good alternatives with almost similar RMSE values. By far the best model is that of a random forest with RMSE = 6.5 and mean absolute error rate MAPE = 13.4. The

average random forest error is -0.77, which shows some underestimation of the realized values. From a practical point of view, the ability to generate area unit estimates with an average RMSE error of only $ 6,519 at an average value of $ 39,780 per unit area represents a significant and meaningful improvement.

The relative importance of the variables in the random forest model is presented in Figure 5, again underlining the importance of distance from a metro station, geographical coordinates and the number of shops in the vicinity. The low importance of the year and the sequence of the transaction reflect the limited influence of the time dynamics from year to year, as well as the lack of a clear seasonality trend in prices.

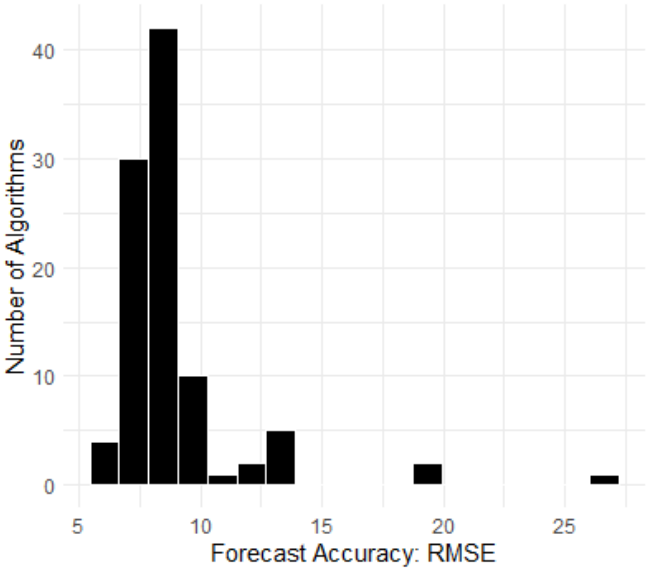
Figure no. 5 Relative Variable Importance in a Random Forest Model



5. Extensive Search for Optimal Algorithms

Using the housing price data, we estimate 106 alternative machine learning models and investigate their predictive accuracy. The full list of algorityms is presented in the Appendix. A histogram of their predictive accuracy with respect to the root of the root mean square errors is presented in Figure 6. The vast majority of methods have register a RMSE in the range of 7 to about 9. The best algorithms among the tested ones have a predictive accuracy of RMSE < 6.5. and those with the worst results can reach an RMSE value of over 25. It is notable that while most algorithms tend to neatly cluster together, there are some extremely poor performers. On the other hand, a few algorithms have markedly better performance than average, thus showing that there is potential business value in selecting and using the best ones.

Figure no. 6 Forecasting Accuracy of Regression Methods under Study



The ten top performers in terms of lowest root mean square error are presented in Table 4. It is immediately apparent that seven of them are different implementations of the random forest family. They all exhibit extremely good predictive accuracy, with their errors in the range of RMSE = 6.46 to RMSE = 7.10. The other three non-random forest algorithms are 2 based on a kernel function and one based on a Gaussian process, whose predictive accuracy is about RMSE = 7.10. Here we also calculate a complexity measure that takes into account the calculation time needed. The most time-intensive algorithm is standardized to a 100%, and the time spent by other is presented as a fraction of that. The best method - that of a regularized random forest is only 35 p. p. faster than the slowest in the sample. On the other hand, the second best - the quantile random forest - is nearly 20 times faster than the most resource-intensive, and the difference in predictive accuracy between the two is almost imperceptible.

Table no. 4 – Forecasting Accuracy of Top 10 Best Performing Methods

Type of Algorithm	**Method**	**Mean Error, Me**	**Root Mean Sqrd. Error, RMSE**	**Mean Abs. Error**	**Complexity Measure**
Regularized Random Forest	RRF	-0.750	6.459	4.831	64.8%
Quantile Random Forest	qrf	0.001	6.470	4.695	5.2%
Regularized Random	RRFglobal	-0.832	6.568	4.890	9.9%

Forest					
Random Forest	ranger	-0.878	6.600	4.884	7.0%
Parallel Random Forest	parRF	-0.936	6.689	4.965	3.8%
Random Forest	ranger	-0.943	6.689	4.908	4.0%
Radial Basis Function Kernel Regularized Least Squares	krlsRadial	-0.435	7.068	5.388	14.8%
Bayesian Additive Regression Trees	bartMachine	-0.795	7.076	5.353	11.1%
Random Forest by Randomization	extraTrees	-0.948	7.081	5.137	7.8%
Gaussian Process with Polynomial Kernel	gausprPoly	-0.501	7.082	5.443	2.1%

This underlines that with this type of task, it is possible to find the optimal point between the benefits and the costs of calculating a given algorithm. Moreover, a fast calculation speed of the algorithm also indicates the possibility of switching from asynchronous to synchronous operations, i.e. from model calculation and subsequent use and future updates to real-time analytics, which is used and trained simultaneously. Thus, algorithms that both a high accuracy and a low complexity value are prime candidates for practical applications in the analytic pipeline.

6. Recommendations and Conclusion

This article aims to outline how novel and advanced machine learning methods can be successfully applied to traditional forecasting problems in economics and business. The particular application under study in forecasting the prices in Taipei's housing market, leveraging the data provided by Yeh & Hsu (2018). We applied both traditional econometric methods, as well as machine learning algorithms such as implementations of neural networks, kNN-type algorithms, Bayesian methods, decision trees and random forests, support vector machines and a host of more exotic approaches. Overall, 107 different statistical algorithms are tested. The main results are clear – the forecasting accuracy of machine learning approaches significantly outperforms that of more traditional econometric tools such as the linear regression. Random forests, in particular, display the best forecasting performance, reflected in their low root mean squared errors.

This leads to a number of recommendations that can inform both the forecasting theory and practice. In terms of research, the application of machine learning algorithms to relevant problems in economics and business seems a fruitful venue for further work. These methods can be leveraged to solve a large number of regression and classification type of problems and are characterized by the fact that they scale well to the constantly increasing amount of available data (so-called big data). Application fields include

financial and business forecasting, demand planning, risk management, credit scoring, customer segmentation, recommendation engines, and others. From a methodological point of view it would be useful to further investigate the performance and stability of those algorithms in particular tasks of interest.

From a practical standpoint, these results can be applied directly for the benefit of businesses with activities in the real estate, facility management, or financing. Real-time price forecasting and re-evaluation effectively provides valuable information that can be fed in organizational decision loops. Apart from improving the internal decision-making, this can also be used for regulatory purposes, especially by financial institutions with large portfolios in real estate. Whatever the sphere of application, the results obtained aim to improve the understanding of how to implement novel machine learning methods to forecasting and thus enable modern organizations to take a further step along the path to comprehensive digital transformation.

REFERENCES

Breiman, L. (2001). Random forests. Machine learning, 45(1), 5-32.

Chen, J. H., Ong, C. F., Zheng, L., & Hsu, S. C. (2017). Forecasting spatial dynamics of the housing market using Support Vector Machine. International Journal of Strategic Property Management, 21(3), 273-283.

Cortes, C. & Vapnik, V. (1995). Support-vector network. Machine Learning, 20, 1-25.

Gerunov, A. (2019). Modelling economic choice under radical uncertainty: machine learning approaches. *International Journal of Business Intelligence and Data Mining*, 14(1/2), 238-253.

Ghorbani, S., & Afgheh, S. M. (2017). Forecasting the House Price for Ahvaz City: the Comparison of the Hedonic and Artificial Neural Network Models. Journal of Urban Economics and Management, 5(19), 29-44.

Hastie, T., Tibshirani, R., & Friedman, J. (2009). The elements of statistical learning: data mining, inference, and prediction. Springer Science & Business Media.

Lim, W. T., Wang, L., Wang, Y., & Chang, Q. (2016, August). Housing price prediction using neural networks. In 2016 12th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD) (pp. 518-522). IEEE.

Park, B., & Bae, J. K. (2015). Using machine learning algorithms for housing price prediction: The case of Fairfax County, Virginia housing data. Expert Systems with Applications, 42(6), 2928-2934.

Peterson, L. E. (2009). K-nearest neighbor. Scholarpedia, 4(2), 1883.

Ripley, B. D., & Hjort, N. L. (1996). Pattern recognition and neural networks. Cambridge university press.

Sirmans, S., Macpherson, D., & Zietz, E. (2005). The composition of hedonic pricing models. Journal of real estate literature, 13(1), 1-44.

Yeh, I. C., & Hsu, T. K. (2018). Building real estate valuation models with comparative approach through case-based reasoning. Applied Soft Computing, 65, 260-271.

APPENDIX

Table no. A1 – Set of Algorithms used for Analysis and Testing

#	Algorithm	#	Algorithm
1	Model Averaged Neural Network	55	Multi-Layer Perceptron
2	Bagged MARS	56	Multi-Layer Perceptron, multiple layers
3	Bagged MARS using gCV Pruning	57	Monotone Multi-Layer Perceptron Neural Network
4	Bayesian Additive Regression Trees	58	Multi-Step Adaptive MCP-Net
5	Bayesian Generalized Linear Model	59	Neural Network
6	Boosted Tree	60	Neural Network
7	The Bayesian lasso	61	Non-Negative Least Squares
8	Bayesian Ridge Regression (Model Averaged)	62	Tree-Based Ensembles
9	Bayesian Ridge Regression	63	Non-Informative Model
10	Bayesian Regularized Neural Networks	64	Parallel Random Forest
11	Boosted Linear Model	65	Neural Networks with Feature Extraction
12	Boosted Tree	66	Principal Component Analysis
13	Conditional Inference Random Forest	67	Penalized Linear Regression
14	Conditional Inference Tree	68	Partial Least Squares
15	Conditional Inference Tree	69	Partial Least Squares Generalized Linear Models
16	Cubist	70	Projection Pursuit Regression
17	Stacked AutoEncoder Deep Neural Network	71	Quantile Random Forest
18	Multivariate Adaptive Regression Spline	72	Quantile Regression Neural Network
19	Elasticnet	73	Ensembles of Generalized Linear Models
20	Tree Models from Genetic Algorithms	74	Random Forest
21	Random Forest by Randomization	75	Radial Basis Function Network
22	Ridge Regression with Variable Selection	76	Relaxed Lasso
23	Generalized Additive Model using LOESS	77	Random Forest
24	Generalized Additive Model using Splines	78	Random Forest Rule-Based Model
25	Gaussian Process	79	Ridge Regression
26	Gaussian Process with Polynomial Kernel	80	Robust Linear Model
27	Gaussian Process with Radial Basis Function Kernel	81	Classification and Regression Trees, CART, ver. 1
28	Stochastic Gradient Boosting	82	Classification and Regression Trees, CART, ver. 2
29	Multivariate Adaptive Regression	83	Classification and Regression Trees,

	Splines		CART, ver. 3
30	Fuzzy Rules via MOGUL	84	Quantile Regression with LASSO penalty
31	Generalized Linear Model	85	Non-Convex Penalized Quantile Regression
32	Negative Binomial Generalized Linear Model	86	Regularized Random Forest
33	Boosted Generalized Linear Model	87	Regularized Random Forest
34	glmnet	88	Relevance Vector Machines with Radial Basis Function Kernel
35	Generalized Linear Model with Stepwise Feature Selection	89	Subtractive Clustering and Fuzzy c-Means Rules
36	Hybrid Neural Fuzzy Inference System	90	Partial Least Squares
37	Independent Component Regression	91	Spike and Slab Regression
38	Partial Least Squares	92	Sparse Partial Least Squares
39	k-Nearest Neighbors	93	Supervised Principal Component Analysis
40	k-Nearest Neighbors	94	Support Vector Machines with Linear Kernel
41	Polynomial Kernel Regularized Least Squares	95	Support Vector Machines with Linear Kernel
42	Radial Basis Function Kernel Regularized Least Squares	96	L2 Regularized Support Vector Machine (dual) with Linear Kernel
43	Least Angle Regression	97	Support Vector Machines with Polynomial Kernel
44	Least Angle Regression	98	Support Vector Machines with Radial Basis Function Kernel
45	The lasso	99	Support Vector Machines with Radial Basis Function Kernel
46	Linear Regression with Backwards Selection	100	Support Vector Machines with Radial Basis Function Kernel
47	Linear Regression with Forward Selection	101	Bagged CART
48	Linear Regression with Stepwise Selection	102	Partial Least Squares
49	Linear Regression	103	Wang and Mendel Fuzzy Rules
50	Linear Regression with Stepwise Selection	104	eXtreme Gradient Boosting
51	Model Tree	105	eXtreme Gradient Boosting
52	Model Rules	106	eXtreme Gradient Boosting
53	Multi-Layer Perceptron	107	Self-Organizing Maps
54	Multi-Layer Perceptron, with multiple layers		

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APPLICATION OF BLOCKCHAIN AND ARTIFICIAL INTELLIGENCE IN BANK RISK MANAGEMENT

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Abstract

The transformation from analogue to digital risk management is becoming a prerequisite in the implementation of the incresingly digital bank institutions' strategies. Among the key steps in this direction is the optimal use of blockchain technology's potential and artificial intelligence. Huge hopes are set on blockchain in view of two key risks facing today's banks: the danger of using the bank system for money laundering and financing terrorism, and cyberattack threat. Artificial intelligence, in turn, creates conditions for processing large arrays of unstructured data risk, more precise identification of potential problems in the future, full automation of manual processes in risk function, credit scoring automation, developing adequate market risk assessment models, etc.

Keywords: *banks, blockchain, artificial intelligence, digitalization, risk management*
JEL Codes: *G210*

1. Introduction

Increasingly, specialized financial literature has been quoting Bill Gates's words: "We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don't let yourself be lulled into inaction." The famous quote is an excellent illustration of the banking industry's current situation. Although they appeared only a decade ago, digital innovations, with blockchain technology, artificial intelligence, business process automation, cloud technologies, augmented reality and other among them, are today a part of the sector's mainstream. Without a shadow of doubt, the simultaneous fundamental transformation of both technology and philosophy of banking leaves a striking impact on each element of credit institutions value change. Viewed from this background, the issue of how these processes reflect upon a risk management that was badly compromised by the financial crisis, evokes a serious research interest.

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It is a fact that for a while digitalization mostly focused on the "customer journey" and its associated processes and operations – marketing, onboarding, service, etc. Later, however, transformations gradually spread to other parts of the organizational structure chain, reaching the risk function as well. But this is not all. With the acceleration of technological innovations and changes, it will most probably be the risk function that will have to develop multiple models and policies to support automated decisions and real-time answers in other parts of the business. Thus, having in mind its inherent simultaneous proximity and connectedness to higher management, the regulatory compliance function and client-orientated organizational units, risk needs to not just adopt and master new technologies, but speed up their implementation, thus turning into "a digital transformation pioneer". Moreover, although the range of digital facilities for risk management in banking is huge, most experts seem to reach a consensus, claiming that the largest and most outstanding potential for risk management transformation is that of blockchain technology and artificial intelligence.

2. Blockchain technology in risk management context

The buzz and euphoria around bitcoin, and other cryptocurrencies that followed, have turned blockchain into one of the most widely commented topics over the last decade. In its most general sense, blockchain technology (BT) is designed to create public records of digital data within the so called distributed ledger (DL) [1]. Each record in the network possesses a unique identification number (hash code) and is also protected by encryption. What is specific in this case is that information is stored on multiple independent computers and servers (called "nodes"), which makes the system fully decentralized. In other words, you do not need a central server to guarantee record authenticity. Instead, control is exercised by individual users, as each of them has a copy of the entire database. Another important peculiarity is s that each change in the system only takes place after a consensus about it (an approval) has been reached by all participants or at least by a certain number of participants."In addition, the distributed ledger also stores transaction chronologies, not just end results (for example, current balances), which protects the system against manipulation and data falsification" (Petrov, 2018, p. 25). Finally, despite its "open" nature, blockchain ensures confidentiality of information. This is so, because encryption by means of complicated techniques guarantees that customers have control over their confidential information and can decide for themselves which third parties should gain access to it by providing a key.

It has rapidly become clear that the possibilities for applying this new technologies far exceed the creation of cryptocurrencies. In view of the revolutionary changes in transaction execution that blockchain "promised", there soon followed accusations that blockchain is nothing but the banking industry's biggest enemy. However, once the initial surge of justified skepticism and anticipated resistance was overcome, at present

banks increasingly "reach for" blockchain in an attempt to take the biggest possible advantage for their business [2].

A survey of 1520 respondents from the financial industry reveals that, according to their expectations, improved risk management (40%) will be the most substantial benefit from BT application, ranking third after better data management (47%) and increased transparency (46%). Following are accelerated digitalization, process rationalization and process automation, cost effectiveness, better security and other (Cognizant, 2019, p. 8). Another survey points out risk reduction, cost cutting and improved effectiveness as the most significant advantages of the financial industry using the so called "smart" contracts (Capgemini, 2016, p. 7) [3].

Where in particular can we look for possibilities to apply blockchain in risk management? Research brings forward the following areas where this new technology can be of use: risk monitoring and risk auditing, taking justified risks, counteragent risk management, fraud risk management (including identity theft prevention), liquidity, capital, system and operational risk management (Infosys, 2019, p. 4). In most of theses areas, however, currently there is a lack of research aiming to measure the real effects of BT implementation. In this sense, expected benefits are rather hypothetical. Nevertheless, in certain spheres affecting risk management, banks are already actively testing blockchain potential.

Thus great hopes are set upon blockchain technology to reduce the risk of using the banking system for money laundering and terrorism financing. In a more narrow aspect, according to research, it has considerable potential for optimizing the execution of "Know your customer" (KYC) procedures [3]. The fact is, banks are currently facing serious difficulties in this area. Their efforts in view of the initial identification of a prospective client's profile frequently result in awkward, cumbersome and ineffective onboarding processes [4]. In addition, many customers are disappointed with the large volume of confidential information their bank partners require. Banks are also increasingly worried by the growing Compliance costs that accompany KYC regulations. Last, but not least, as the requirements for investigating customers are much too complex and subject to various interpretations, compliance often becomes an overwhelming task (Carmichael, 2018, p. 1).

The abilities of blockchain technology to overcome these challenges are assessed in view of the key characteristics of the said technology. Thus, for example, when a customer presents information to a particular bank that belongs to a blockchain-based KYC platform, data are also replicated to all the other creditors participating in the platform [5]. On this basis, the key benefit for banks is cost cutting and shortening the time for collecting, validating, storing and moving information. Therefore, institutions with long-standing connections with a given customer, will considerably facilitate this customer's initial identification in another institution, eliminating time-consuming and annoying manual checks (for instance verifying the authenticity of the copies of personal

documents presented) (Thomson Reuters, 2018, p. 6). This will also greatly contribute to increasing customer satisfaction, as it will no longer be necessary to provide the same information again and again. Apart from everything else, simplification of onboarding processes could lead to a quicker access to new customers and better customer relations management, which in turn could save banks more time and resources (Carmichael, 2018, p. 5).

As for the follow-up monitoring, the unique identifier allows credit institutions within the network to automatically receive updates on customer information and their risk exposure (Thomson Reuters, 2018, p. 7). This automation, combined with higher transparency and more comprehensive customer information, will reduce credit risk (counteragent risk). In addition, the number of transactions wrongly considered suspicious will reduce, and, respectively, the need for manual interference will be limited. According to even braver forecasts, in this aspect blockchain technology can help for reducing the number of employees by 30%, which in turn could ensure around $1.4 bn cost economies for banks (Goldman Sachs, 2016, p. 75).

Distributed digital ledgers will also contribute to compliance-risk minimization, as all transactions referring to a particular customer can be automatically followed and, consequently, this information can be used as evidence that the bank has acted in compliance with the requirements of the AML- legislation. Thus, over time, the fact that customer information is becoming easier to verify, could potentially reduce the fines imposed upon financial institutions (Goldman Sachs, 2016, p. 74).

Against this background we can conclude that from the KYC process view point, blockchain technology is able to stand as a solid foundation for a secure, effective and decentralized platform for collecting, validating and sharing the necessary customer information. Summarized, its advantages appear to be as follows: possibility for sharing insider negative customer information, generated by individual financial institutions; verification of information arrays (array integrity checking, deleting superfluous records, adding data); forming a more-realistic idea of the customer risk profile (by discovering relationships with other risky persons, which had remained undetected by conventional software); better monitoring opportunity (as a change in customer risk profile is recorded by even a single financial institution in the network, owing to blockchain, this change becomes automatically visible to all participants)“ (Valkanov, 2019a, p. 211-212).

From the point of risk management, another important advantage of a blockchain network is its “genetically inherent” resilience to cyberattacks. Though not “immune” against all forms of cyber risk, blockchain’s unique structure provides certain protection mechanisms which are not inherent to conventional IT systems and technologies (English, Kim & Nonaka, 2018, p. 11-12):

To begin with, blockchain’s decentralized and distributed structure is an advantage that can deter cybercrime or at least minimize its negative impact. This is so, because hackers typically target their attacks at a centralized data base, which, once hacked,

infects and destabilizes the whole system. In contrast, here an attack against one or a few participants in the system cannot in any way pose a risk to the ledger stored in the nodes, which were not attacked. In this sense, the distributed network structure could ensure a higher operational resistance for the bank. Moreover, even if there were a real attack, the system's distributed character can facilitate data- and- process restoration (assuming that not all nodes are simultaneously damaged). In turn, this possibility will reduce the need for costly restoration plans (European Investment Bank, 2019, p. 28).

Secondly, the consensus mechanism that is fundamental to blockchain requires that a certain number of participants reach consensus about whether the newly created data block is valid and fit to be included in the joint ledger, as well as whether the ledger itself, with all its history corresponds to the network validation rules. In this sense hackers will have to "beat" the consensus mechanism, by manipulating a sufficient number of nodes in the network and thus forge the ledger. However, blockchain can easily compromise the success of such an attack, if the network contains a sufficient number of nodes and transaction validation calls for a considerable degree of consensus among them.

Thirdly, blockchain technology makes use of various forms of encryption in various points, thus providing a multi-layer protection against cybersecurity threats.

In the fourth place, blockchain network transparency also provides protection against virtual attacks, creating a serious difficulty for hackers to implement unnoticed malware to collect information and transfer it to another database (managed by them). The reason is that every participant has at their disposal an identical copy of the ledger, which is a prerequisite for considerably easier record tracking. In this sense any deviations from the system's normal rhythm (for example, those caused by malware installed) can be quickly identified. In addition, information gained from such an event can be "implanted" in conventional security devices, such as Firewalls and Intrusion detection system, with which cybersecurity could be improved in the future (Deloitte, 2016a, p. 14).

Fifth, blockchains are often hosted on cloud platforms that have solid cybersecurity controls. Cloud computations offer participants an easily accessible and sustainable platform, which results into a shorter stay in the system, less transaction loss risk, and lower likelihood of not reaching consensus.

3. The possibilities of artificial intelligence

Artificial intelligence in its various forms and performance has been gaining popularity with banks [6]. Defined as "a comprehensive term referring to the capabilities of a machine to perform cognitive functions associated with the human mind, including perception, reasoning, learning, interaction with the environment, problem-solving and

even creativity", there are dozens of smart technologies and activities that are associated with AI. The more important of these are:

- predictive analytics;
- machine learning, ML;
- robotic process automation, RPA;
- artificial neural networks;
- natural language processing, NLP;
- computer vision and other.

A survey among over 2000 respondents from the financial industry at the end of 2018 finds out these AI technologies are mostly applied in the following spheres: automation of manual processes, credit scoring, data cleaning and improvement, risk ranking, model validation and model calibration. According to authors, survey results definitely confirm financial institutions' ever stronger interest in artificial intelligence and mainly in its abilities to optimize risk functions (GARP, 2019, p. 3-7). This is hardly surprising given the forecasts that this new technology's application in risk management will save banks $ 31bn by 2030 (Ginimachine, 2018).

More particularly, the benefits of applying artificial intelligence for the purposes of bank risk management are incomparable. The enormous computing power it offers allows for the processing of large arrays of information in a short time, and more importantly, the abilities of advanced analytics algorithms to retrieve much more meaningful and usefulin formation out of the "ocean" of *unstructured data* [7]. In parallel, its capacity for decision-making, based on complicated statistical methods, instead of clearly pre-defined rules, creates prerequisites for avoiding incorrect risk forecasts, often followed by billions in losses for credit institutions.Against this background, robotic process automation, machine learning and natural language processing have the potential to improve effectiveness in a number of processes, among them approval and loan granting, risk aggregation, assessment of varios risk factors impact upon the formation and allocation of profits, losses, etc. In addition, these new algorithms ensure end-to-end transparency, i.e. at any given moment it will be clear whois responsible at the concrete stage of the processes of identification, assessment and various type of risk management.

Smart platforms and applications can perform precise and timely assessment of risks emerged in previous periods and on that basis identify early symptoms of potential future problems and threats, Therefore, owing to the more realistic scenarios drawn up, other key issues in risk management will be improved, such as stress- tests and "What if" type of analyses (Genpact, 2018, p. 8). No less important is the role of artificial intelligence in fraudulent practices identification and prevention. The fact is banks already use specially programmed systems (for instance, to identify credit card fraud), whose basic task is to block doubtful transactions. The future, however, promises a considerable expansion of this potential, as with time, in the process of self-learning, technologies will get smarter and smarter and will be able to detect and prevent

increasingly more sophisticated fraudulent schemes - an advantage, which according to research, is likely to have the biggest impact on risk management in the foreseeable future [8].

Compliance risk management will also be simplified due to the intelligent workstations, which consolidate contact points, direct queries to the experts in charge and increase transparency and access (BCG, 2019). Something more, especially in the field of compliance, new technologies give financial institution unload to some degree by the burdensome regulatory costs imposed by fast changing regulatory framework (Valkanov, 2019b, p. 28). Another circumstance not to be ignored is that artificial intelligence – based technologies overcome various kinds of bias and subjectivity pertaining to humans. This advantage is particularly valuable from the standpoint of the lessons learned during the global financial crisis, which revealed that more often than not, bank problems result from intentional disregard for risk rules and limits on the part of executives and employees in charge [9]. Artificial intelligence benefits can also be sought in terms of image. The ever more active implementation of such technologies and platforms in risk management could be interpreted by the public as a sign of the particular bank's reliability and security as an institution that effectively and appropriately manages its risks. Besides, customers will be aware that the bank is willing to transform and has the necessary capacity to fight the competition of emerging hich-tech financial companies (neobanks, FinTech companies, etc). This is a particularly crucial point for the new high-tech generations.

Next, artificial intelligence offers a large number of new possibilities for the *automation* many manual and standardized processes in all categories of risk management, and in particular for the so called Robotic process automation (RPA). Tracking risk limit breach, risk data quality assessment and reporting documents preparation are but a few of the examples in this area. Among the most significant benefits of risk management automation there stand out saving time, reduced need for manual interference, fewer mistakes, compliance costs reduction, risk reports generation in (almost) real time, better control over processes, maintaining the operational flexibility necessary and improving system effectiveness. In addition, the development of automated models allows risk teams to test a large amount of output data by parallel simulations, choose the most accurate ones and use the time saved to solve other important business problems (BCG, 2019) [10].

RPA technology is considered particularly useful for minimizing exponentially growing compliance risk. Thus, for example, a global British bank reports that in the recent past it took considerable resources to manually track regulatory changes in over 300 websites a day and their subsequent input in risk and compliance models. A typical employee used 15% of their time on similar activities. At the present stage, the larger part of these manual activities are automated with the help of software robots, The bank can now quickly and effectively "catch" various regulatory information from multiple public

websites – from stock exchanges (NYSE, Euronext) to the Federal regulatory agencies (Kofax, 2018, p. 10). Robots work alongside bank employees to perform their basic task – follow various sites – from stock exchanges to federal regulatory agencies. From the point of view of compliance risk there are other benefits of RPA that should not be underrated: coordination between risk management teams and those engaged in compliance with regulations, avoiding fines and reputational damages; providing comprehensive and accurate information for auditors.

The application of artificial intelligence in risk management also has the potential to contribute to building interactive and personalized platforms and augmented reality interfaces for the customer. Intelligent vision technologies allow users a more intutitive access to smart business applications and solutions, with which to better understand their costs and financing capacity.In mobile applications and bank websites, for instance, users could view their cost history and other information intuitively, without having to accumulate it by analysis of various invoices and receipts and without having to formulate a vision of their own cost models by themselves.

It is also crystal clear that transparency and argumentation of the decision made about the customer risk profile (for instance, why they have been refused a loan) are key factors for customer satisfaction. With the help of artificial intelligence banks could equip their interfaces with functionalities allowing customers to change the parameters of the serveices they use (for instance, set different loan amounts) and trace in real time the direct consequences of these changes. One of the most advanced vision technologies, which can enhance customer experience, is Augmented Reality, where information is "digitally overlaid" on real environment. This can mean, for instance, that customers receive risk-related information as overlays upon objects they wish to purchase. Thus, in case of mortgages, or automobile loans, customers will receive information about their available funds, about how the amount suggested can be used for other portfolio positions, about the most appropriate maturity date, about amounts of potential credit and other (IIF, McKinsey, 2017, p. 50-52).

Let us now discuss the application of AI algorithms in the management of certain risk categories that are of key importance for banks. All analysts agree that credit risk managemnt is the area that will most benefit from artificial ntelligence. Apart from providing a faster assessment of the potential borrower at a lower cost, the credit scoring performed by intelligent machines is based on more sophisticated rules and algorithms compared to to those employed in the conventional credit scoring models. Although at present a potential borrower check can also be performed in more or less real time, the data it is based on are periodically (usually monthly) updated. But in the era of open banking and Big Data this definitely doesn't seem enough. It is exactly here that a machine learning platform can momentarily draw information from various sources at the same time – for example, other suppliers of financial and non- financial services, public registers, social networks, etc. and make a decision based on real- time customer data

[11]. On this ground the system can determine the suitable product for the customer according to the prosspoint between customer's risk profile and the bank's risk appetite.

In the end, the more accurate, faster and cheaper customer segmentation according to their credit quality will result in a shorter credit decision making process. Applying machine learning algorithms in credit scoring may also bring about greater access to credit. Under conventional assessment model, in use on most markets, a potential borrower must possess enough information on their credit history that can be assessed. Should such information be missing, no credit rating can be generated and prospective credit-worthy borrowers are often not granted a loan and thus a chance to form their own credit history. By using altenative data sources and applying machine learning algorithms this problem should be solved (FSB, 2017, p. 12). In turn, natural language processing technology could recognize any suspicious data received when the application form was submitted, and biometric technologies could identify malware. Thus artificial intelligence suggests a potential to save millions in "fraudulent or bad" credit applications and at the same time ensures that good credit quality customers will get the best product possible under their own circumstances and in a perfectly clear application process (Accenture, 2018, p. 17). According to McKinsey's study, in addition, better credit models can improve bank return in four ways: higher interest revenue from the credit business; improved risk monitoring; lower operating and sales costs; higher effectiveness and higher return on capital (McKinsey, 2017).

Some analysts believe that AI also offers numerous possibilities for operational risk management. One of these is risk event classification. A computer algorithm, for example, can read risk specifications, written by risk managers, and group and rank them according to their impact and frequency. Combining historical loss data with risk reports can lead to a more accurate future loss forecasting (Consultancy.ey, 2019). Financial institutions can also use automated smart systems to observe their employees (traders), by linking purely trade information with other behavioural data, such as e-mail messages, events in the calendar, the time one arrives and leaves the office building and even telephone calls. Artificial intelligence-based analytics platforms can also manage suppliers risk by integrating various information about them – from their geographical and geopolitical environment to their financial risk, sustainability and corporate social responsibility, Artificial intelligence systems can also be taught to detect, track and repel cyberattacks. In particular, they will be able to identify software with certain distinctive features (for instance, with an ability to consume a large amount of processing power or forward too many data) and then block the attack (Boillet, 2018).

As for market risk, machine learning has considerable potential in all stages of the development of an adequate market risk assessment model.Thus, during the preparation of the set of data that is necessary for modelling, ML-techniques can be used for retrieving and cleansing of relevant macroeconomic variables or historical data on key trading tools. When choosing a particular model methodology the focus is on using

machine learning algorithms for improving forecast accuracy or on developing trade strategies for tfinancial markets. ML-techniques can also be applied in the stage of final model testing and model validation, for example, for defining the suitable threshholds and benchmark indicators necessary for monitoring model effectiveness (Kumar, 2018, p. 3-4) [12].

In view of what has been discussed so far, according to some predictions, the increasingly wider proliferation of artificial intelligence within the risk function will probably go through three stages. Initially it will be used for accumulating valuable data that are necessary for the deeper understanding of risks and threats, which in turn will enable a more informed decision-making. The second stage will include AI application in monitoring and risk supervision aimed at providing standards and controls, under which risk activities may be performed. In parallel, this will provide an opportunity to study certain specific cases of risk taking, so as to guarantee these cases match the established frameworks and standards. Having reached maturity, artificial intelligence is highly likely to to be actively used for the provision of an independent standpoint concerning key risk decisions and an independent challenging the decisions made by the first line of protection (business units). In short, at present AI can provide information to assist risk managers; with time it will gradually develop, evolving to a programming algorithm for low class decision-makung, and at a later stage to advanced applications for performing independent checks on processes (Jogi, 2018).

4. Conclusion

Blockchain and artificial intelligence are two of the technologies that have the potential to fundamentally transform banking risk management. Their application can provide benefits to credit institutions in a number of areas: Big Data processing, customer segmentation, credit scoring, fraud prevention, regulatory compliance, risk modeling, cybersecurity, AML processes, market risk forecasting, etc. However, in order to make the most of this potential, banks must not only "equip" themselves with good IT professionals, infrastructures and systems, but also implement these new technologies at the heart of their risk strategies and policies. It also requires a radical change in the thinking and behavior of banking risk management.

ENDNOTES

[1] The terms “blockchain“ and “distributed ledger technology“ (DLT) are frequently used as interchangeable, but the fact is there is considerable difference between them. DLT is a “family” of technologies which use distributed database architecture with the aim of supporting multiple identical copies of a verifiable, distributed or decentralized transaction and data register. Blockchain is a specific type of DLT and

a method of organizing data into aggregated ordered blocks which are "tied together" by means of cryptographic hash function (English et al., 2018, p. 6).

[2] Thus at the end of 2018 it became clear that more than 75 of the world's largest banks will participate in the initiative Interbank Information Network (IIN) – the largest blockchain payment application to be used by the regulated banking industry so far. The aim of this common and distributed ledger, which all the banks will have access to, is for banks to be able in real time to solve problems such as Compliance-checks, missing information, wrong addresses,etc., which at present frequently result in delaying transactions for days and weeks (Noonan, 2018). In the middle of 2019 information appeared stating that 14 of the global banking institutions, UBS, Credit Suisse, Barclays, MUFG Bank among them, have invested $ 63 m in the creation of a BT- based crypto-token - Utility Settlement Coin (USC), which should facilitate and accelerate cross-border payments. In this sense USC does not aim to be the next decentralized cryptocurrency, but would rather function as an instrument for improving bank effectiveness (Pollock, 2019).

[3] With the coming into force of the Directive on the prevention of the use of the financial system for money laundering and terrorist financing in 2017, banks are already obliged to have a developed Know Your Customer (KYC) policy. According to regulatory requirements, they have to prepare a detailed risk profile of each potential customer and determine the risk category these customers fall in. It is also necessary for banks, during the process of servicing the customer, to gather current client information concerning client habitual activity, so as to be able to identify suspicious operations, which go beyond the framework of the customer profile built. In particular, the basic elements the KYC process should contain are as follows: customer approval policy, customer identification procedures, transaction monitoring, risk management.

[4] According to computations, due diligence-practices, applied in order to comply with the regulatory requirements concerning KYC procedures, are presently taking 24 days on average. In certain cases this serious delay can lead to a $25000 potential revenue loss from a single customer, as a result of the impossibility to carry out a cross sale, for example (Cognizant, 2019, p. 9).

[5] But although information storage is essentially decentralized, another bank will not have access to it (in fact, it will not even know such information exists), unless it is explicitly authorized by the customer in the form of a decryption key. Besides, reliable tracing the separate "blocks in the chain" allows customers to find out which banks have gained access to their information. Therefore, blockchain practically creates a personal data confidentiality model, whereby the customer retains full control over them.

[6] According to a forecast by the American market research consultants International Data Corporation, in 2019 banks will invest $ 5,6 bn in the introduction of AI-based

decisions. Globally in this field they will come second only to retailers with investments of $ 5,9 bn, but Western Europe will retain the leading position in the field (IDC, 2019).

[7] In other words, artificial intelligence and risk management are in perfect partnership when there is a need for unstructured data processing and evaluation. For this reason, in view of expert prognoses that "by 2025 over 80% of the world's data will be unstructured" (Capgemini, 2018), the incredible potential of AI shows through, even if we only consider the above example.

[8] At present the most widely applied method for identifying fraud is using computers to compare a particular set of structured data against a set of banking rules and limitations, for example, a maximum threshold of $10000 is set for electronic transfers and every transaction worth above the said sum is marked by the computer as suspicious and is liable to further investigation. The problem here is that this type of structured data analysis often generates too many false positive results, which entails many hours of painstaking investigation. Now, with the help of cognitive analyses fraud identifying models can become much more secure and accurate. "If a cognitive system identifies a certain transaction as potential fraud, but a human later finds out this is not the case, the computer learns from human insight and will not make the same mistake again, In other words, the computer becomes ever more intelligent. This is an enormous change in the "rules of the game", as in this way new technologies can help identify emerging behavioural models and original fraudulent schemes, which could never be detected by humans" (Deloitte, 2016b, p. 2-3).

[9] Of course, we should not underestimate other opinions, claiming that machines assess reality the same way humans do: by seeing many cases from the reality and adjusting their behavior according to predictions and past experience. In this aspect, they, too, can be viewed as biased and unobjective.

[10] Banks that are more advanced in implementing automation declare that their projects performed 70 to 80% more effectively in manual, repetitive tasks (such as an automated system for tracking collaterals, detecting and cleansing data anomalies, etc) (IIF, Ernst & Young, 2018, p. 23).

[11] In addition to everything else, the computer processing of this new data constellation provides an opportunity to augment customer risk profile with certain qualitative factors such as consumer behavior and willingness to pay (FSB, 2017, p. 12).

[12] An interesting example of using machine learning in developing a model for market risk assessment can be seen in the activities of the French investment intermediary Nataxis, which, in verifying their model uses unsupervised learning algorithms. While this algorithm was being tested, every night these algorithms performed over 3 million calculations, aiming to establish new types of links between the assets traded on the market and the identification of the anomalies in the forecasts the company produced. Thus, identifying wrong results in the stress tests used, ML-algorithms turn

into a valuable instrument for monitoring, validation and correction of the investmen intermediary's current stress tests and trading models (Woodall, 2017).

REFERENCES

Accenture (2018). *Redefine Banking with Arteficial Intelligence*, https://www.accenture.com/_acnmedia/pdf-68/accenture-redefine-banking.pdf.

BCG (2019). *Global Risk 2019: Creating a More Digital, Resilient Bank*, https://www.bcg.com/publications/2019/global-risk-creating-digital-resilient-bank.aspx.

Boillet (2018). *Why AI is both a risk and a way to manage risk*, https://www.ey.com/en_gl/assurance/why-ai-is-both-a-risk-and-a-way-to-manage-risk.

Capgemini (2016). *Smart Contracts in Financial Services: Getting from Hype to Reality*, https://www.capgemini.com/consulting-de/wp-content/uploads/sites/32/2017/08/smart_contracts_paper_long_0.pdf.

Capgemini (2018). *Organizations need to give unstructured data its rightful place if they want to get value out of data*, https://www.capgemini.com/2018/08/reorganizing-unstructured-data/.

Carmichael, A. (2018). *INSIGHT: Blockchain Helps Banks Streamline Know Your Customer Processes*, https://application-production.cdn.ranenetwork.com/blog/wp-content/uploads/2018/08/02160355/Blockchain-Helps-Banks-Streamline-Know-Your-Customer-Processes.pdf.

Cognizant (2017). *Financial Services: Building Blockchain One Block at a Time*, https://www.cognizant.com/whitepapers/financial-services-building-blockchain-one-block-at-a-time-codex2742.pdf.

Consultancy.eu (2019). *AI can improve operational risk management in banking*, https://www.consultancy.eu/news/2571/ai-can-improve-operational-risk-management-in-banking.

Deloitte (2016a). *Taking cyber risk management to the next level*, https://www2.deloitte.com/tr/en/pages/risk/articles/cyber-risk-management-financial-services-industry.html.

Deloitte (2016b). *Why artificial intelligence is a game changer for risk management*, https://www2.deloitte.com/content/dam/Deloitte/us/Documents/audit/us-ai-risk-powers-performance.pdf.

English, E., Kim, A.D. & Nonaka, M. (2018). *Advancing Blockchain Cybersecurity: Technical and Policy Considerations for the Financial Services Industry*.

European Investment Bank (2019). *Blockchain, FinTechs and their relevance for international financial institutions*, https://www.eib.org/attachments/efs/economics_working_paper_2019_01_en.pdf.

FSB (2017). *Artificial intelligence and machine learning in financial services: Market developments and financial stability implications*, https://www.fsb.org/wp-content/uploads/P011117.pdf.

GARP (2019). *Artificial intelligence in banking and risk management: Keeping Pace and Reaping Benefits in a New Age of Analytics*, https://www.sas.com/content/dam/SAS/documents/marketing-whitepapers-ebooks/third-party-whitepapers/en/artificial-intelligence-banking-risk-management-110277.pdf.

Genpact (2018). *Transforming strategic risk management to realize competitive advantage: Genpact/ERMC FS Risk Management Survey*, https://www.genpact.com/ downloadable-content/insight/transforming-strategic-risk-management-to-realize-competitive -advantage.pdf.

Ginimachine (2018). *Banking Today: Risk Management with AI*, https://ginimachine.com/blog/banking-today-risk-management-with-ai/.

Goldman Sachs (2016). *Profiles in Innovation: Blockchain*, https://www.finyear.com/attachment/690548/.

IDC (2019). *Worldwide Spending on Artificial Intelligence Systems Will Grow to Nearly $35.8 Billion in 2019*, https://www.idc.com/getdoc.jsp?containerId=prUS44911419.

IIF, Ernst&Young (2018). *Accelerating digital transformation: Four imperatives for risk management*, https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/banking-and-capital-markets/ey-ninth-annual-iif-bank-risk-survey-accelerating-digital-transformation.pdf.

IIF, McKinsey (2017). *The future of risk management in the digital era*, https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/Risk/Our%20Insights/The%20future%20of%20risk%20management%20in%20the%20digital%20era/Future-of-risk-management-in-the-digital-era-IIF-and-McKinsey.ashx.

Infosys (2019). *Blockchain adoption in financial services*, https://www.infosys.com/industries/financial-services/white-papers/Documents/blockchain-adoption-financial-services.pdf.

Jogi (2018). *Artificial Intelligence Reshaping Risk Management In The BFSI Sector*, https://www.expresscomputer.in/artificial-intelligence-ai/artificial-intelligence-reshaping-risk-management-in-the-bfsi-sector/30773/.

Kofax (2018). *Forecasting your future: How Financial Institutions Are Improving Operations*, https://badr.blog/wp-content/uploads/2018/09/kofax-kapow-how-financial-institutions-are-improving-operations-with-rpa-ebook.pdf.

Kumar (2018). *Machine Learning for Model Development in Market Risk*.

McKinsey Analytics. An executive's guide to AI, https://www.mckinsey.com/ business-functions/mckinsey-analytics/our-insights/an-executives-guide-to-ai.

Morrison, A. (2016). *How smart contracts automate digital business*, https://usblogs.pwc.com/emerging-technology/how-smart-contracts-automate-digital-business/.

Noonan, L. (2018). *JPMorgan widens blockchain payments to more than 75 banks*, https://www.ft.com/content/41bb140e-bc53-11e8-94b2-17176fbf93f5.

Petrov, D. (2018). *Application of Blockchain and Smart Contracts in the Financial Industry (In Bulgarian)*. Izvestia - Journal of the Union of scientists – Varna, Economic sciences series, vol.7, №2, pp. 24 - 33.

Pollock, D. (2019). *World's Biggest Banks Splash $63 million on a Blockchain Digital Currency*, https://www.ccn.com/biggest-banks-63-million-blockchain-digital-currency/.

Thomson Reuters (2018). *A Blockchain Enabled KYC Solution: New Horizon or False Dawn?*, https://www.refinitiv.com/content/dam/marketing/en_us/documents/white-papers/kyc-blockchain-white-paper.pdf.

Valkanov, N. (2019a). *Compliance v pomosht na finansovoto regulirane (in Bulgarian)*. Varna: Science and Economy, Library "Prof. Ts. Kalyandziev", Book 59, 335 p., ISBN 978-954- 21-0994-5.

Valkanov, N. (2019b). *Mitigation of regulations burden in financial sector by application of high tech solutions*. Journal for Economics and Management science of Faculty of Economics – South-Western University – Blagoevgrad, Volume: XVI, Issue: 1, Year: 2019, pp. 19-30. ISSN: 2367-7600; 1312-594X, http://em.swu.bg/images/SpisanieIkonomikaupload/Spisanieikonomika2019/MITIGATION%20OF%20REGULATIONS%20BURDEN%20IN%20FINANCIAL%20SECTOR.pdf.

Woodall, L. (2017). *Model risk managers eye benefits of machine learning*, https://www.risk.net/risk-management/4646956/model-risk-managers-eye-benefits-of-machine-learning.

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THE DEBT OF MUNICIPALITIES IN BULGARIA - THREAT OR OPPORTUNITY

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Abstract

In times of high liquidity in the credit markets and low interest rates, debt financing is an attractive opportunity both for expanding the municipal investment program and for meeting short-term temporary current needs. The purpose of this article is to review the debt financing of local authorities in Bulgaria for the period 2008-2018, to assess whether the macroeconomic risk is currently present on municipal debt in Bulgaria, to analyze the potential risks of rising local debt levels. The change in the municipal debt of EU countries is presented, the examples of the implementation of local debt control and monitoring systems are given.

Keywords: *debt financing, local governments, Bulgaria, financial situation*
JEL Codes: *E62, H63, H74*

1. Introduction

In recent years, we have seen an unprecedented situation of low interest rates, both within the European Union and in the United States. Analyzes and forecasts of experts from OECD the World Bank and the IMF show that low interest rates and high liquidity in banking institutions will continue over the next few years. This brings up issues related to the benefits and risks of debt financing of local authorities. In what situations is it useful to use debt and what are the risks involved in attracted funds? This article has discussed the case of Bulgaria. The development of municipal debt financing over the last ten years has been assessed, and the access of small and medium-sized municipalities to attracted finance has been examined. We are looking for an answer to the question of whether municipal debt carries macroeconomic risk currently. Potential risks and threats related to increased use of attracted funds were assessed. Examples of countries with municipalities with liquidity problems are reviewed. Municipal debt control systems introduced by different countries are presented. The dynamics of EU Member States' sub-national debt financing over the last ten years has been assessed. Recommendations for limitation of the risks in connection with municipal debt financing have been formulated.

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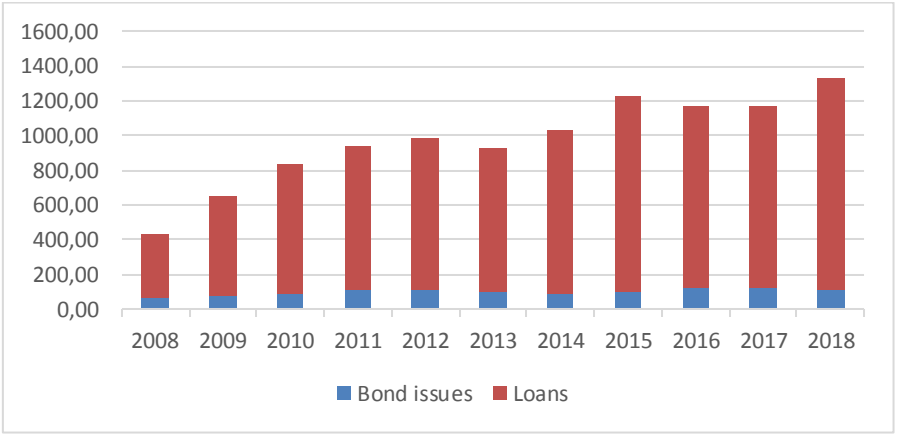
2. Overview of the municipal debt financing in Bulgaria in 2008-2018

Over the last ten years, Bulgarian municipalities have been gradually expanding their access to debt markets. Based on increase of own revenue and development of administrative capacity, large and medium-sized municipalities are increasing their creditworthiness.The process of local debt financing is regulated by the Municipal Debt Act and the Public Finance Act. Figure 1 shows the change of the municipal debt in 2008-2018.

Figure no.1 Debt of Local Government sub-sector 2008-2018 (mill. BGN)



Source: Ministry of Finance, own calculation

For the period, municipal debt increased from BGN 437 million in 2008 to BGN 1334 million at the end of 2018. Loans remain the most actively used instrument by Bulgarian municipalities. Bond issues represent 8-14% from total amount of debt financing of the municipalities for the period. It should be stress that only, the largest municipalities with good level of creditworthiness can use bond issues financing.

Part of the municipalities that use attracted resources under bond issues are Plovdiv, Burgas, Varna, Sliven, Pomorie and Pazardzhik. It should be noted that a significant part of the small municipalities in Bulgaria do not have access to or do not use debt financing. Another part of the small and medium-sized municipalities use debt in moderate size.

For example, the number of **municipalities without debt financing** in recent years is as follows: 2014 - 82 municipalities, 2015 - 81 municipalities, 2016 - 83 municipalities, 2017 - 82 municipalities, 2018 - 84 municipalities (MoF 2020). At the end of 2018, distributed municipal debt has the following structure: 84 municipalities with no credit obligations, 58 municipalities with debt up to BGN 500,000, 38 municipalities with debt between BGN 500,000 and BGN 2 million. , 75 municipalities between BGN 2 million -

BGN 15 million and 10 municipalities with debt over BGN 14 million. **It can be concluded that at this stage a limited number of municipalities have access to large loans.**

The reasons for this are the high dependence on state transfers - the national average is about 58% of municipal revenues (Kalcheva, 2019), low tax revenues and limited sources of own revenues. It should be noted that unlike many countries in the European Union, Bulgarian municipalities do not receive revenue from shared taxes. According EUROSTAT, municipal debt in Bulgaria is 1.2% of GDP for 2018, with EU averages of 5.5% (Annex 1).

2. Municipal debt - threats and opportunities

As it became clear from the analysis, currently we do not identify significant risks and threats arising from the municipal debt in Bulgaria. However, it is not advisable to allow high indebtedness of local authorities in the country. **The main risks** associated with increasing the debt of the municipalities are: the risk of additional imposition of a tax burden on citizens, the manifestation of permanent budget deficits, debt servicing at the expense of municipal services, interest rate risk.

Extremely low interest rates and record lows of the Euribor Index have characterized the debt markets in recent years. Practice shows that some banks even provide loans with negative interest rates. (EURIBOR Interest Reference Site). However, the economic cycle implies a period during which interest rates will gradually rise and return to pre-2011 levels. **This risk should be considered when drafting the long-term projections on debt service, particularly with regard to loans over 5 years.**

In the hypothesis that the municipality is experiencing liquidity problems, there is a risk of an increase in tax rates. It should be borne in mind, that municipal fees are targeted revenue and can only be used to repay debt if those fees originate from the debt financed project. Regarding the transfers, the only general equalizing grants are the source of debt repayment. This defines tax revenue as one of the main sources of debt repayment, it is a major tool for raising own revenues.

Permanent budget deficits can occur when borrowing is inconsistent with the creditworthiness of the municipality and the timing of own source revenues and running costs do not match. *A sharp rise in interest rates not foreseen in the debt repayments projections can also lead to large deficits.* Based on the current conditions on the credit market, it can be assumed that there is also interest rate risk.

Last but not least, inappropriately high debt service costs can lead to a decrease in the volume and quality of goods and services provided by the municipality. At the risk of locking up accounts and activating collateral, borrowers often choose to minimize the cost of services for the citizens. This leads to frustration among the local population. To

minimize the risks arising from debt financing, different debt control systems are in place. These will be discussed in point 4.

The main opportunities that debt financing includes are: first and foremost, expanding the municipality's investment program, achieving a fair distribution of benefits and costs between generations, equitable burden of cost and access to benefits ("inter-temporal equity") reducing operating costs, promoting the economic development of the municipality, applying basic methods for analyzing and evaluating investments, securing and improving access to European and international funds, optimal allocation of resources (Swianiewicz, 2004).

Due to the structure of municipal revenues and low tax autonomy, Bulgarian municipalities find it difficult to raise sufficient funds to make public investments. *European funds have been a major source of local investment in recent years*. When implementing European projects, the municipality should ensure its own participation in the project. Often the amount is beyond the budget of the local authorities. Municipalities often use debt financing to ensure their own contribution in the projects.

Large municipalities and medium-sized municipalities with high local revenues rely on attracted resources to implement important infrastructure projects out of EU funding projects. The debt may allow a substantial expansion of the municipality's investment program. However, this must be accompanied by realistic and long-term forecasts that take into account all risks arising from debt financing.

4. Municipal debt control and monitoring systems

According to Teresa Ter-Minassian and Jon Craig, local debt control systems can be conditionally divided into four groups. The authors placed **Market Discipline** at first place. However, in order for this system to work, several prerequisites must be met, namely: the market must be free and open, municipalities should not be perceived as privileged customers of banking institutions, information on residual debt should be available, a publicly available assessment of the creditworthiness of local authorities, there should be no option for financial support from the central government in the event that a municipality is in financial difficulty. According to an OECD report, this approach is rarely used by countries. An example of a country that applies it is Canada.

At the second place, the authors point out the so-called **Cooperative Approach to Debt Controls**. This approach is identified as being closest to market discipline. The restrictions are not determined by law or by the regulations of the central government, but they are the result of negotiations between sub-national authorities and the central government. The scope of the negotiations includes the formulation of macroeconomic objectives and key fiscal parameters to be followed by subnational governments. Countries agree on specific funding limits based on creditworthiness of individual

municipalities. The approach is applied in some of the Scandinavian countries and Australia.

The next model to limit the debt is **Direct Controls of the Central Government over Subnational Borrowing**. In direct control, central government explicitly approves local government lending. The approval may be in relation to the maximum amount of the debt, the purpose of the loan or it may involve approval of all parameters of the transaction. Control powers generally encompass not only the ex ante authorization of proposed borrowing, but also the ex post monitoring, on a more or less detailed and timely basis, of the subnational governments' financial operations. (Ter-Minassian and Craig).

Next comes **Rule-Based Approaches to the Control of Subnational Borrowing**. In this approach, the limits and rules for assuming municipal debt are contained in the Constitution or laws. The limits may be to set a ceiling on the maximum amount of debt, to introduce a rule on the purposeful spending of a loan or a rule to comply with certain ratios associated with annual debt service costs. Most countries rely on this approach.

In many countries allowed assumption of debt only for investment purposes etc. the golden rule. It is considered that debt incurred to finance running costs can only be covered exceptionally and for a short period of time.

Regarding Golden rule, it is worthwhile to consider the **example of Bulgaria**. The Municipal Debt Act states that a municipality may incur long-term debt to: finance investment projects for the benefit of the local community; refinance existing debt; prevention and elimination of the consequences of force majeure; securing payments on required municipal guarantees.

However, in 2018, the new options were added as follows: funding for municipal projects for concessions for construction or concessions for services with payments from the grantor; financing in case of temporary cash gaps in the budget of the municipality under art. 103, para. 1 of the Public Finance Act; payment of arrears; financing of projects through financial instruments; payment of arrears; securing payments on temporary non-interest loans at the expense of the central budget under the Public Finance Act.

We can identify as more risky the possibilities for financing temporary cash gaps and financing arrears. Temporary cash gaps arise in the divergence of revenue streams and expenses incurred. Often current costs are underfunded. A substantial part of arrears are current cost also. The texts in the law create a prerequisite for violating the Golden Rule, which in turn can lead to financial difficulties for municipalities. At the same time, the practice has shown that a number of European countries impose additional restrictions on long-term municipal financing. Examples are the ban on financing from abroad (Slovakia and Slovenia), financing only certain types of investments (Denmark and Turkey), etc. (OECD, 2016).

It should be noted that in some countries a combined control system is used, subject to government approval for certain types of credit and the legal definition of limits on annual debt payments, for example. Table 1 shows sample restrictions that apply in EU countries.

Table no. 1 – Debt limitation rules in EU countries – sub-national level

Country	Debt limitation
Czech Republic	Subnational debt services should not exceed 30% of their revenue
Greece	Debt repayment should not exceed 20% of regular revenue
Italian local governments	Interest payments should not exceed 12% of current revenue
Slovak Republic	Loan instalments and interest should not exceed 25% of current revenue from the previous year
Poland	Local governments` debt service has not been allowed to exceed the three-year average sum of their operating surpluses and privatisation receipts

Source: Organization for Economic Co-operation and Development

5. Cases of countries with municipalities with liquidity problems

Italy

In 1999, explicit fiscal rules for regions and municipalities were introduced in Italy in the form of the Internal Stability Pact. The pact is subject to annual changes, incl. topics, objectives, sanctions, monitoring procedures and incentives. This creates tremendous uncertainty for municipalities, regions and governments. The targets are usually set for a predetermined reduction in their deficit, with the exception of 2005 and 2006, where there is a system of annual increase ceilings. Then nominal local values are introduced. The aim is to limit debt and improve the fiscal position of local authorities.

Monitoring is also an important part of the Pact: since 2007, local authorities are required to submit to the Ministry of Economy and Finance information on cash and accrued accounts every three months. The financial and economic crisis of 2008-2009 has a major impact on public finances in Italy. The debt-to-GDP ratio reached the 100% threshold before the crisis, and in 2013 it registered values of 133%. At the same time, according to statistics, local government debt to GDP has fallen over the period as a result of fiscal consolidation measures during the crisis. However, the problem lies in *Off budget debts and arrears*. In the Italian legal framework, off budget debts are defined as debts originated by practices not in compliance with accounting rules. Thus, these debts are not recorded and undermine budget truthfulness and transparency; in addition, part of these debts are not formally recognized. According to Corte dei Conti's estimates, this problem concerns about a quarter of Italian municipalities; and in the time period between

2010 and 2012, off budget debts of municipalities have increased to about EURO 1.265 millions (Ambrosanio M. et all, 2014, p. 24).

In connection with liquidity problems, the Italian Government adopted two decrees in 2012 and 2013 and paid a large part of the overdue obligations to subnational governments. Repayment of the commercial debts in 2013-14 represented perhaps the only counter cyclical fiscal measure that Italy could adopt since the beginning of the crisis while still complying with European rules. It is hard to estimate the impact of these payments on growth. The Bank of Italy (2013) estimates fiscal multipliers which depend on how firms use the amount they receive (close to unity in the case of investment in machinery and working capital, and close to zero for the amounts that firms hold for precautionary purposes); in particular the effects of the measures to unblock general government commercial debts (total EURO 47 billion in the two years 2013-14) on GDP is estimated to be a little over half a percentage point in the three years 2013-15. (Ambrosanio M. et all, 2014, p. 26).

The Italian law has provided the prohibition for sub-national governments to borrow money to finance expenses not related to investments but, in fact, long term debt has been used to cover financial imbalances (not caused by investments) in case of off-balance debt until August 2001. Article 119 of Constitution now provides the constitutional relevance of the so-called "golden rule" for regions and LGs, i.e. the possibility to take on loans exclusively for investments. The Constitution has further been recently modified in 2012 in answer to the EU "fiscal compact" rule that provides a strict control over public finances. (Du Boys, 2014). Returning to the debt control systems, it should be noted that debt approval is being introduced in Italy after negotiations between local, regional and central authorities. At the same time, annual debt ceiling limits and debt payment limits are being introduced. The measures aim at improving and maintaining sound financial stability.

Hungary

After joining the European Union by 2004 Hungarian local authorities gradually began to take on more debt. The aim is to provide funding for the co-financing of European projects implemented by subnational governments. Resources in local budgets are insufficient to ensure their participation in municipal projects. Although municipalities take loans for investment projects, most of the investments do not generate revenue. Meanwhile, on the part of the investments are accrued depreciation and maintenance costs increase over time. *During the 2008-2009 crisis, municipalities are required to pay their loan principals, charge depreciation and pay off loans taken to finance projects. This puts a heavy burden on the municipal budgets*.

In addition, municipalities in Hungary are owners of a number of public companies. These enterprises generate significant debt, which is not recorded in the

municipal balance sheet but is stated off-balance sheet. In the event of liquidity problems for businesses, municipalities are committed to providing financial support to their enterprises. At the same time, the interest payments on the loans of the municipalities are increasing, the investment needs are expanding, and lack of working capital to carry out the usual activities of local authorities is starting to be reported.

These factors reinforce its impact on municipal budgets due to the financial crisis. This creates significant financial difficulties for local authorities in Hungary and creates the conditions for consolidation.

The measures taken by the state to stabilize the financial situation of local authorities are as follows:

- At the end of 2011, the debts of municipalities with county rights were settled with the central government having assumed their duties.
- At the end of 2012, a single, non-refundable transfer was granted to communities with less than five thousand inhabitants to settle their debts.
- In 2013, part of the debts incurred by communities with more than five thousand inhabitants was assumed.
- Finally, in 2014, the remainder of the debt of communities with more than five thousand inhabitants was also assumed.
- Two third of local governments took part in the consolidation, which amounted to approx. EUR 4.6 billion. The total debt assumed in the framework of consolidation was equivalent to 4.2 percent of GDP.

In the middle of 2013, Hungary was released from the European Commission's excessive deficit procedure (Bethlendi and Lentner, 2018).

Conclusion

Debt financing provides significant opportunities for expanding the municipality's investment program and for economic growth in the individual regions. At the same time, the use of attracted funds poses significant risks, such as uncontrolled increase in the tax burden, the creation of liquidity problems and the deterioration of fiscal discipline.

The municipal debt in Bulgaria has been increasing in recent years. However, many local authorities do not have access to the debt markets due to limited own revenues. Municipalities with large debt exposures are subject to serious monitoring by the Ministry of Finance. Currently, municipal debt does not carry significant macroeconomic risk.

In order to minimize the risks arising from municipal debt, various debt control systems are in place. However, in times of economic crisis and recession, subnational governments are in financial difficulties. The practice has shown that most often the state financially supports local authorities in order to improve their fiscal position and due to

the lack of bankruptcy or bankruptcy procedures for local authorities. Many countries have examples of this, and the study presents the examples of Italy and Hungary.

REFERENCES

Ambrosanio, Maria Flavia et all. "ECONOMIC CRISIS AND FISCAL FEDERALISM IN ITALY

http://Www.siepweb.it/Siep/Images/Joomd/1409754363Ambrosanio_et_al_WP_SIEP_674.Pdf.

Bethlendi, et al. "Subnational Fiscal Consolidation: The Hungarian Path from Crisis to Fiscal Sustainability in Light of International Experiences." MDPI, Multidisciplinary Digital Publishing Institute, 21 Aug. 2018, www.mdpi.com/2071-1050/10/9/2978.

Céline Du Boys, Emanuele Padovani, Rebecca Orelli. ASSESSING FINANCIAL HEALTH OF LOCAL GOVERNMENTS: GOING BEYOND ACCOUNTING STANDARDS : A COMPARATIVE STUDY BETWEEN FRANCE AND ITALY. EGPA Annual Meeting, EGPA (European Group for Public Administration), Sep 2014, Speyer, Germany. ffhal-01470282f

Congress of Local and Regional Authorities (2018) 35th Session, Report Coping with the debt burden: local authorities in financial difficulty

EURIBOR, (available online) https://www.euribor-rates.eu/ (accessed 17/03/2020)

EUROSTAT, 2020 (available online) https://ec.europa.eu/eurostat/data/database (accessed 17/03/2020)

Kalcheva D., (2019) Comparative analysis of municipal finance in Bulgaria and North Macedonia. Izvestiya, Journal of the University of Economics - Varna. 63 (3). pp. 234 – 251

Ministry of finance (available online) https://www.minfin.bg/bg/613 (accessed 17/03/2020)

Municipal Debt Act

OECD (2016), "Monitoring sub-central government debt: Trends, challenges and practices", in Blöchliger, H. and J. Kim (eds.), Fiscal Federalism 2016: Making Decentralization Work, OECD Publishing, Paris, https://doi.org/10.1787/9789264254053-7-en.

Public Finance Act

Swianiewicz P. (2004), Local Government Borrowing: Risks and Rewards: a Report on Central and Eastern Europe, Local Government and Public Service Reform Initiative, Open Society Institute

Ter-Minassian, T. (2007), Fiscal Rules for Subnational Governments: Can they promote fiscal discipline?, OECD Journal of budgeting, 6

Ter-Minassian, T. and Craig J. (1997), Control of Subnational Borrowing, in Fiscal Federalism in Theory and Practice, Washington DC, International Monetary Fund

Annex 1.

Government consolidated gross debt - local level (% of GDP)

GEO/TIME	2008	2010	2015	2018
European Union	**5.3**	**6.3**	**6.4**	**5.7**
Belgium	5	5.2	5.8	5.1
Bulgaria	**0.6**	**1.1**	**1.4**	**1.2**
Czechia	2.3	2.5	2.4	1.6
Denmark	6.4	6.9	7.2	6.7
Germany	5	6.5	5.9	5
Estonia	3.1	3.7	3.5	2.8
Ireland	2.9	3.3	1.7	1.4
Greece	0.7	0.9	0.9	0.7
Spain	2.9	3.3	3.3	2.1
France	7.5	8.2	9	8.7
Croatia	0.9	1.4	1.6	1.4
Italy	7.8	8.2	8.4	7.2
Cyprus	2.2	2.3	2	0.7
Latvia	3.9	6.6	6	5.6
Lithuania	1.2	1.6	1.9	1.1
Luxembourg	2.3	2.4	2.1	1.6
Hungary	3.8	4.6	0.2	0.5
Malta	0	0.1	0	0
Netherlands	7.2	8.2	8.1	7.3
Austria	2.5	3.6	4.2	4.2
Poland	2.3	3.8	4.4	3.9
Portugal	5	6.1	6	5
Romania	1.8	2.5	2.5	1.8
Slovenia	0.9	1.7	2.1	1.8
Slovakia	1.9	2.7	2.3	2.1
Finland	5.3	6.4	8.9	9.1
Sweden	6.2	6.4	10.3	11.4
United Kingdom	4.3	4.5	4.6	4.7
Norway	9	11.6	14.7	15.5

Source: EUROSTAT

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THE RELIANCE OF EXTERNAL AUDITORS ON THE WORK PERFORMED BY INTERNAL AUDITORS AND ITS IMPACT ON AUDIT ON BANKS: A CASE OF THE FIRST ABU DHABI BANK, UAE

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Abstract

The primary purpose of this research is to study the impact of external audit's reliance on the work performed by an internal audit and its impact on The First Abu Dhabi Bank in UAE, as the case study. Despite the major advances made in the profession of Internal Auditing Function (IAF) and the many benefits of relying on the work performed by these professionals, the collaboration between the profession and external auditing is still a less popular practice in developing countries; as the UAE; many organizations have not picked up. It is important to investigate the reasons that led to this situation. Also, among the few instances where there is reliance on the work of Internal Auditing Function, it is vital to investigate the attribute of the Internal Auditing Function work that guarantees reliance. Lastly, the study aimed to understand the different areas where external audit and internal audit collaborate. By using descriptive and ANOVA analysis, the results derived that external auditors do not actually depend on the internal auditors' inputs; however they rely on the work performed by the in-house auditors. Regarding organizational attributes of internal audit function depends on the audit process and that an audit committee comprised of external member inaugurated. However the audit area reliance on work performed by Internal Audit Function focused mainly on the internal control mechanisms, audit stockholders' equity, and audit of fixed assets.

Keywords: *Audit, Internal Audit, Internal Audit Function, and External Audit*
JEL Codes: *M41, M42*

1. Introduction

In the United Arabs Emirates (UAE), many companies rely on the expertise of external auditors (henceforth referred to as EAors) as required by law. However, very few organizations have IA (henceforth referred to as IA) functioning. The work conducted by IAs can overlap into the work done by EAs, specifically in areas pertaining to the assessment of risk and control processes. It is very common that in executing their roles,

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IAs carry out detailed work of assessing internal controls of a firm and end up performing procedures on financial controls that are relevant to EA's. As such, rather than the EA carrying out the assessment process all over again, he or she may rely on the work carried by IAs (Basu, 2015).

There are various benefits relating to the coloration between internal and external auditors that have led increased uptake of the practice. The advantages of this cooperation include a strengthened working relation between external and IAs, reduction of auditing cots which is appreciated by the client, improved effectiveness and efficiency of the audit process, sharing of knowledge among others (Munro & Stewart, 2013).

In spite of the advantages of depending on the work carried out by IAing function (IAF), the practice is not as common in developing countries such as the UAE. From here came the aim of the study to test the extent of reliance of EAs on the work of IAors in the UAE – one of the few countries in the Gulf region which has embraced (IAF). Besides investigating IAs necessary conditions that warrant reliance on its works. In addition to highlight the audit areas most suitable for reliance between the two professions, and the benefits (impact) of this reliance on a bank by evaluating the case of the First Abu Dhabi Bank (FAB), UAE.

2. Problem Background

Internal Audit (henceforth referred to as IA), as a profession, has been in existence for quite some time. During its progressive years, the profession has grown from mere checking of accuracy in accounting books to being a vital management help in a wide array of areas. Today (IAF) is an integral of part of the management system where it offers expertise to facilitate effective and efficient discharge of managerial duties (Pickett, 2014).

In both government and non-government agencies, the profession of IAing is required to help in roles such as compliance auditing, financial auditing, risk assessment, detection of fraud, operational auditing, and risk management and so on. Today, IAing has the all the hallmarks of being a profession among them Standards of Professional Practice, professional Code of Ethics, and has a well-defined body of knowledge (Pickett, 2014).

Despite the exponential growth of the IA profession, there seems to be inadequate cooperation between IA and their external counterparts, specifically in the area of dependence on the work performed by IAing Function. For this research, the dependence on the IAors does not refer to situations where IAors (henceforth referred to as IA's) offer help to EA's under the direction of the EAs. Rather, the dependence on IA's work refers to situations where the EAs accept work performed by IAF in a complementary way and accept them as their own.

2.1 Auditing in the UAE

The auditing process and practice are not as advanced as in the UAE as it is in developed countries. The use of EAors, mostly Certified Public Accounting (CPA) firm is the norm for many organizations. At the same time, not many laws in the country define the use of IAors, but there are many legal frameworks that define the role of EAor. From a legal perspective, it can be argued that there are no legal requirements necessitating companies to have IA processes. However, based on the efficiency of the collaboration between internal and EAors witnessed in developed countries, some organizations such as FAB have initiated both internal and EA processes (Azad, 2017).

2.2 First Abu Dhabi Bank, UAE's Audit Process

FAB is one of the organizations in the UAE that has an IA process and also relies on the EAors. The IA process is part of the bank's ongoing process of evaluating its internal controls and capital assessment procedures. The main advantage of IA is that it provides an in-house assessment of the adequacy and compliance with the bank's established procedures and policies (Srouji, Halim, Lubis & Hamdallah, 2015). At FAB, the internal process provides senior management and the Board of Directors with important information vital to the discharge of their duties.

At FAB, the responsibility of IAs includes examination and evaluation of internal control systems, examination, and evaluation of risk management and assessment procedures, review of the financial and management systems, evaluation of the accuracy and accountability of financial and accounting records, among others (FAB, 2017).

In conformance with the Statutory of Auditors Appointment Rules (SAAR), which was promulgated with Abu Dhabi Accountability Report, the bank also appoints EAors. For quite some time, the bank has relied on KPMG as its statutory auditor (FAB, 2017). The EAing company provides consultancy services among them an assessment of internal controls, impact assessment and implementation of new taxes, among other roles. Among the important financial statements of the bank that CPA firm evaluates include the statement of financial position, statement of profit and loss, statement of changes in equity, and the statement of cash flow. All these financial statements are recorded and prepared by the accounting team if the bank while evaluation and assessment of their reliability is the mandate of IAors. As such, when using these records, EAors depend on the work performed by IAing Function.

3. Purpose of the Study

The purpose of this study was to investigate the extent of the practice of EA's reliance on the work carried out by IA in the UAE. It is very important to know the auditing practice in UAE. Many pieces of literature assert the fact the predominant

practice with regards to auditing in UAE is EAs. Many firms and companies in the Gulf country rely on services of CPA firms such as Deloitte and KPMG. However, recently, there has been an uptake in the practice of relying on both internal and EA with major organizations such as FAB leading the way. It is vital to research and understand the extent to which EA's rely on the work of IA in the UAE.

The study also aims to identify the qualities or attributes of IA's work that determine EA's reliance decision. It is important to highlight the standards of the work of IA that are to be met to warrant EA's reliance on the work. At the same time, it is vital to highlight the factors that will determine EA's decision to rely on the work carried out by IA.

Another purpose of the study is to highlight the various benefits that arise from such cooperation. What are the mutual benefits that accrue to both EA and IA when the professionals collaborate? It is also important to analyze the impact this collaboration has on the effectiveness and efficiency of the overall audit process. There are also benefits that accrue to the client as a result of this collaboration, and they too should be highlighted. To highlight the benefits that arise from the relationship, the paper will rely on the case study of FAB.

Lastly, from the discussion, the paper aims to suggest areas for future research whose study will lead to an improved and efficient collaboration between EA and IA.

4. Research Questions

This study investigates the extent to which EA's depend on the work of IAors in the UAE by highlighting the case of FAB. In the light of this, this research addresses the following questions, with the first research question being two-folded:

- What is the extent to which EA's rely on the work carried out by IA's in the UAE? And secondly, what determines EA's attitudes towards reliance on the work of IAing Function in accordance with applicable standards such as IAS and SAS?
- What are the necessary attributes IAing Function that warrants EA's reliance decision?
- What are the benefits (impact) of the cooperation on the auditors and client bank?
- What are specific audit areas where EA' surely on the work of IAing Function?

To achieve this objective, the study would be guided by two hypotheses;

- H_1: During the EA of the client (in this study being the FAB), the EAor depends on the professional input of the IAing Function As stated by various accounting standards and laws regarding corporate governance in the UAE, financial records of a public company are required to be validated by an EAor. The case study of the research, the FAB, is mandated by law to rely on EAors.

- H_2: Within the stipulations of applicable standards such as International Auditing Standards and the Generally Accepted Auditing Standard the independent auditor is required to depend on the IAing Function work. When contracted by a client such as a bank like the FAB, an independent auditor is required to rely on the work performed by IAors for efficiency.

- H_3: EA's reliance on the work of IAors usually improves the quality of the overall audit process.

Many studies have evaluated this topic with many coming to the conclusions that there are various benefits of this cooperation. Based on this information, the study will assume that various benefits accrue to the independent auditor, the in-house auditor, and the client (bank).

5. Definition of Terms

Audit- Financial auditing is the process of evaluating and examining a firm's (or an individual's) financial records to determine whether or not they are accurate, reliable, and in accordance with applicable standards such as accepted financial and accounting standards, laws, and any other relevant laws (Shim, 2013).

EAors – auditors who are outsourced to examine an organization's financial and accounting records to give an independent opinion on the financial position of the organization. Most countries have laid down laws and frameworks requiring public companies to have their financial records verified by EAors (Shim, 2013).

Internal Audit and Internal Audit Function - IAors who work for an organization as internal employees (in most cases working in the finance or accounting departments) to examine and evaluate financial records of a company to help improve its internal processes such as risk management, operations, governance, and internal controls (Shim, 2013).

EA's relying on the work of IA's- In accounting this occurs when an independent auditor relies on insight from the work that had been previously conducted by an IAor of the client to give an independent opinion on the financial position of the client (Suwaidan, 2015).

6. Significance of the Study

Many studies have evaluated various aspects of IAing Function including its interaction with EA's. At the same time, the study of EA's reliance on work performed by IA's in developing countries has also been carried with a bulk of them determining the audit areas suitable for reliance and the qualities of IAF that determine reliance on its work.

The reliance on the IAing Function work has many advantages to the all three parties. The benefits that the EAor along with the client enjoy include efficient and effective audit, benefits derived from the expertise of the IA, reduction in the audit cost, fast completion of the audit process, and timely delivery of the final audit report. On the other hand, there are benefits that are enjoyed more by the client than the auditors. These benefits include reduced audit fees, optimal use of human resource, i.e. the IAors, improved efficiency of IAors by working with their external counterparts, and improved efficiency and quality of audit process and the final report.

The importance of this study lies in the important and ever-evolving role that auditing plays in today's organizations through the analysis of FAB. In addition, the paper hopes to argue the reliance on the work of IAing Function as a practice that leads to organizational success. By using the case of NABD, hopefully, the paper can inform other banks to pick up the practice.

7. Literature Review

EAors' reliance on the work of IAing Function is a subject that has been studied extensively with many studies evaluating various aspects of the topic. One of the aspects of this area that has been well researched is the identification of attributes that necessitate the reliance of EA on the work of IAing Function. The common professional standards that are used to manage the conduct of EA's with regards to their decision to use the input in-house auditors in the UAE are the International Auditing Standards (IAS) or Statement on Auditing Standard (SAS). The ISA standard is published by the International Auditing and Assurance Standard Board or the International Federation of Accountants (IFAC) while the SAS standard is published by the Auditing Standard Board of the American Institute of Certified Public Accounts (AICPA) (Al-Sukker, Ross, Abdel-Qader, & Al-Akra, 2018).

According to ISA 315, ISA 610, SAS 128 the final responsibility with regards to auditing of financial reports rests with EA's regardless of their dependence on IAF work. For example, in the event of reliance and there is something wrong with the final audit report, the fault would be directed to the EA (Suwaidan, 2015). That being highlighted, both standards define the framework for reliance and the attributes that IAF work must have to warrant reliance on their work.

Along the mention of standards that define the attributes of IA, Moeller and Witt (2015) identify certain attributes that warrant reliance on the work of IA. The researchers say that in addition to professional and technical qualifications, IAF professionals need to be dedicated to their organization's interest, possess integrity and fairness, alertness, critical attitude, role consistency, and have the ability to make sound judgments (Moeller & Witt, 2015; Srouji, Halim, Lubis & Hamdallah, 2016).

Among other factors that determine reliance, Munro and Stewart (2017) analyzed the difference that outsourcing IAF rather than in-house IAF, has on the EA's reliance decisions. Additionally, the research evaluated exact areas that may necessitate EA's to rely on the input of IAors. With regards to the former, the researchers established that outsourcing IAF as opposed to relying on in-house staff does not have a fundamental influence on the reliance decision. With regards to the later, the research established the exact area where EA's may use the input of IAF for evaluation of internal controls. EAors would rather use this input than carry out substantive tests of accounts (Munro & Stewart, 2017).

Similar research was conducted in 2011 where Desai et al. evaluated the impact IA sourcing on the reliance decision. The research's hypothesis had postulated that EA would assess the competence of in house IAF less favorably than the competence of outsourced IAF. The conclusion of the research supported the hypothesis and showed that a great percentage of EA's preferred relying on the work of IAors hired from outside companies as compared to the work carried out by in-house IA's (Prawitt & Wood, 2016).

In 2013, Glover's study asserted that the literature on EA's reliance on the work of IA is extensive, but the reverse is not the case. The study concluded that argued that the gap had been brought about by a one-sided view of the advantages of the collaboration. Despite the fact that two professionals can mutually benefit from each, most researches' objectives have been to understand the benefits enjoyed by the EA's and the client. The benefits accrued to the IA usually go un-researched. The study identified various areas suitable for cooperation among them sharing findings and opinions about the assessment of risk and internal controls (Glover, 2013).

In another research, Bather and Burnaby (2016) evaluated the recommendation by the Public Company Accounting Oversight Board's which recommendation that EA's should rely on the input of others to reduce additional audit costs that arise from adherence to Sarbanes-Oxley Act (SOX). Additionally, the research evaluated various factors that influence EA's to depend on the work of IA's. Similar to other studies, Cohn concluded that EA's depend on the work carried out by IA's when the perceived risk is low or when the client has insisted. One important fact highlighted in the research is that prior experience of working with IAF greatly influences an EA's reliance decision. The research also established that the work ethic and style of EA's also influenced their reliance decisions, i.e. EA's who avoid conflict with the client will most likely depend on the work of the client's auditors as compared to independent auditors with a more "free" work style (Bather & Burnaby, 2016).

One of the most relevant studies that evaluated this topic in developing countries is the research carried out by Ashraff (2018). The objective of the study was to investigate the extent of EA's reliance on the work performed by IAF and determine the factor that influences Jordanian EA's to collaborate with IA. The research also investigated how the

reliance affects audit fees. The study concluded that the major factors that influenced EA's reliance decision are competence and work performance of the IA. Furthermore, the researcher determined that the most important factor that determined this reliance was the client's size (Ashraff, 2018).

Another study that was carried out in developing countries was by Mihret and Admassu (2013) in Ethiopia. The aim of the study investigated internal and EA cooperation in the context of corporate governance. According to the study, EA's dependence the IAor's input is a concept from the west and has failed to have an impact in developing countries. According to the study, the quality of the work done by IAF is the main factor that influences EA's reliance decision. Additionally, apart from the issue of EA, the researchers proved that improving the quality of the IAF leads to quality corporate governance and encourages cooperation between external and IAors (Hamdallah, 2012; Mihret & Admassu, 2013).

8. Research Methodology

There has been a notable growth in reliance between EA and IA in the UAE. This has led to an increase in the number of independent accounting firms that offer auditing services. Like in many other countries in the developed world, this collaboration has certain attributes and benefits that accrue to the relevant parties such, it is important to investigate the potential impact of this relationship on a client by highlighting the case of the FAB.

8.1 Sample Selection and Data

The collection of data for this research would rely on both primary and secondary techniques. The secondary data would mostly be literature published by other people and institutions. At the same time, to understand the audit process of the FAB (the case study of the research) the search will have to rely on the financial reports of the bank. Unlike in developed countries like the USA, information pertaining to an organization's financial position not easily availed to the public. Researchers have to rely on the reports vailed by organizations to identify the audit areas where EAors depend on.

Meanwhile primary data would be collected through anonymous surveys. It is the objective of the research to evaluate the extent of reliance of EA's and it is only appropriate to source for this information from independent auditors like CPA firms. Despite the known limitations of an anonymous survey, the research will rely on the technique out of necessity. First, relying on anonymous surveys protects the confidentiality of the information. Secondly, the use of anonymous surveys is more practical as compared to field studies which require the disclosure of the subject's details, which is an unacceptable proposition to both the CPA firm and the bank. Lastly, the use of anonymous survey increases the chances of there being a high number of respondents and the levels of honesty.

The survey tools are to be sent to audit managers working for various CPA firms, with a keen focus on KPMG (this is the official audit firm for FAB) because there are no official membership records of CPA's in the UAE, unlike in developed countries, e.g. the membership directory of the AICPA in the USA. As such, the identification of CPA's to take part in the study will entail three steps. First, the study will source for a full list of accounting firms registered in the UAE from the Accountants Business Directory. Secondly, the research will conduct an analysis to filter out firms that do not offer auditing firms to clients. Lastly, the survey instruments would be sent to managers of accounting firms that have been determined to provide auditing services.

The survey technique will also be used to source for information from IAors at FAB to determine the quality of the work of the work of the bank's IAF. Because such information is very sensitive to the bank, and employees would be less cooperative, it is advisable to use an anonymous survey to protect the confidentiality of the respondents.

8.2 Limitations and Delimitations

The greatest weakness of this studies its reliance on anonymous surveys as the main technique of collecting data. There are various disadvantages of this technique, but the relevant one to the study is the credibility of the data. Because there would be no means of validating if the responses in surveys, the credibility of the data collected would be questionable.

There are two delimitations of this research. First, it relies on anonymous surveys as the means of collecting data. Anonymous surveys have drawbacks with the main one highlighted in the previous discussion (Limitations). Secondly, the research only evaluates the case of FAB and not any other bank. As such the inferences of the study might be unsuitable to be applied to the whole banking sector in the UAE.

9. Data Analysis

A one sample T test was used to test the hypothesis of the research and the responses of 58 questionnaires were analyzed by SPSS in Table (1), to scrutinize the first and second hypotheses.

Table (I) One-Sample T Test of Hypotheses

	Test Value = 4					
95% Confidence Interval						
	t	df	Significance	Mean	Difference	
					Lower	Upper
H_1	27.0871	57	.000 *	2.39655	2.5737	2.2194
H_2	191	57	.849	.01724	.1981	.1637

*Significant at $\alpha \leq 0.05$

The result of the one sample t-test for H_1 as (t) = 27.087, p = 0.000, results indicate that the mean of H_1 is lower than the population. At the same time, the P-value is also less than 0.05 significance value, therefor H1 is rejected.

Meanwhile the result of the one sample t-test for H_2 (t) = 0.191, p = 0.849; since the mean of H_2 is close to population and its p value is greater than 0.05, the hypothesis is accepted.

As such,

1. When carrying out independent auditing, EAs do not depend on the input of their internal counterparts, and

2. EAs rely on the work performed by IAF, within the guidelines of the applicable professional standards.

The second objective of the study was to investigate the attributes of IA, which determine EA's reliance decision. In the research, the attributes were determined to be organizational attributes. Organizational attributes are based on standards that govern the profession. As they are unique to each client and in the case of FAB, the attributes are established procedures and policies. A five point Likert type scale was used to gauge the degree of agreement of the sample with the importance of each attribute with regards to their reliance decision.

Analysis of the data in Table (2) shows that practical or organizational independence of the IAor was the most important attribute followed by the presence of an audit committee which has independent members from other areas. These are the most important attributes because by the virtue of employer employee relationship, the IAor cannot be independent from the organization he or she serves. As such, these two attributes ensure that there is some level of independence with regards to the IAors work.

Table (2) Organizational Attributes of IAF

Item No.	Organizational Attributes	Responses	Mean Value	Standard Deviation
1	Is there independence in the internal auditing process	59	4.13	0.67
2	Is an Audit Committee comprised of external members instituted?	59	4.05	0.70
3	What is the quality of the financial and accounting records?	59	3.98	0.60
4	Is there supervision of internal auditors	59	3.96	0.62

The third objectives is of the research was to investigate the areas that are perceived suitable for reliance between the two professions. The research utilized a questionnaire where respondents were to indicate their agreement in each question, as stated in the Table (3). From the descriptive analysis it is clear that the perceived

suitability of the reliance is directly related to the audit risk in a high or minimum rate. However it is obviously noticed from the results auditors' reliance on the work performed by IAF relies the least on the bank statements and sending and receiving conformations of accounts and other payables.

Table (3) Audit Areas for Reliance on the Work Performed by IAF

Item No.	Areas for Possible Reliance	No. of responses	Mean Value	Standard Deviation
1	Analysis of internal control mechanisms	59	4.08	0.67
2	Audit of stockholders' equity)	59	4.03	0.66
3	Audit of fixed assets	59	4.00	0.69
4	Audit of bank statements	59	3.50	0.65
5	Sending and receiving conformations of accounts and other payable	59	3.61	0.69

10. Findings and Implications

To test the hypothesis, the research relied on survey instruments which were sent to both managers of EA firms and personnel of the IAF at FAB. A one sample T test was used to analyze the data collected by using SPSS. The T test revealed that in most cases, EA's do not rely on the work of their internal counterparts, but within the stipulations of relevant auditing standards, the EA's have to rely that input. Regarding the second objective, the research provided responded with a list of attributes of the IA that would influence the reliance decision. The attributes were determined to be organizational attributes and the most important determinant of reliance was practical independence of the IA.

With regards to the third objectives, the research proved that the area most suitable for collaboration is internal controls. For example, one area where EA's could conveniently collaborate with IA's is the audit of fixed assets. Finally, concerning the fourth objective, the research analyzed internal financial and accounting reports of FAB, reports from independent authorities. These reports proved that the bank's overall audit process had been improved as a result of its reliance on both internal and EAors.

The findings of this study have implications that benefit the internal, external auditors, and the client. The implications include optimization of the IAF personnel, the effect of low audit fees, and the proficiency of improved audit efficiency. In addition to

enhancing the quality of the IAF and its effect on the disclosure process and producing timelier audit report.

REFERENCES

Al-Sukker, A., Ross, D., Abdel-Qader, W., & Al-Akra, M. (2018). External auditor reliance on the work of the internal audit function in Jordanian listed companies. *International Journal of Auditing, 34*(5), 107-115.

Ashraff, A. (2018). External auditor reliance on the work of the internal audit function in Jordanian listed companies. *Emerald Insights, 23*(4), 103-127.

Azad, A. (2017). The extent of external auditors' reliance on internal audit function: Case of the UAE. *International Journal of Economics, Commerce, and Management, 5*(4), 451-64.

Basu. (2015). *Fundamentals of Auditing*. Mumbai: Pearson Education India.

Bather, A., & Burnaby, P. (2016). The Public Company Accounting Oversight Board: national and international implications. *Managerial Auditing Journal, 21*(6), 657-669.

Glover, S. M. (2013). *Internal Audit Sourcing Arrangement and the External Auditor's Reliance Decision*. Provo: Brigham Young University.

Hamdallah M (2012). Corporate governance and credibility gap: empirical evidence from Jordan. *International Business Research*, 5(11), 178–186.

Mihret, D., & Admassu, M. (2013). Reliance of external auditors on internal audit work: a corporate governance perspective. *International Business Research, 4*(2), 150-167.

Moeller, R., & Witt, H. (2015). *Modern Internal Auditing 10th Ed.* John Wiley & Sons: New Year.

Munro, L., & Stewart, J. (2013). *External auditors' reliance on internal audit: the impact of sourcing arrangements and consulting activitoes*. Brisbane: Queensland University of Technology .

Munro, L., & Stewart, J. (2017). External Auditors reliance on internal audit: the impact of sourcing arrangements and consulting services. *Griffith Business School Working Paper*, pp. 43-62.

FAB. (2017). *Corporate Governance*. Abu Dhabi: First Abu Dhabi Bank, UAE.

Pickett, S. (2014). *The Internal Auditing Handbook*. Hoboken: John Wiley & Sons.

Prawitt, D., & Wood, D. (2016). Internal audit sourcing arrangement and the external auditor's reliance decision. *Contemporary Accounting Research, 76*(8), 209-221.

Shim, J. K. (2013). *Dictionary of Accounting Terms*. New York: Simon and Schuster.

Srouji, A. F., Halim, M. S. A., Lubis, Z., Hamdallah, M. E. (2015). Determinants of Bank Selection Criteria's in Relation to Jordanian Islamic and Conventional Banks. *International Journal of Economics, Commerce and Management*. Vol. 3(10), 294-306.

Srouji, A., Ab Halim, MS, Zulkarnain, L, Hamdallah ME (2016). International Standards as Corporate Governance Mechanisms and Credibility Gap in Jordan Financial Managers' Point of View. *International Business Management*, 10(6), 751-758.

Suwaidan, M. S. (2015). External auditors' reliance on internal auditors and its impact on audit fees: An empirical investigation. *Managerial Auditing Journal, 25*(6), 509-525.

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CYBERCRIME AND MONEY LAUNDERING IN 21ST CENTURY

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Abstract

This paper focuses on cybercrime and money laundering. Proceeds of these activities may be used to fund further criminal activities and to undermine the integrity of financial systems worldwide. Money laundering is the biggest method followed by the cyber criminals to hide their black money which they get themselves courtesy to financial frauds they involve into.

Money laundering is the process of making large amounts of money generated by a criminal activity, such as drug trafficking or terrorist funding, appear to have come from a legitimate source. The money from the criminal activity is considered dirty, and the process "launders" it to make it look clean.Unlike the "traditional" money laundering methods, which rely on the banking system, cyber-laundering depends on the use of various types of transactions and financial services providers, ranging from wire transfers, cash deposits/withdrawals and e-money transactions to "money mules" and remittance services.

Keywords: *cybercrime, money laundering, cyberlaundaring, financial service providers & wire transfer.*

JEL Codes: *G21*

1. Introduction

In today's word moneys are not generally in hand cash, but rather the electronic media we use to keep or transfer money. Thus laundering in such regard is considered as cyberlaundering. It helps in illegally acquire or transfer money.

According to Ibish &Nedelkovska (2018,p.136), in the unconventional types of crime (the modern types), especially the computer crime and the abuse of transactions, the main problem is the evidence as a main thing for detecting the offender and the crime. Most offenders are educated hackers and, by using special computer programs, the hacker accesses the victim's personal data and, by their abuse, transfers the funds from the victim's transaction to their transaction; in these situations, the only evidence is the

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network and ICT (Information Communicatin Technology). These evidences are located in the cyberspace.

Organizations are now faced with a challenge of integrating cyber incidents into their anti-money laundering (AML) programs. While cybersecurity is an extremely complex issue, the AML portion can be distilled down to a much leaner process. The first step in building a cyber-program is to identify all relevant stakeholders within the organization. At minimum, this should include personnel from the AML, fraud, and information technology (IT) or information security (IS) teams. Outside of these core functions, key lines of business may be of assistance as well.

Cyberlaundering refers to the way in which the mechanism of the internet is used to launder illegal proceeds of crime in order to make such proceeds appear clean. n principle, cyber-laundering is the same as the conventional money laundering practice which consists of three stages:

- Placement, placing dirty money into a legal financial system.

- Layering, transferring or changing the form of money through complex transactions to obscure the origin of funds.

- Integration, returning money that has been 'laundered'. The anonymity and convenience of the internet and other Information and communications technologies (ICT) allow cybercriminals to target victims globally, raising cross-jurisdictional considerations and complicating investigations.

Cyberlaundering is basically committed in 3 steps: Placement of funds, i.e. when illicit money is put into a financial institution, funds are stolen online through digital transactions; Layering, i.e. moving funds inside the financial system and into unregulated financial e-cash systems; Integration, i.e. removing funds all together from the financial system.

As cyber-attacks increase worldwide, financial institutions are working to integrate their compliance department with the Information Management and Information Security ("IM/IT") department. Innovation in cyber security is crucial in levelling the playing field in the fight against cybercrime. Improved visibility is important because it enables organizations to remove unnecessary network and access privileges, track data movements, limit what applications can run on particular computing assets and reduce how much control users have over their systems and their ability to install malicious software inadvertently.

2. Literature

There are a lot of Literatures about cybercrime, money laundering & cyber - laundaringincluding academic studies and empirical studies. The term "money laundering" started to draw attention in the early nineties and it has been defined in different ways. Regardless of definitions, the core meaning of the term is the process of

turning illegally gained money into legal and lawful money with the purposes to disguise original source of criminal or illegal money. Money laundering is the attempt to conceal or disguise the nature, location, source, ownership or control of illegally obtained money. Money laundering is illegal. Boskovic, G. (2003), "Types of money laundering and suppression methods. MA Thesis, Police Academy, Belgrade, p. 31" has concluded that while money laundering methods vary in national and international framework, contemporary tendencies in money laundering include abuse of money deposit cards,use of Internet banking, abuse of electronic cash, abuse of securities, international trade abuse etc. EAG (2013) "Typology Report on Money Laundering Through the Securities Markets" has recommended inter alia that jurisdictions that have not designated securities market offences viz., insider trading, market manipulation and securities-related fraud as ML/TF offences may make the necessary changes in their laws to include the same.

According to Shinder (2011) manylaws have been passed to deal with any type of cybercrime. Although these laws didn't exists many years ago government officials, today they are written and made for cyber criminals. According to Stephen Jeffrey Weaver (2005), cyber-laundering may be defined as the use of internet-based electronic wire transfer methods in order disguise the source of the illicit funds. This type of crime occurs because of the emergence of electronic money66 which has diverged into various systems of global payment networks and the internet. These include electronic payment system, wire transfer system, or internet banking.

3. Methodology

In the research and development of this paper a combination of qualitative and quantitative methodology has been implemented. To achieve the object of this paper, the cybercrime & money laundering data has been collected. The research is based on accessible data from papers, journals, various reports, etc.

4. Analysis and discussion

Cybercrime is criminal activity or a crime that involves the Internet, a computer system or computer technology; identity theft, Phishing and other kinds of cybercrime. In practice, two categories of cybercrime exist:

- The computer as target (using a computer to attacks other computer, e.g. Hacking, virus/worms attacks, Dos attack etc;
- The computer as a weapon (using a computer to commit real world crime e.g. cyber terrorism, credit card fraud and pornography etc.

Types of cybercrime: hacking, cyber terrorism, information theft, phishing, software piracy and virus dissemination. Cyber criminals are using a combination of new cryptocurrencies, gaming currencies and micro-payments to launder up to $200bn in ill-gotten gains. Cyber criminals are responsible for up to 10% of the total illegal profits being

laundered globally, which UN figures indicate equates to about $200bn a year. To achieve this, they are using a combination of crypto-currencies such as Monero, gaming currencies and micropayments, according to a study commissioned by virtualisation-based security.

In the initial - or placement - stage of money laundering, the launderer introduces his illegal profits into the financial system. This might be done by breaking up large amounts of cash into less conspicuous smaller sums that are then deposited directly into a bank account, or by purchasing a series of monetary instruments (cheques, money orders, etc.) that are then collected and deposited into accounts at another location.

After the funds have entered the financial system, the second – or layering – stage takes place. In this phase, the launderer engages in a series of conversions or movements of the funds to distance them from their source. The funds might be channelled through the purchase and sales of investment instruments, or the launderer might simply wire the funds through a series of accounts at various banks across the globe. This use of widely scattered accounts for laundering is especially prevalent in those jurisdictions that do not co-operate in anti-money laundering investigations. In some instances, the launderer might disguise the transfers as payments for goods or services, thus giving them a legitimate appearance.

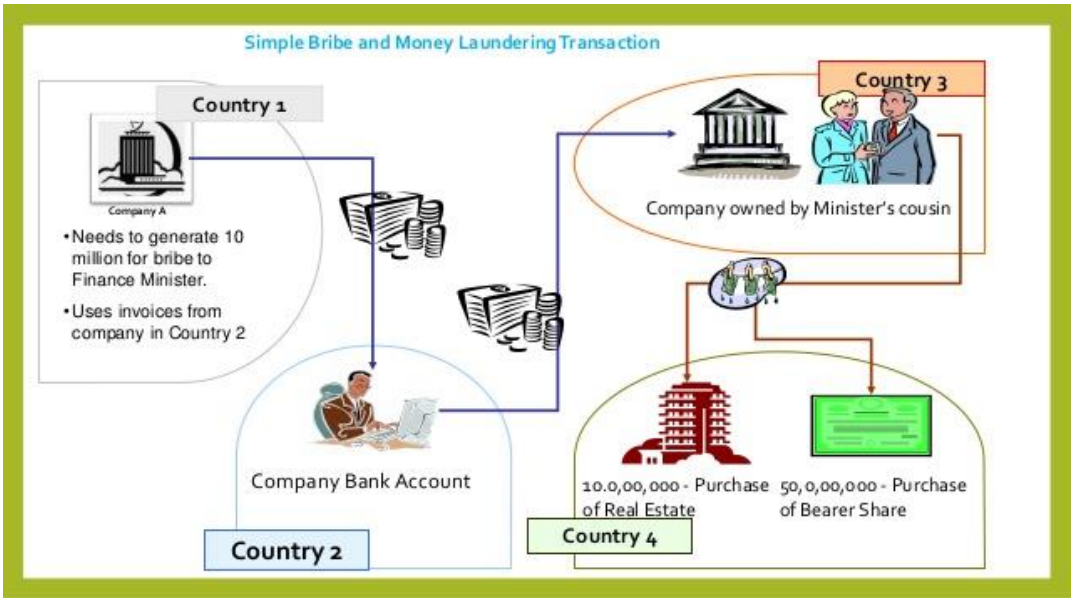
Having successfully processed his criminal profits through the first two phases the launderer then moves them to the third stage – integration – in which the funds re-enter the legitimate economy. The launderer might choose to invest the funds into real estate, luxury assets, or business ventures.

Figure 1 Money Laundering Cycle

Covert data collection indicate that about 10% of cyber criminals are using PayPal to launder money. A further 35% use other digital payment systems, including Skrill, Dwoll,

Zoom and mobile payment systems such as M-Pesa. Methods such as “micro laundering”, where thousands of small electronic payments are made through platforms such as PayPal to avoid triggering alerts, are increasingly common and more difficult to detect. Another common technique is to use online transactions via sites such as eBay to facilitate the laundering.

Figure 2 Money Laundaring Transaction



Around $2 trillion is laundered every year and everyone is paying the price. Banks have huge regulatory overheads. Businesses and consumers encounter friction to open a bank account, transfer funds or instruct a lawyer. The best companies manage risk best.

The deeper "dirty money" gets into the international banking system, the more difficult it is to identify its origin. Because of the clandestine nature of money-laundering, it is difficult to estimate the total amount of money that goes through the laundry cycle.

The estimated amount of money laundered globally in one year is 2 - 5% of global GDP, or $800 billion - $2 trillion in current US dollars. Though the margin between those figures is huge, even the lower estimate underlines the seriousness of the problem governments have pledged to address.

Many countries’ governments are trying hard to implement rules and regulations to counter cyberlaundering. Steps like putting a limit to store value card is proposed by American government’s financial intelligence unit. Points like if all the transactions in a system can be logged at a central point has also been raised. It helps the investigators to reconstruct an electronic audit trail. However, determining the jurisdiction in

cyberlaundering cases is difficult. It has also been discussed to attach unique electronic serial numbers to transactions to prevent criminals for adopting cyberlaundering techniques.

The Money Laundering and Terrorist Financing (Amendment) Regulations 2019 (MLR 2019 came into force on 10 January 2020. These regulations implement the EU Fifth Money Laundering Directive (Directive (EU) 2018/843, '5MLD')) in the UK, and follow a high-level consultation in summer 2019. There was no opportunity to consult on the regulations which were laid before Parliament on 20 December 2019.

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Under the MLR 2019, the scope of persons and firms subject to MLR 2017 has expanded to include:

- Tax advisers – now includes those who provide 'material aid, or assistance or advice, in connection with the tax affairs of other persons, whether provided directly or through a third party'. Instead of 'advice about the tax affairs of other persons'.

- Lettings agents – this includes persons acting on behalf of either landlords or tenants, but only where agreements are concluded for the letting of land (including buildings) for a term of a month or more and a monthly rent (at any point during the term) of €10,000 or more. Certain exclusions apply, for example in respect of businesses which only publish lettings advertisements.

- Art market participants – this comprises (a) persons who by way of business trade in, or act as intermediaries in, the sale or purchase of works of art in respect of trasnactions amounting to €10,000 or more, and (b) the operators of freeports, who store works of art worth €10,000 or more in the freeport.

- Cryptoasset exchange providers – this comprises persons who, by way of business, exchange, or make arrangements to exchange, cryptoassets for money, money for crypto-assets, or one cryptoasset for another, and persons who operate machines which use automated processes to exchange cryptoassets for money (or vice versa). As foreshadowed in the Government consultation, and in line with the FATF Recommendations, this 'gold-plates' the requirements of 5MLD, which focus on fiat-virtual currency exchangers and do not cover virtual-virtual currency exchangers.

- Custodian wallet providers – this comprises persons who, by way of business, provide services on behalf of customers to safeguard, or safeguard and administer, either private cryptographic keys (in order to hold, store and transfer cryptoassets) or cryptoassets.

With cybercrime estimated to cost the global economy $445 billion a year (McAfee 2014), it is now on par with the global drug trade.I n 2015, the Bitlicense was the first bill to be passed in the US that contained considerations of both AML and cyber security Some cryptocurrencies such as Bitcoin have played a major role in the proliferation of online money laundering as it possesses characteristics that criminals are fond of. Bitcoin and other cryptocurrencies are decentralised, anonymous/pseudonymous and irreversible. They provide the means to skirt the Anti-Money laundering safeguards that have been put in place.

5. Conclusion

The future of cyber security and anti money laundering need to be imagined together. With increasingly similar objectives, threat actors and challenges; the industries have much to learn from each other. Both industries face the challenge to continue being effective and yet minimize the amount of information they harvest from regular citizens. Despite being a medium to exchange information in real-time and with scale, the Internet is being misused in several ways.

Among the slew of financial crimes facilitated by the Internet, money laundering draws importance due to its gigantic size and the diverse methods used online to legitimize ill-gotten profits. The criminal practice of money laundering carried out in cyberspace through online transactions has been termed as cyber-laundering. Money launderers are constantly looking for new ways to avoid detection from law enforcement, and the Internet has opened a large window of opportunities for them.

REFERENCE

Nedelkovska, V..Ibish, E., (2018) Banking Management and Economic Crime of Data Abuse, Economics and Management ISSN: 2367-7600; 1312-594X Volume: XV, Issue: 2, Year: 2018, pp. 134-137

https://www.unodc.org/documents/southeastasiaandpacific/2009/02/TOCAMLO/07-CHAPTER_II.pdf

https://www.ifa.org.uk/technical-resources/aml/whistleblowing/money-laundering-regulations-2019

https://eurasiangroup.org/files/Typologii%20EAG/Tipologiya_kiber_EAG_2014_English.pdf

https://medium.com/@jony_levin/is-anti-money-laundering-and-cyber-security-that-different-these-days-49db609a0aab

https://www.cybersecurityintelligence.com/blog/cyber-criminals-have-ingenious-money-laundering-methods-3280.html

https://www.unodc.org/unodc/en/money-laundering/globalization.html

http://documents.worldbank.org/curated/en/962591468313816602/Money-laundering-in-cyberspace

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POLITICAL AND SOCIAL-ECONOMIC ASPECTS OF CHANGES IN AGE AND GENDER STRUCTURE OF POPULATION OF GEORGIA

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Abstract

The changes in age and gender structure of population of Georgia negatively reflected the demographic development, which has worsening tendency and constitutes one of actual problems of the country. The main aim of the study is to find out factors influencing population`s age and gender structure, assessment of changes performed and definition of its further development tendencies. As a result of the study, there was found out, that changes in age and gender structures mainly were caused by political and social-economic factors, which had quite different course through time and space. There are defined a quantitative and qualitative properties, also intra-regional originalities of these changes and there are set the ways to improve demographic condition.

Keywords: *gender, age, demographics, population, migration, welfare*
JEL Codes: *J11, J16, J61, O15, R11*

1. Introduction

We have worsening tendency of demographic condition in independent Georgia. The population in our country was decreased by 31.8% (from 5.4 million to 3.7 million) during of 1991-2019 years. The decrease of population mainly was caused by political processes and worsened social-economic environment, which significantly changed population`s age and gender structure. Accordingly, the changes in age and gender structure has essential influence on demographic development of the country, it has decreased the natural increase rate down to its minimum, thus decreasing the specific share of youth. Coming out of this, complex study of age and gender structure is one of the actual topic of country`s demographic development.

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The main aim of the study is to find out the changes in age and gender structure performed as a result of political processes and social-economic condition and its regional originalities. In order to achieve the aim set, the following tasks are needed to be solved:

- Define the role and place of factors influencing the population dynamics in population`s demographic development;
- Define the changes performed in population`s age and gender structure (due to political processes) and its results;
- Find out the changes made in population`s age and gender structure (as a result of social-economic factors) through time and space;
- Assess the quantitative and qualitative properties of age and gender structure of country`s population towards the neighboring countries;
- Set the ways to improve age and gender structure of the country and improvement of its demographic condition.

The study object is the permanent population existing on the area under jurisdiction of Georgia (we don`t imply the population existing on uncontrolled units of Georgia like Autonomous Republic of Abkhazia and Samachablo region).

2. Methodological basis of the article

2.1. Overview of the literature

The historical and modern development of demographic processes of Georgia is studied in details (Dhaohvili, 1996; Botev, 2012; Meladze, 2013; Davies and James, 2016; Putkaradze et al., 2019; Tsuladze et al., 2008), but there is no perfect study regarding the complex assessment of main properties of demographic processes – changes of its age and gender structure through impact of political and social-economic factors. Coming out of topic`s urgency, its detailed research needs quantitative and qualitative analysis (Putkaradze et al., 2018; Farré, 2013; Patel, 2013; Rossi, 2018), which itself needs comparison of demographic processes of the region and the world (Gavrilov et al., 2010; Ward, et al., 2010; Carstensen, 2015; Kulu and González-Ferrer, 2014; England, 2017; Merchant, 2012; Kunisch, et al., 2011) and establishment of references in line of condition`s improvement.

2.2. Study methods

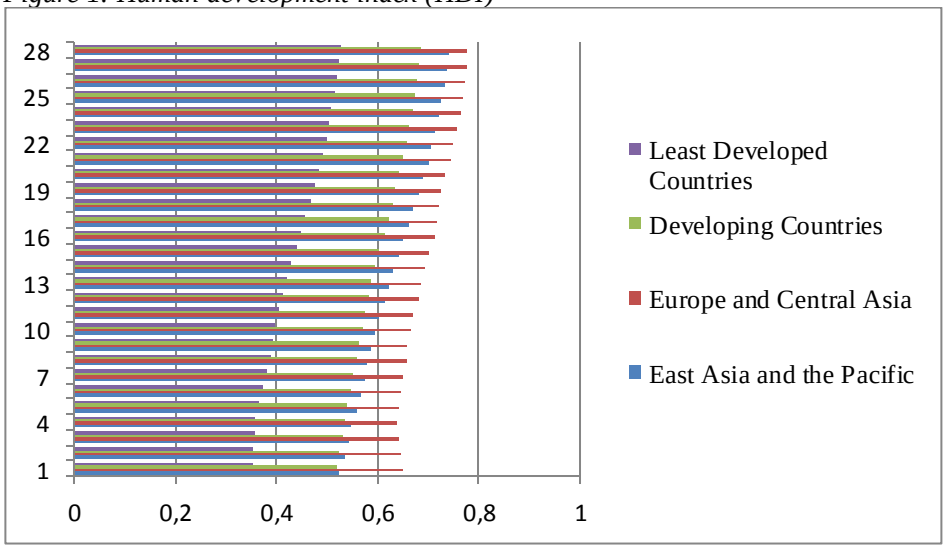
The age and gender structure of population is such a dynamic demographic indicator, that it is being influenced by all of aspects of social development. Thus, complex study of the topic needed different methodical approaches, by means of which there will be found out the qualitative and quantitative properties of changes made in age and gender structure of population in Georgia. During the research the statistical, historical, comparative analysis, spatial-time analysis and other methods were used. Besides, the achievement of aim set was greatly served by studies conducted throughout the world (Cesare, et al., 2018; Hinde, 1998;

Rowland, 2003; Siegel and Swanson, 2004; Uhlenberg, 2009), on the basis of which the conclusions were made.

3. Discussions

Since the end of XX century, some political processes took place in Georgia (the dissolution of Soviet Union, Civil War, "Rose Revolution", 2008 Russo-Georgian War), which led to formation a radically different economic doctrines in the country. National economy was destructed, the unity of the nation was broken and demographic condition worsened. The decrease of population in independent Georgia mainly was caused by political processes and social condition, as a result of which quite big part of population went to emigration, some of them was left in uncontrolled areas (Abkhazia, Samachablo) for residential purposes. The civil war of Georgia brought heavy political, economic, social and other outcomes. Past 20 years of our country distinctly expresses the above mentioned. Indeed, it`s quite hard to live through such deeply transforming epoch even if political and economic reforms could have gone in right directions with desirable paces. Georgia`s move on new economic system with objective necessity needs the study of some theoretical issue of transitional period and social-economic system (functioning in highly developed countries of the world) as well, which will promote the settlement of most complex tasks risen in front of the country. Most of the studies, leaves the issue beyond the vision area, whether how is the influence of social-economic condition (HDI) on demographic condition. According the study outcomes, there is quite big difference among developing and developed countries under Human Development Index (Fig. 1).

Figure 1. Human development index (HDI)

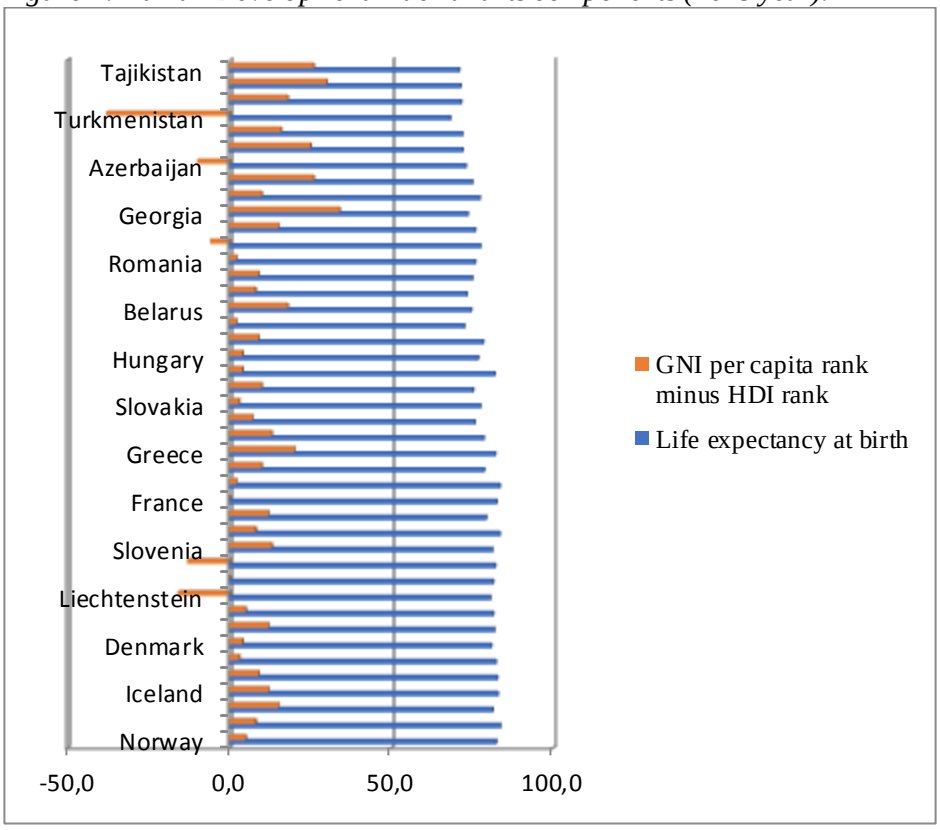


Source: author`s calculation is based on United Nation`s Development Program

The countries included in the given zones are brought in different diapasons according the income per capita (Abuselidze et al, 2019). For instance, GDP per capita under the priority of purchasing power in 2009 in Georgia, income amounted in 5440 USD, in 2010 – 5730 USD, 2011 – 6140 USD, 2012 – 6760 USD, 2013 – 7040 and in 2016 it amounted in 7400 USD. According HDI indicators, Georgia is 70-th in world rating and our country is significantly overtaken by states like: Belarus, Turkey, Bulgaria, Romania. As for priority of purchasing power of the population, the income in Georgia was 8040 USD while it was 8140 USD in Armenia, 18180 USD in Azerbaijan, 23200 USD in Russian Federation and 18760 USD in Turkey. This means, that population`s income and their purchasing power is quite big in our neighboring countries rather in Georgia (Fig. 2), accordingly the population`s welfare is big in Georgia`s adjacent countries (Abuselidze, 2018).

According the analysis of existing data, the natural increase rate of population falls and demographic condition is being significantly changed, especially in of age and gender structure in line with length of life (life expectancy).

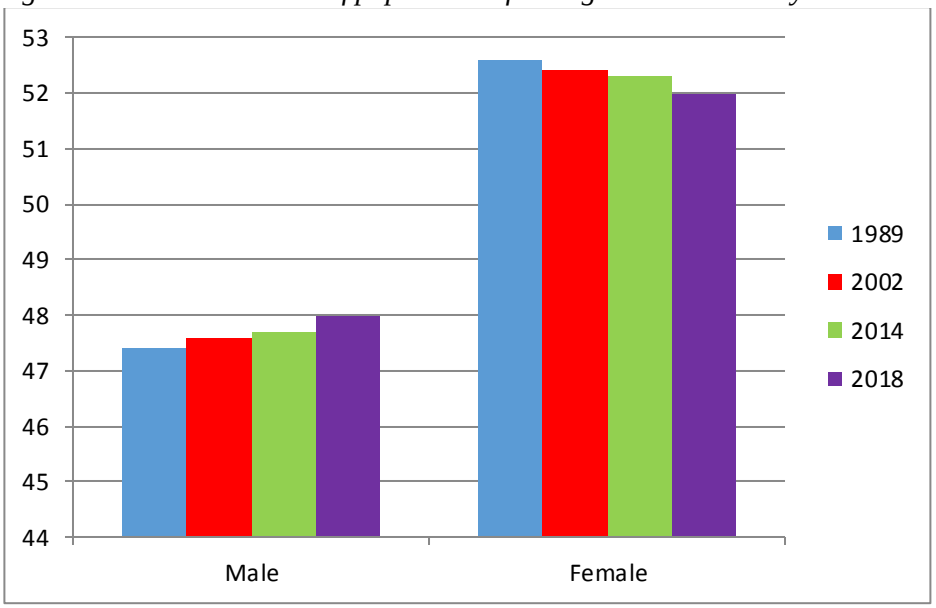
Figure 2. Human Development Index and its components (2018 year).



General regularity is, that crucial impact over population`s age and gender structure is dealt by coefficients of its natural movement. In particular, in case of high natural increase rate, the specific share of men and young ones are quite high, but despite of decreased natural increase indicators (7.8 per mile in 1990 and 1.2 per mile in 2018), the gender structure didn`t worsen, but it is characterized by improved tendency instead, that constitutes an interesting object for the study and definition of purposes is significant task for demographic development.

Age and gender structure of population in Georgia firstly, in 1989-2018 period is developing with worsening tendency, but during of recent period it is characterized with improving tendency (Fig. 3).

Figure 3. Gender structure of population of Georgia in 1989-2018 years.



During of 1989-2018, the specific share of men was increased from 47.4% to 48.0% of by 0.6%. The increase of specific share of men in the country was developing on the background of high emigration and decreased natural increase rate, which doesn`t correspond to general regularity of demographic development. The existing condition is related to political and social-economic factors as well. Negative migration balance of 1992-2018 years period amounted in 911108 man. Generally, as a result of emigration processes, big part of emigrants comes on males, accordingly, specific share of males in Georgia due to high emigration rate could be decreased, bud during of study period (1989-2018 years) it was increased instead (Fig. 3). The mentioned originality was caused by fact, that since the Soviet Union`s dissolution, the whole families moved from Georgia to other former Soviet Countries. Thus, gender structure wasn`t violated. From another

side, the Georgian citizenship was acquired by ethnic Georgians, residing in Turkey and Iran, the most part of which consisted of males also.

Among the social factors affecting the gender structure there should be mentioned the following: on the background of decreased average child-bearing coefficient, the supremacy is given to male gender. The specific weight of males was also slightly increased by circumstance, that women marry on citizens of other country.

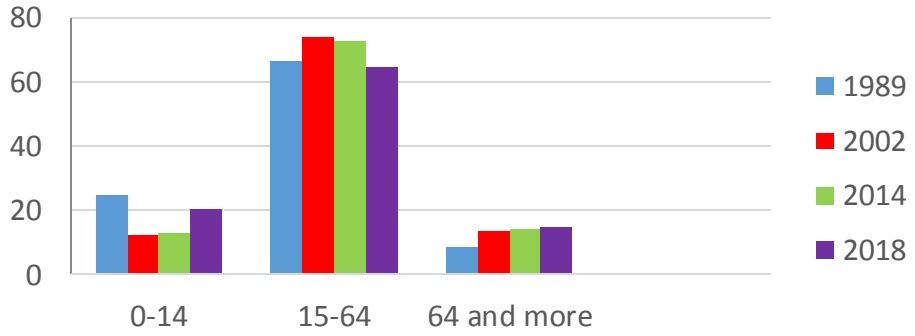
Economic factors influencing the gender structure are as follows: location of Georgia is one of the best in transport and geographical line and presents the foreign capital`s interest field with its business environment. Accordingly, business activity is being performed by males possessing double citizenship and they somehow affect the increased specific share of males.

If we analyze the intra-regional originalities of gender structure throughout the country scale, we can distinctly see the influence of political and social-economic factors as well. In particular, the specific share of males is highest in Kvemo Kartli (Lower Kartli) region – 49.2%, which is caused by high natural increase rate (most part of the population is Azerbaijani, which are known to have high natural increase rate). In another hand, the biggest city of the region – Rustavi presents the largest industry center of the country, where are most of males employed. The impact of industry`s nature on gender structure is also confirmed by fact, that town of Gori during of Soviet period constituted the largest center of light industry (nowadays, the light industry plants actually don`t operate any more), where specific share of women was up to 61% in 1989 while it was dropped down `till 54.1% by 2014.

If we discuss gender structure of neighboring countries, the highest specific part of males is in Turkey (50.2%) and Azerbaijan (49.6%) and the lowest in Russian Federation (46.3%) (The World Factbook, 2020). Comparing to Georgia, in Armenia is almost the same indicator – 48.6%. According an examples of mentioned countries, it is defined, that specific share of males is more in Turkey and Azerbaijan, where the natural increase rate is high as well. Besides, these countries weren`t affected by political and migration processes. The same demographic properties of Georgian and Armenia are connected to identity of above mentioned factors.

Much more important changes of demographic development of Georgia is shaped in dynamics of population`s age structure. The specific share of 0-14 age population in 1989-2018 period differed from 24.8% to 20.8%; 15-64 age group was decreased from 66.7% to 64.5% and 65+ age group was increased from 8.5% to 14.7% (Fig. 4).

Figure 4. Age structure of Georgian Population in 1989-2018 years



The decrease (from 24.8% to 20.8%) of specific share of 0-14 aged population during of 1989-2018 period mainly is caused by decrease of population`s natural increase rate (7.8 per mile in 1989 while 1.2 per mile in 2018). The existing statement is grounded the circumstance, that amount of 0-14 aged population during of 1989-2018 period fell from 24.8% to 12.2%, because of hardest political and social-economic environment and depopulation up to -0.6 per mile. Since 2007, the natural increase rate was improved and it reached its maximum in 2014 – 3.1 per mile. Accordingly, the amount of 0-14 aged population was gradually increasing since 2007. Political and economic factors were slightly affecting the change of qualitative and specific share of 0-14 aged population, because the population of this category was less likely involved in migration processes.

The specific share of 15-64 aged population during of 1989-2018 period was slightly (from 66.7% to 65.2%) decreased. The mentioned age group was especially increased (from 66.7% to 74.3%) in 1989-2002 period, that was related to decrease of population`s natural increase rate and further fall of natural increase rate is caused by increase of 0-14 and 64+ age groups. Besides, emigration of population in workforce age, somehow affected the decrease of population of mentioned age group.

As a result of political and social-economic processes, the specific share of 65+ aged population was increased (from 8.5% to 14.7%) during of 1989-2018 years, which indicates undesirable demographic development. Increase tendency of 65+ aged population was connected to following main factors: 1. Fall of population`s natural increase rate; 2. The population of mentioned group was less likely involved in external migration processes; 3. An average life expectancy level was increased in the country.

Age structure of population in Georgia quite differs by intra-regional line. The specific share of youth is especially low in Ratcha-lechkhumi region, where amount of 0-14 aged population equals to 11.4% (depopulation is observed for a long time) and specific rate of 65+ aged population is highest – 29.1%. According to this point of view, much better situation we have in Kvemo Kartli (Lower Kartli) region, Javakheti region

and Mountainous Adjara as well. The mentioned originality mainly is caused by unequal indicators of population`s natural movement and different migration processes.

Age structure of population of Georgia (0-14 age group - %; 15-64 aged group - %; 65+ aged group - %) seems quite unhealthy comparing to age structure of population of the world. Age structure of population of Georgia is close to demographic properties of highly developed countries, but under the regional scope of view, there is a big difference yet. In particular, almost equal demographic indicators are in Armenia and Russian Federation but Azerbaijan and Turkey has much higher specific share of youth (22.8% in Azerbaijan, 23.4% in Turkey) and low specific share of 65+ aged population (7.3% in Azerbaijan and 8.4% in Turkey) (The World Factbook, 2020). The mentioned originalities mainly are connected to above mentioned factors.

4. Results

On the basis of study of age and gender structure of population of Georgia, there was found out, that significant demographic transformations caused by political and social-economic factors. The following was defined on the basis of performed research:

1. During of 1989-2018 years, the specific share of males was gradually increasing, but during of recent years, we have obviously expressed decrease tendencies;
2. More or less influence on increase of specific share of males was dealt by political processes, especially for 2000-2004 period, the increase of population`s natural increase rate and improved healthcare field;
3. During of 1989-2002 years, the specific share of 0-14 aged population was decreased twice and we have significant improvement since 2014, which is related to fluctuation of population`s natural movement coefficients;
4. The specific share of 15-64 aged population is characterized by decreased tendency, especially during the recent years, which is related to emigrational processes of population in workforce age and increase of average life expectancy level;
5. We have obviously shaped increased tendencies of specific share of 65+ aged population, which is connected with decreased natural increase rate and increased average life expectancy level;
6. The age and gender structure of country`s population is characterized with regional originalities, while in mountainous regions we have decreased share of males and young people. The mentioned originality is more likely related to social-economic factors;
7. Under the regional scope of view and comparing to neighboring countries, the age and gender structure of population of Georgia is close to demographic properties of Russian Federation and Armenia, but has much more violated indicators comparing to Azerbaijan and Turkey.

The results of the study makes clear, that demographic processes in Georgia is developing under worsening tendency. Coming out of the mentioned, improvement of country`s demographic condition should be done by increase of social-economic level. In particular, right demographic policy should improve the population`s natural increase rate and increase of life level should regulate the migration processes and there should be worked out an efficient social-economic projects to hold the population in mountain regions.

5. Conclusion

The changes in age and gender structure of population of Georgia, mainly are connected to political processes and fluctuation of social-economic development level, which is characterized by increased specific share of males, decreased youth and increased retirement age population. In general, demographic development of the country goes under worsening trend. In order to improve the current condition, proper demographic policy and social-economic projects should be implemented.

REFERENCES

Abuselidze, G., Abashidze, J., & Slobodianyk, A. (2019). The Problem of Inequality in Income in Georgia and the Role of Progressive Taxation in Its Elimination. In International Scientific Conference "Whither Our Economies–2019".

Abuselidze, G. (2018). Optimal Fiscal Policy–Factors for the Formation of the Optimal Economic and Social Models. *J. Bus. Econ. Review*, 3 (1), 18-27.

Abuselidze, G., & Slobodyanik, A. (2018). Overview welfare in Georgia and prospects of formation of effective economic and social models. *Сучасні питання економіки і права*, 2 (8).

Botev, N. (2012). Population ageing in Central and Eastern Europe and its demographic and social context. *European Journal of Ageing*, 9 (1), 69-79.

Carstensen, L. L. (2015, February). The new age of much older age. Time Magazine, 185 (6), 68-70.

Cesare, N.; Lee,H., McCormick,T., Spiro, E., & Zagheni. E. (2018). Promises and Pitfalls of Using Digital for Demographic Research. *Journal Demography*. 55 (5): pp 1979-1999.

Davies, A., & James, A. (2016). Geographies of ageing: Social processes and the spatial unevenness of population ageing. Routledge.

Dhaohvili, V. (1996). Georgian population. Tbilisi.

England, P. (2017). Households, employment, and gender: A social, economic, and demographic view. Routledge.

Farré, L. (2013). The role of men in the economic and social development of women: Implications for gender equality. The World Bank.

Gavrilov, L.A., & Gavrilova, N.S. (2010). Demographic Consequences of Defeating Aging. *Rejuvenation Research*, 13 (2-3): pp.329-334.

Hinde, A. (1998). Demographic methods. London: Arnold.

Meladze, G.(2013). Georgia and global demographic processes. Tbilisi.

Kulu, H., & González-Ferrer, A. (2014). Family dynamics among immigrants and their descendants in Europe: Current research and opportunities. *European Journal of Population*, 30, pp.411-435.

Kunisch, S., Boehm,S.,& Boppel. M. (eds) (2011). From Grey to Silver: Managing the Demographic Change Successfully, Springer-Verlag, Berlin Heidelberg.

Merchant, K. (2012). How Men And Women Differ: Gender Differences in Communication Styles, Influence Tactics, and Leadership Styles (CMC Senior Theses No. 513). Retrieved from: https://scholarship.claremont.edu/cmc_theses/513/

Patel, G. (2013). Gender Differences in Leadership Styles and the Impact within Corporate Boards. The Common wealth Secretariat. Retrieved from http://www.cpahq.org/cpahq/cpadocs/Genderdiffe.pdf

Putkaradze, M. & Putkaradze, L. (2018). Effect of political processes on demographic development of Georgia. *Journal of Geography and Earth Sciences*. 6 (2), pp.50-57.

Putkaradze, M. & Putkaradze, L. (2019). The intra-regional originalities of population's dynamics of mountain regions of Georgia. *European Journal of Geography*. 10 (2), pp.107-117.

Rossi, A. (2018). Gender and the life course. Routledge.

Rowland, D.T. (2003). Demographic methods and concepts. New York: Oxford University Press.

Siegel, J. S. & Swanson. D.A. (2004). The methods and materials of demography (2nd ed.). San Diego: Elsevier.

The World Factbook (2020). Azerbaijan.

The World Factbook (2020). Armenie.

The World Factbook (2020). Russia.

The World Factbook (2020). Turkey.

The World Population Prospects: The 2019 Revision.

Tsuladze, M., Maghlapheridze, N., Kopaleishvili, N., & Mamardashvili, G., (2008). Demographic development of Georgia: Yesterday, today, tomorrow. Tbilisi, 2008.

Uhlenberg, P. (Editor), (2009). International Handbook of the Demography of Aging, New York: Springer-Verlag: pp. 113–131.

United Nation`s Development Program (2019). Human Development Reports. Retrieved from: http://hdr.undp.org/en/content/2019-human-development-index-ranking

Ward, J., Bernice, L., Baptist, S., & Jackson, H. (2010). Gender Equality and Economic Growth. London: Chatham House. Retrieved from https://www.chathamhouse.org/sites/default/files/public/Research/Energy,%20Environment%20and%20Development/0910gender.pdfInternet technical or research reports:

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PRINCIPLES OF THE CIRCULAR ECONOMY

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Abstract

Sustainability has become a vital part of many business strategies in the companies, which has prompted growing interest in the circular economy. While the terms circular economy and sustainability are increasingly gaining traction with academia, industry, and policymakers, the similarities and differences between both concepts remain ambiguous.

The holistic view is fundamental to understanding the circular economy, which is not simply focused on using less. The circular economy aims to keep products, components and materials at their highest utility and value at all times. It is restorative and regenerative, and ultimately does reduce resource consumption. But it is also a classic economy in the sense that all activities are aimed at generating an economic benefit.

The circular economy aims to keep products, components and materials at their highest utility and value at all times. It is restorative and regenerative, and ultimately does reduce resource consumption. But it is also a classic economy in the sense that all activities are aimed at generating an economic benefit.

Keywords: *circular economy, principles, sustainability, circular economy model, green economy.*
JEL Codes: *A13, Q59*

1. Introduction

The modern development of society is unthinkable without the cultural and creative industries. (Raya Madgerova, Vyara Kyurova, 2019, pp.104). Thus, the circular economy, through a creative approach, creates incentives for market participants to contribute to a more sustainable approach to natural resources. In essence, the circular economy seeks to replace today's linear, „take-make dispose" approach to resources -

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where many materials are made into products, the products are used, and then the materials are thrown out. Ideally, in a circular economy, the materials are cycled constantly back through the value chain for reuse, resulting in less energy and resource consumption.

The concept of the circular economy comes from the idea that waste, once adequately treated, can become a resource again become a resource, thereby forming a loop in the production-consumption chain. Nevertheless, it is also a widereaching concept with a number of accepted meanings that should at present be analysed. The point is to ensure that economic activity consumes less natural capital than it can regenerate, by mobilizing all levers, from the most traditional (such as recycling) to the most innovative (and notably the digital technology and its many possibilities: sharing platforms, virtualization, 3D printing, etc.).

It is important to highlight certain essential characteristics of the circular economy and to specify what it is not. Firstly, the circular economy is not a shrinking economy. Its aim is to provide goods and services, sometimes new ones, to end-users, while minimising the impact on non-renewable resources and natural regulatory functions. Its objective is not to slow economic growth nor to diminish the benefits for end-users.

The circular economy is not synonymous with the concept of the frugal economy, which shares many essential characteristics with the circular economy even if they differ in some aspects. Both of them rely on the existence of profitable business models that allow industrial actors to invest and develop new types of value chain.

They both aim to be sources of innovation and growth. However, the circular economy also refers to heavy industry with huge capital expenditures, which is quite far from frugal models. Compared to a linear economy, which is primarily transactional, the circular economy encourages greater collaboration between economic actors. Even though some levers promote an economy based on short-loop and local recycling and reuse, as well as local manufacturing initiatives, certain economies of scale or global value chains can lead to more wideraching models.

There are many benefits associated with activating the various levers of the circular economy, both for the environment and for economic growth. It is a process of innovation and transformation of business models, which, despite having a very positive overall impact, could see both winners and losers, notably among companies whose value chain will be affected.

2. Principles of the circular economy

The fundamental constructs and constituent elements of circular business mods can be derived from the main principles of the circular economy. In the literature, such components are understood and Sustainability 2016, 8, 43 6 of 28 defined variously, for instance: the ReSOLVE framework (regenerate, share, optimize, loop, virtualize,

exchange) (Ellen MacArthur Foundation and McKinsey Center for Business and Environment, 2015), ways of circular value creation (Van Renswoude, K., et al., 2015), normative requirements for business models (Boons, F., Lüdeke-Freund, F., 2013), and areas for integration (Laubscher, M., Marinelli, T., 2014).

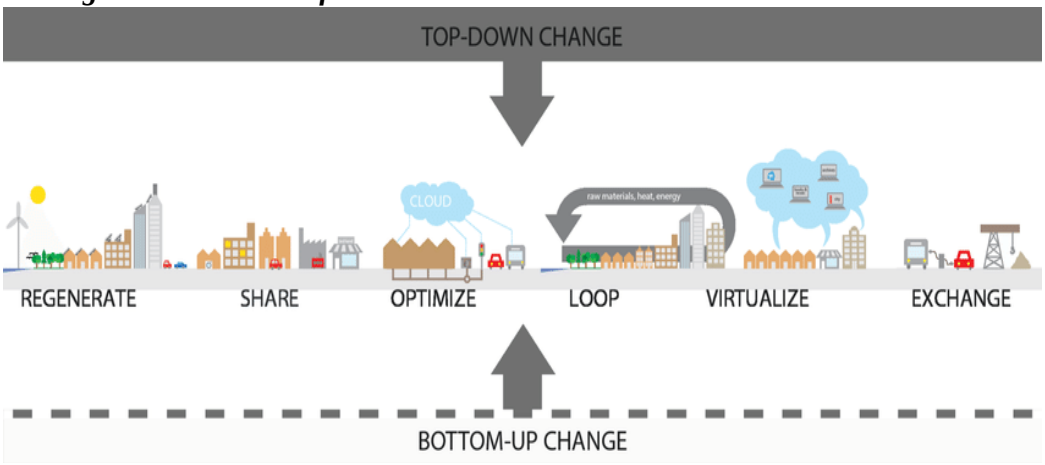
The Ellen MacArthur Foundation of the above-mentioned definition is formed by **three principles:**

1) **Natural capital preservation and enhancement,**
2) **Resource yields optimization, and**
3) **System effectiveness management.**

There are six business actions to implement the principles of the circular economy and which represent major circular business opportunities depicted by the **ReSOLVE framework** (Ellen MacArthur Foundation, 2015):

- **Re**Generate - Regenerate signifies the shift to renewable energy and materials. It is related to returning recovered biological resources to the biosphere. Thus it aims to reclaim, retain, and regenerate the health of ecosystems.
- **S**hare - Share actions aim at maximizing utilization of products by sharing them among users. It may be realized through peer-to-peer sharing of private products or public sharing of a pool of products. Sharing means also reusing products as long as they are technically acceptable to use (e.g., second-hand), and prolonging their life through maintenance, repair, and design-enhancing durability.
- **O**ptimize - Optimize actions are focused on increasing the performance/efficiency of a product and removing waste in the production process and in the supply chain. They may also be related to leveraging big data, automation, remote sensing, and steering. What is important is that optimization does not require changing the product or the technology.
- **L**oop - Loop actions aim at keeping components and materials in closed loops. The higher priority is given to inner loops.
- **V**irtualize - Virtualize actions assume to deliver particular utility virtually instead of materially.
- **E**xchange - Exchange actions are focused on replacing old materials with advanced non-renewable materials and/or with applying new technologies (e.g., 3D printing). It may also be related to choosing new products and services (Ellen MacArthur Foundation, 2015).

Figure 1: ReSOLVE framework



Current economy follows the linear „take-make-use-dispose" model. Raw materials are extracted and transported for manufacturing and turned into products. Products are then transported to consumers, used, and later discarded and eventually replaced by a newer model, causing enormous material and energy waste. The model is based on large amounts of easily accessible resources.

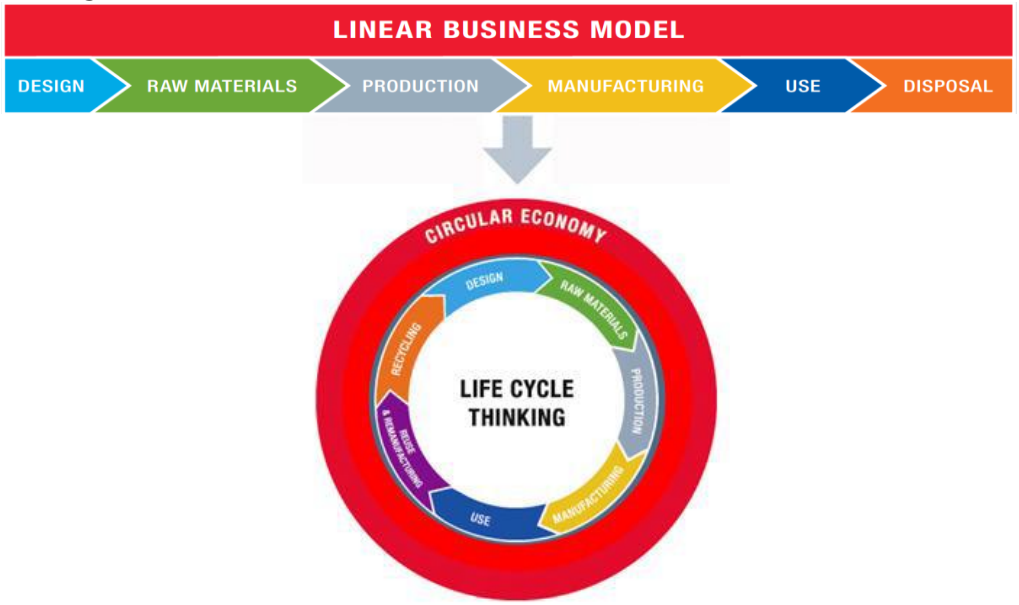
The green economy is based on renewable energy, bio-food, and the use of biodegradable materials.

Bioproducts have become a fashion, a symbol of health and a good intention. However, these products are usually affordable only for a small group of people, as their prices are too high. In actual fact, not all „green" products are green. Most of them need to be transported long distances, so their carbon footprint is rather high. Also, some biodegradable ingredients are not grown sustainably, so their impact on the environment is rather debatable. For instance, the massive palm oil use in several industries during the recent years is not as environmentally friendly as it looks at first. Palm oil is biodegradable, however, the increased palm tree plantations are the detriment of the rain forest. According to Gunter Pauli, also renewable energy coming from solar and wind power plants are heavy tax burdens as they are dependent on subsidies. A new system, smarter and effective, is needed; a system, which would enable to supply healthy food, products and services to the majority of people in an affordable way (Pauli, G., 2010).

The green economy is connected with recycling. According to the Oxford dictionaries, „to recycle" is the process of converting (waste) into a material by reusing it again or by returning material to a prior stage in a cyclic process. Recycling itself decreases the use of raw materials. All in all, it only slows done the natural resources' collapse; it does not prevent it. Recovering raw materials from products by recycling only

is not effective enough due to a high loss of value and energy. However, efficient recycling can be used for the transition period from the linear to the circular system.

Figure 2: Linear vs. Circular business model



Source: *http://www.worldsteel.org/steel-by-topic/life-cycle-assessment/Life-cycle-thinking-in-the-circular-economy.html*

To think circular means to pay attention to the product design at first, so that products are easy to dismantle, rebuild or refurbish and thus easily reused or recycled if needed. Conditionally, the price of these „re-activities" needs to be competitive and, therefore, encouraging to abandon the current practices of buying a new product as the cheapest option.

In addition to the technical side the biological side also needs to be addressed. It concerns not only food and food waste but also the biochemical feedstock that can be extracted from the food waste and to be used as a renewable resource, which can substitute certain chemicals. It includes, for instance, the production of biofuels, renewable bioenergy, value-added biochemicals or plastics produced from renewable sugar sources of bio-feedstocks.

In a circular economy model, a consumer becomes just a user, not necessarily the owner of the goods. The shift from ownership into a service-oriented world is the key. Customers seek for a quality service, which is provided by the use of a product. For

instance, customers are interested in getting illumination; they do not necessarily want to purchase a bulb and a lamp.

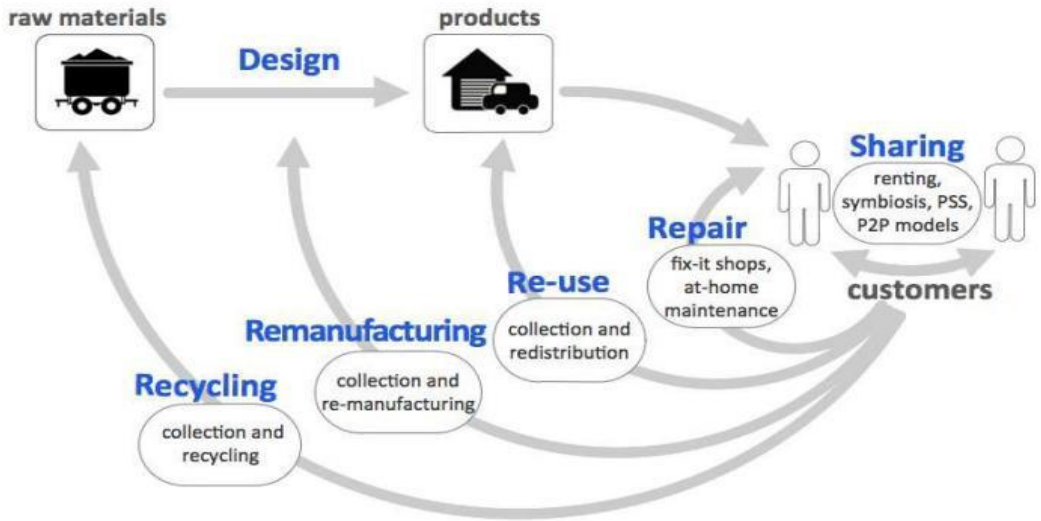
In the circular economy, the resources are allocated in an offered product or service, so its purpose and also the economic benefits are maximized. Then, the manufacturer turns into a service provider and there is an impetus to develop durable, long-lasting and easily repaired bulbs, in order to decrease their costs. At the same time, customers can benefit from high-quality products and services.

The change in manufacturer thinking will boost the innovative and creative product design, producing products that could be repaired, reused, remanufactured or repurposed. It is not anymore about a quantity, it is about a quality, the quality that lasts. The same could be applied to vehicles. Most of the time cars are not in use. We do not need a car, we need to get from place X to place Y, and so we can ask for mileage purchase instead (Kline, R.B., 2016). In general, selling products as services lets the manufacturers preserve resources embodied in the goods and subsequently secure the future own material (resource) supply.

The benefits of the circular economy are to:

- ✓ secure the future resources,
- ✓ to accelerate the regional employment of all qualification scales, and last but not least,
- ✓ to increase the living system resilience and to reduce the greenhouse gas emissions, particularly CO2 by using renewable energy (Growth Within., 2015).

Figure 3: Technical cycle in a circular economy



Source: www.innovationseeds.eu/ImagePub.aspx?id=242392

Some authors (Van Renswoude, K., et al., 2015) identify similar ways of circular value creation, pertaining to the short cycle, where products and services are maintained, repaired and adjusted, to the long cycle which extends the lifetime of existing products and processes, to cascades based on creating new combinations of resources and material components and purchasing upcycled waste streams, to pure circles in which resources and materials are 100% reused, to dematerialized services offered instead of physical products and to production on demand.

Other studies identified four normative requirements for business models for sustainable innovation, grounded in wider concepts such as sustainable development (Boons, F., Lüdeke-Freund, F., 2013, pp.9-19):

1) Value proposition reflecting the balance of economic, ecological and social needs.

2) Supply chain engaging suppliers into sustainable supply chain management (materials cycles).

3) Customer interface, motivating customers to take responsibility for their consumption.

4) Financial model, mainly reflecting an appropriate distribution of economic costs and benefits among actors involved in the business model.

Boons and Lüdeke-Freund (Boons, F., Lüdeke-Freund, F., 2013, p.13.) also noticed that comparable conceptual notions of sustainable business models did not exist. Mentink (Mentink, B., 2014). used a similar approach to the business model as Frankenberger et al. (Frankenberger, K., et.al., 2013, pp.249-273), and outlined the changes of business model components needed for developing a more circular service model, such as:

- Value propositions (what?) - products should become fully reused or recycled, which requires reverse logistics systems, or firms should turn towards product-service system (PSS) and sell performance related to serviced products;
- Activities, processes, resources and capabilities (how?) - products have to be made in specific processes, with recycled materials and specific resources, which may require not only specific capabilities but also creating reverse logistics systems and maintaining relationships with other companies and customers to assure closing of material loops;
- Revenue models (why?) - selling product-based services charged according to their use;
- Customers or customer interfaces (who?) - selling „circular“ products or services may require prior changes of customer habits or, if this is not possible, even changes of customers.

Laubscher and Marinelli (Laubscher, M., Marinelli, T., 2014, pp.17-20) identified **six key areas** for integration of the circular economy principles with the business model:

1) Sales model-a shift from selling volumes of products towards selling services and retrieving products after first life from customers.

2) Product design/material composition-the change concerns the way products are designed and engineered to maximize high quality reuse of product, its components and materials.

3) IT/data management - in order to enable resource optimization a key competence is required, which is the ability to keep track of products, components and material data.

4) Supply loops - turning towards the maximization of the recovery of own assets where profitable and to maximization of the use of recycled materials/used components in order to gain additional value from product, component and material flows.

5) Strategic sourcing for own operations - building trusted partnerships and long-term relationships with suppliers and customers, including co-creation.

6) HR/incentives - a shift needs adequate culture adaptation and development of capabilities, enhanced by training programs and rewards.

One of the most important components of circular business models is the reversed supply-chain logistics. A comprehensive review on this subject has been done by Govindan, Soleimani and Kannan (Govindan, K., et.al., 2014, pp.603-626).

3. Conclusion

Today there is a growing recognition that traditional business models, built on the presumption of unlimited and cheap natural resources, must be reworked for 21st century realities. In the face of the global socio-economic and environmental challenges, governments and companies around the world are looking for alternative approaches to the current „take-make-waste“ economic model in order to drive future growth. This has led to the emerging debate about circular economy, which has been presented over the last years as one of the most promising alternatives. Through closing the materials loops, this economic model decouples growth from consumption of resources which are becoming scarce.

By adopting the CE principles in their businesses, companies can create multiple values and gain a competitive advantage. Closed loop supply chains can generate additional revenues by targeting new markets with an increasing demand (e.g. refurbished and remanufactured products) while reducing production costs through circular supplies (e.g. renewable energy) and resources recovery from discarded products. Beside the economic benefits, there are many intangible benefits arising from the adoption of more circular approach, such as improved green corporate image and enhanced customer differentiation and value through service-based model and closer collaboration. Therefore, companies embracing circular - thinking are building a sustainable competitive advantage.

In order to unleash the real benefits of a circular economy, strategic decisions have to be made by the strategic management, as adopting circularity in business requires a

fundamental rethink of the current industrial processes and implies the implementation of circular business model. In this regard, companies need fearless leadership that embraces and rewards the circular economy, a leadership that encourages not only consumers to alter their consumption from owning to using, but also stakeholders to co-design, co-create and co-own.

REFERENCES

Boons, F., Lüdeke-Freund, F. (2013). *Business models for sustainable innovation: state-of-the-art and steps towards a research agenda*. J. Clean. Prod. pp. 9-19.

Ellen MacArthur Foundation and McKinsey Center for Business and Environment. (2015). *Growth Within: A Circular Economy Vision for a Competitive Europe*. Ellen MacArthur Foundation. Cowes. UK.

Frankenberger, K., et.al. (2013). *The 4I-framework of business model innovation: A structured view on process phases and challenges*, pp.249-273.

Govindan, K.., et.al. (2014). *Reverse logistics and closed-loop supply chain: A comprehensive review to explore the future*. Eur. J. Oper. Res., pp.603-626.

Growth Within. (2015). *A Circular Economy Vision for a Competitive Europe*

Kline, R.B. (2016). *Methodology in the social sciences. Principles and practice of structural equation modeling (4th ed.)*. Guilford Press. US. New York.

Laubscher, M., Marinelli, T. (2014). *Integration of Circular Economy in Business*. In Proceedings of the Conference: Going Green-CARE INNOVATION 2014. Vienna. Austria, pp.17-20.

Madgerova, R., Kyurova, V. (2019). Specifics of entrepreneurship in the field of cultural and creative industries, Entrepreneurship ISSN: 1314-9598; 2367-7597 Volume: VII, Issue: 2, Year: 2019, pp. 103-123 http://ep.swu.bg/images/pdfarticles/2019/EP_2_2019_full_text.pdf

Mentink, B. (2014). *Circular Business Model Innovation: A Process Framework and a Tool for Business Model Innovation in a Circular Economy*. Master's Thesis. Delft University of Technology & Leiden University. Leiden. The Netherlands.

Pauli, G. (2010). *Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs*. Paradigm Pubns.

Van Renswoude, K., et al. (2015). *Part 1: An introduction to IMSA's Circular Business Model Scan*.

https://groenomstilling.erhvervsstyrelsen.dk/sites/default/files/media/imsa_circular_business_modelsapril_2015_-_part_1.pdf.

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E-AGRICULTURE STRATEGY: PARTNERSHIPS AS BUSINESS MODEL FRAMEWORK

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Abstract

The main driver of global demand for agricultural products over the next decade will be growth of population. The need to increase production on same volume of arable land with less water is a priority. In recent decades, agriculture has faced the implementation of various technologies such as IoT and Cloud that enables increased agricultural yield. Keeping in mind that products from different manufacturers are not mutually integrated, farmers are faced with information from different sources that cannot bring additional value. The aim of this paper is to allocate adequate marketing strategies needed for introducing an open agricultural platform as alternative approach for implementing new technologies in agriculture. Therefore, a practical framework mapped to Osterwalder business model was developed. First focus is on win with partner strategy for creating IoT products. Second focus is on creating partner network that will act as indirect sales network for off the shelf products.

Keywords: *Cloud, IoT, Agriculture, Osterwalder business model framework*
JEL Codes: *M10, M11*

1. Introduction

The main instigator of global demand for agricultural products over the next decade will be population growth. Agriculture sector will have to be much more efficient and resilient to ensure global food security. OECD-FAO (2016) states that the world's population is foreseen to expand from 7.4 billion in 2016 to 8.1 billion in 2025. The UN Food and Agriculture Organization states that population growth will lead to increased

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production of food by 70% in 2050 in comparison with 2006 (Meola, 2016). It will be crucial to increase the level of agricultural productivity in order to increase the production on less land with less water

Today, there are many new technologies available to farmers that can help them to increase the yield. Plenty of agricultural industries start to embrace adoption of Cloud and IoT technology in order to enhance efficiency, productivity and global reach while reducing the initial cost and time. With the deployment of IoT, using smart phones, farmers can monitor the agricultural sector by obtaining data from the field. IoT applications for agriculture provide soil, plant and livestock monitoring, greenhouse environmental monitoring, food traceability and etc. Information from the ground IoT devices like weather station, combined with the information received from satellites data feeds, can take into account crop conditions and adjust the way each individual part of a field is farmed—for instance, by spraying when is needed where is needed (Chui, Loffler and Roberts, 2010). IoT is seen as an enabler of precision farming which makes farming more controlled and accurate. Precision farming allows decisions to be made per square meter or even per plant/animal rather than for a field. Pinpointing on promising IoT-based novelties in agriculture is the answer to challenges that agriculture is currently facing.

2. Cloud

Cloud computing along with the IoT has recently become buzzwords in information technology vocabulary. According to Vaquero et al (2009), "Cloud Computing represents a large pool of easily usable and accessible virtualized resources (such as hardware, development platforms and/or services). These resources can be dynamically reconfigured to adjust to a variable load (scale), and to allow optimum resource utilization. This pool of resources is typically exploited by a pay-per-use model in which guarantees are offered by the Infrastructure Provider (by means of customized SLAs)". Buyya (2008) states that "Cloud is a type of parallel and distributed system consisting of a collection of interconnected and virtualized computers that are dynamically provisioned and presented as one or more unified computing resources based on service-level agreements established through negotiation between the service provider and consumers". In a study prepared by Dhar, (2012), Cloud computing is the latest trend to outsource some or complete IT operations to run a business.

The Cloud concept is changing over time. In about a decade, cloud computing has evolved from an initial idea for outsourcing to a widely accepted separate branch of IT industry. The goal of the Cloud is to provide users with on-demand service based on virtualization technology, and the providing form is divided into Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS) (Singh, 2011). De La Hera (2013) determined that the primary driver for using cloud computing is the reduction of infrastructure costs.

3. Concept of IoT

The Internet of Things (IoT) represents a network of various interconnected devices thru internet. The internet is evolving from a network that connects computers into a network of various devices that includes home appliances, toys, cameras, medical instruments and industrial systems. All devices shared information on an internet based or predefined protocols in order to achieve smart real time online monitoring, online software upgrades, manipulation and administration (Vermesan, Friess, 2013 and Vermesan, Friess, 2014).

Major IoT transport technologies include radio frequency identification technology, sensor technology, sensor network technology and internetwork communication (Hong, 2011). The definition of IoT is evolving with the emergences' of Cloud. Nowadays, IoT can be defined as a sum of Cloud, ubiquitous network and sensor network. Cloud platform is central system that provides management of IoT application, computing and processing power. Ubiquitous network includes 3G, LTE, 5G, NB IoT, WiMax, RFID, Zigbee, NFC, Bluetooth and other wireless communication technology. It also includes optical cable and other wire communication protocol and technology (Cai, 2012).

The Internet of Things (IoT) provides many applications for different industries, such as energy monitoring, medicine, building and home automation and agriculture. In agricultural domain, machineries, fresh products and even the farmland equipped with smart chips, thru network connectivity and Cloud, become an integral part of completely new "agricultural infrastructure". Most commonly used IoT applications in agriculture incorporate food traceability, soil, plant and livestock monitoring, monitoring of machineries, etc.

4. E-agriculture strategy and emerging technologies

In recent decades, agriculture has witnessed the deployment of various sophisticated technologies in machinery and deployment of different IoT equipment which represents a step forward in the process of transition to higher quality and efficient agriculture. In a study prepared by Teye et al (2012), adoption of new technologies in Agriculture in Europe is highly related to local challenges. Availability and accessibility of (broadband) Internet in rural areas is an issue in most countries. In East and South parts of Europe, the costs, connectivity and demographical issues (aging of farmers) are often mentioned as key inhibitors for adoption of new technologies in Agriculture. In more economically active agricultural countries (like Denmark and The Netherlands) the standardization of new technologies presence a big issue (Teye et al, 2012).

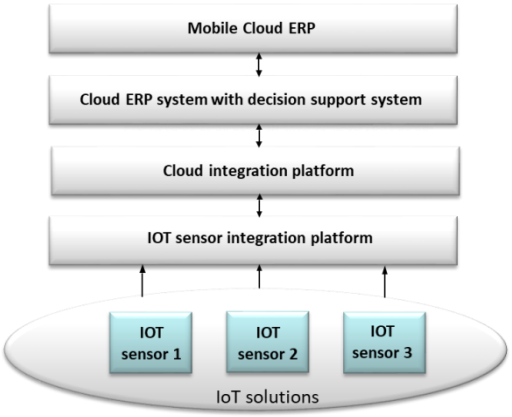
It seems that besides the availability of broadband Internet in rural areas, the biggest drawback of the agricultural IoT market in all countries is the lack of integrated products and solutions. Namely, today farmers are faced with a huge amount of data coming from the fields, but all data comes from a different source through a different

interface. In other words, there are different products/ applications from which users / farmers cannot get added values because they are not integrated. In order to avoid vendor lock in, there is a need for an open agriculture platform based on open standards. The platform will provide interface with recommendations for future actions based on information from different sources (devices) from different vendors. The openness of the agricultural platform should be designed to ensure the smooth integration of any product or service. The farmers will not be limited to choose vendor of equipment. Open standards has to be published under a public domain or licensed to creative communities in order to enable collaboration and support within industries. The central part of the platform should be a farming Cloud ERP system provided as SaaS, equipped with the Decision Support System. The platform should enable integration of multiple sensor systems and to have integrated mobile application that will enable data entry into the central system from where they are generated (as provided in picture 1).

IoT Sensor integration platform is layer responsible for gathering data from IoT sensors and devices.

Cloud integration platform is PaaS based Cloud platform that provides the cloud infrastructure resources based on applications demand, interoperability requirements and automatic execution. Cloud infrastructure includes Storage, Compute power and Networking. Furthermore, this layer should include adapters, which adapt the management requests toward in-house OSS/BSS systems and to specific vendors and providers.

Picutre1. High level example of open agriculture platform



Source: Own work

Cloud ERP system with decision support system is classic farming ERP system enhanced with decision support system. Decision support system is a form of Business Intelligence (BI) system that is using various methods for analysis of gathered data from

various sensors. This system can generate planning and recommend daily scenarios which are based on predefined algorithms.

There might be a several candidates that can be found as providers for such a platform. One of the potential investors might be the Telecom operators. Telecom operators already have Cloud platform and billing in place, have financial power to provide IoT devices as a service and also have an access to large customer base. With adopting of open based IoT platform for Agriculture, Telecom operators may introduce new revenue stream that can improve ROI of the Business Case for development of 5G or broadband internet in rural areas. Other potential vendors of open based IoT platforms for Agriculture can be found in consortium of smaller independent software development companies. No matter who the platform provider will be, there is a need for detailed market analysis and introduction of an appropriate business model framework for market entrance considering that large players dominate the IoT market. Provider of the open agricultural platform (in the further text Provider) has to developed new competences for better position on a new agricultural market.

According to Quèlin (2000), there are three possible way of building internal competences. Description of the paths for developing and acquiring competences is given in the Table 1.

Table no.1-Three strategic ways of building the internal competences.

Paths for developing and acquiring competences	**Implication**	**Limitations**
Internal growth based on existing competences	The new competences must be accessible and disseminated	Limitation of the learning process Intrinsic limitations of the learning process Slow time to market
Mergers and Acquisitions	Development of new bundled products as a resulted of internal and acquired competences	Difficult integration Clash of cultures
Partnerships	Internal knowledge for partnerships	Risk associated with partnerships Capacity for learning

Source: Adopted from Quèlin (2000)

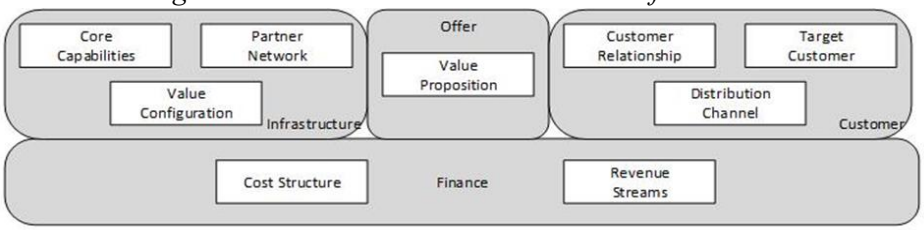
Most of the companies that aspire to get a quick way to gain internal competencies are focused on Mergers and Acquisitions. In this way, a market share is also achieved.

But Agriculture is a niche market. According to Quèlin (2000), partnerships are seen as an alternative to internal growth or merger and acquisitions processes.

5. Business model framework - mapping to Osterwalder business model framework

There are numbers of different models introduced in the literature. They describe the logic behind generation of profit from new business streams. Bouwman, De Vos, and Haaker, (2008) propose STOF (Service, Technology, Organization, Finance) business model framework for analyzing the innovations in delivering mobile services. Faber et al. (2003) propose a likewise framework that includes four characteristics of an acknowledged business model. Leem, Jeon, Choi, and Shin (2005) advocate four phases methodology for development of a business model in computing environments. It is consisting of planning a business model, design, implementation and management. Each phase is consisting of 14 activities and 26 detailed tasks. Most well-known is Osterwalder's (2004) industry generic business model framework that includes nine components organized in 4 major building blocks: 1) Product/Offer (value proposition), 2) Customer Interface (target customer, customer relationship, distribution channel), 3) Infrastructure Management, (value configuration, capability, partner network), and 4) Finance (Revenue and Costs structures) as shown in Figure 1.

Figure 1: Osterwalder's business model framework



Source: Adopted from Nesse et al. (2011)

Offer: This block identifies the customer problems that the company's services or products are solving. The relevant issue to address here is the products and services that needs to be provided and the unique selling proposition. If it is decided to go with partners in creation and promotions of new products, a possible problem is the process for electing and engaging the partners for creating IoT solutions.

Customer: This block identifies segmentation of the customers. Relevant issues that need to be addressed here are the sales channels that are going to be used. Should the Provider use internal sales force or partner channels? How to identify the right partner for resale etc?

Infrastructure: This block identifies the key procedures and needed steps that company should undertake for creating new products or services. Relevant issues to address are the capacity and ability needed to execute the business model. Moreover, what are criteria for finding and electing the right partner for solution?

Finance: This block determine the cost structure of the business, refereeing mainly whether the costs are fixed or variable, operational (OpEx) or investments (CapEx) and ultimately the interrelated risks.

5.1. Offer

Relying on outside partners, many of the challenges during the introduction of new IoT products can be overcome. We assume that Provider will not have free internal resources or internal expertise for the development of innovative solutions in the field of Agricultural IoT services that can solve many of the problems of the farmers in most of the domain. The most appropriate way to address this market is based on utilizing the innovative potential of the wider public by creating a partnership framework with many external independent IoT and software vendors. IoT vendors will be motivated to offer their products through another sales network since they will be willing to expand their sales reach. This means that the IoT solution will be charged through the Provider payment system.

In order to reduce the time to market and to create a win-win partnership, Provider should define a procedure for selecting and engaging partners and to define the business model for cooperation.

IoT partners are the companies with specific IoT solutions that are technically capable to be integrated with the open based IoT platform. We are proposing two models (Advanced, Basic) for engagement of IoT partners with different business models of cooperation. Assessment of the potential partner's/ vendors' should be conducted on two levels (Business and Technical assessment).

Business assessment: Initial screening of particular solution. Business assessment should be divided into strategic assessment of the company and the assessment of the solution.

In the process of Strategic assessment (partner company assessment), the following questions with different weighted factor can be used:

- Is there a long-term strategic synergy between partner and Provider?
- Are company resources limited?
- Is there readiness to go for "Win-Win" on both sides?
- Are partner resources/employees qualified?
- Are partner resources experienced in relevant applications?
- Are partner integration capabilities available?

- Is there a long-term business commitment of the partner?

In regards of the assessment of the solution the following questions different weighted factor can be used:

- What is the solution incremental revenue potential?
- How will Provider stand against the main competitors?
- Is there a bundling potential?
- Does the solution cannibalize some of the existing products?

Technical assessment: Technical assessment should provide GO or NO GO decision for particular solution. IoT solutions offer is preferable to be integrated with standard Provider OSS/BSS landscape. Ease of integration and ability of the application provider to comply with OSS/BSS standards is useful in terms of efficient operations and service management functions.

IoT landscape has many complexities. A brief list of questions for technical assessment mainly related to the application part of the IoT, which may be used as scoring checklist for particular IoT solution, are given below:

- Does application design support multitenant environment and how?
- What is the level of parameterized configuration available for users?
- Does Application support different SLAs per tenant?
- Is there a standard set of OSS and BSS functions associated to application management framework?
- What is the Security design?
- Does Application developer agree to utilize standard provisioning events provided by Provider OSS/BSS systems?
- What is the Application Maturity?
- What are the Reporting options and what is the possibility for integration with DWH/BI systems?
- Is there an application performance monitoring and identification of troubled tenants?
- Is there any technical documentation?

5.2. Customer

Many companies are adopting an incremental rather than transformational approach to delivering and selling new products. They are launching new services while still using their legacy sales, implementation, and customer service approaches. However, the nature of IoT services in Agriculture demands that legacy business approaches to be reevaluated. Standard sales teams may lack consulting capabilities needed to help customers generate the greatest benefits with the introduction of IoT especially in agricultural domain were many variable can be found. Therefore, Provider should create

separate ICT Sales department that will include salesperson with IoT or agricultural background and experience. Core sales team should be incentivized for finding Sales prospect, while ICT Sales should be responsible for closing the sales. In addition, ICT Sales department should be able to engage partners who have knowledge that powers the service offerings, business relationships and trust in business segment.

We are proposing two basic models for engagement of Indirect Sales partners (Gold and Silver partner) with different benefits and different revenue quota on annual level. Screening of the achieved results should be made on monthly level, while Gold Status review should be performed annually. Partner selection process should be based on business assessment. The business assessment would be conducted based on partner company evaluation from strategic and operational perspective. In the process of business assessment, the following questions with different weighted factors might be used:

- Is there a long-term strategic synergy between partner and Provider?
- Are partner resources/employees qualified (e.g. selling skills, technical competence)?
- Is there a long-term business commitment of the partner?
- Is the partner financially stable (e.g. equity/debt, free cash flow)?
- Are customers of partner satisfied (proven track record)?
- Is confidentiality ensured?

Gold status could be achieved by meeting two main criteria – revenue commitment and good score on the business assessment. Upon filing the Gold status request, partner receives a sales quota that needs to be met in order to achieve the benefits of the distinguished level of partnership. After meeting the specified criteria, partner receives a gold status.

5.3. Infrastructure

Proposed "win with partners" business models requires some core capabilities and competencies necessary to execute the business model. Competencies consist of skills, knowledge, practical behaviors and attitudes. Partnership framework should be developed in order to ensure that employee across the company are working to the same standards so that the current high quality service is consistently maintained. Provider must develop and standardize the procedures for selecting IoT and Indirect Sales partners. Thru the process, the initial goal has to be keep in mind and focus exclusively on those partners that are capable to achieve the targets set initially (mainly financial). Strategic goals review should be made annually.

5.4. Finance

Cost structure for the creation of open agriculture platform should be investment (CapEx) type of cost. Cost structure of the partnership should be variable with operational (OpEx) type of cost. Different types of business models should be developed for different type of partnership. For IoT type of partnership, revenues share model should be applicable. For Indirect sales partners, sales commission is advisable.

6. Managing partnerships

Many software companies are finding that their partners influence a significant percentage of their business growth in certain area. There are also risks associated to partnership, which can be summarized as three pitfalls:

- Selecting the wrong partner;
- Inadequate planning and understanding of needs;
- Inadequate internal capacity for managing a partner relationship;

Criteria for Business assessment should be defined as previously explained in order to minimize the possibility for selecting the wrong partner. They should be revised annually using best practice scenarios and pitfalls. The best choice for a partner is not based only on competencies that meet Provider needs and expectations. Also, the partner should share the same values as Provider. Having a clear understanding of needs and expectations from partners is the first step in reducing misunderstandings and conflict between partners. There are several aspects to determining needs, such as follows:

- Identification of the partner's strengths;
- Identification partner's needs and expectations;
- Setting an achievable and clear targets;

In order to avoid the pitfalls related to inadequate internal capacity for managing a partner relationship, it is important to have a clear understanding of the internal roles within the Provider. This ensures that there will be consistency and agreement from leadership in implementing and sustaining the IoT partnership. There may be a difference in the depth of interaction depending on the type of the partner. Generally, we propose an effective framework to be built around two internal teams responsible for sponsorship and operations.

Sponsorship team: These are top-level executives who are responsible for strategic development of the partnership. In addition, to establishing the vision and mission, their role would include such aspects as:

- Understanding the economic proposition – current and future;
- Conceptualizing future strategic possibilities and alignment;
- Securing resources for the partners;
- Setting expectations;

- Setting priorities;
- Managing internal political issues.

Operational team: This group includes people who interact with partners on a regular basis. This team is responsible for implementing the objectives. They are often from cross-functional disciplines, such as IT, ICT Sales, Finance or core Sales team.

7. Conclusion

Agriculture represents a fertile ground for deployment of various IoT applications. The implementation of new technologies in agriculture is accompanied by different challenges which are country specific. A common challenges for all countries is related to the lack of standards and availability of broadband Internet in rural areas. In order to overcome the challenges related to the lack of standards, an open agriculture platform is proposed. The paper highlights both high-level designs of the platform and the Partnerships as business model framework. The proposed methodology of collaborating with IoT companies is based on the Osterwalder framework, in order proposition to be positively applied in a detailed and systematic manner. Generally, we believe that the applied practical framework can help the potential Provider to arrange or rearrange their product development process and sales activities. In the future, the research framework of the paper can be used in order to assign or prioritize different strategies in marketing mixes, such as price, product and placement.

REFERENCES

Bouwman, T., De Vos, H., and Haaker, H. (2008). Mobile Service Innovation and Business Models, Springer Verlag.

Buyya, R., Yeo, C.S. and Venugopal, S (2008). Market-oriented cloud computing: Vision, hype, and reality for delivering it services as computing utilities. CoRR,(abs/0808.3558), 2008.

Cai. K (2012). Internet of Things Technology Applied in Field Information Monitoring, Advances in information Sciences and Service Sciences AISS, Vol.4, No.12, pp.405-414, 2012.

Chui, M., Loffler, M. and Roberts, R., 2010, The Internet of Things. McKinsey Quarterly, March, 2010. Global ICT Standardization Forum for India. www.gisfi.org

De La Hera, M. (2013). Cloud Computing-Service Models. ezinearticles.com

Dhar, S. (2012). From outsourcing to Cloud computing: evolution of IT services. Management Research Review, 664-675

Faber, E., Ballon, P., Bouwman, H., Haaker, T., Rietkerk, O. and Steen, M.(2003). Designing business models for mobile ICT services, In Proceedings of 16th Bled E-Commerce Conference, Bled, Slovenia.

Hong, L. (2011), IoT and cloud computing: Advance Strategic New Industry" [M].Beijing, Posts &Telecom Press, China, 2011.

Leem, C.S., Jeon, N.J., Choi, J.H. and Shin, H.G. 2005. A business model (BM) development methodology in ubiquitous computing environments. In O. Gervasi et al.(Eds.), ICCSA 2005, LNCS 3483, Springer-Verlag, 86-95.

Meola, A. (2016). Why IoT, big data & smart farming are the future of agriculture. Available on-line at https://www.businessinsider.com/internet-of-things-smart-agriculture-2016-10?IR=T. Access on 31.08.2019

Nesse, P.J., Undheim, A., Solsvik, F.H., Dao, M., Salant,E., Lopez, J.M. and Elicegui, J.M.(2011) Exploiting cloud computing – a proposed methodology for generating new business. In Proc. of the 15th International Conference on Intelligence in Next Generation Networks (ICIN'11),Berlin, Germany, pages 241–246. IEEE, October 2011.

OECD‐FAO (2016). OECD‐FAO Agricultural Outlook 2016‐2025 Special focus: Sub-Saharan Africa. Available on-line at http://www.fao.org/3/a-i5778e.pdf. Access on 25.03.2019

Osterwalder, A. and Pigneur, Y. 2010. Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers, Wiley, 288 p.

Osterwalder, A (2004)."The Business Model Ontology; A Proposition on a Design Science Approach"

Singh, B. N. (2011). Cloud Service Models – SaaS, PaaS, IaaS – Which One is For You? Retrieved 2018, from techno-pulse.com.

Teye,F., Holster,H., Pesonen,L., Horakova, S (2012). Current situation on data exchange in agriculture in the EU27and Switzerland. ICT FOR AGRICULTURE, RURAL DEVELOPMENT AND ENVIRONMENT Czech Centre for Science and Society Wirelessinfo, 2012

Vaquero, L.M., Merino L.R., Caceres J., Lindner, M.A (2009). Break in the Clouds. Towards a Cloud Definition. ACM SIGCOMM Computer Communication Review, Volume 39, Number 1, January 2009

Vermesan, O., Friess, P. (2013). Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems, river publishers' series in communications, 2013.

Vermesan, O., Friess, P. (2014). Internet of Things–From Research and Innovation to Market Deployment, river publishers' series in communications, 2014

Quèlin B. (2000). Core competences, R&D Management and Partnerships. European Management Journal Vol 18 No5, 476-487

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LEADERSHIP CAPITAL: CONCEPT AND ROLES

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Abstract

This study seeks to identify the implications of leadership capital in modern companies, and creative leadership roles to meet the challenges of a competitive environment, and the diversity of styles of leaders who come from different environments. The concept of leadership capital is consistent with recent trends in the growing importance of tangible resources, human capital, and leadership intelligence making corporate leadership the most influential driver in making the difference in competitive advantage, market value of the company, and excellence from competitors. This study seeks to identify new roles for leadership as key components of leadership capital. These roles are: Effective influence on individuals to work according to the vision of leadership (the traditional role of leadership), leadership innovation (new principles and methods of leadership work), creating company's higher purpose (corporate citizenship that inspires employees and citizens alike), and finally the ability to excel benchmarking standards with the best competitors in the market.

Keywords: *Leadership, leadership intelligence, capitalization, strategic leadership scale.*
JEL Codes: *M1*

Introduction

In today's business environment, and where intense competition is the most serious challenge to corporate survival and growth, leadership is more important than ever. This competition under globalization has come from all environments in what is similar to the competition of all against all; this makes the sources of risk without limits and unpredictable, compared to any previous period. Although information and communication technology (ICT) has contributed to raising the levels of business intelligence, provided superior and rapid information on the developments of the market and competing companies, but this technology requires the strategic mind that can use

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this information, and the superior capabilities of technology in order to make the most intelligent and capable decision to achieve business results, and outperform competitors. Therefore, companies are in search of the most outstanding leaders at different organizational levels in order to generate superior value from the use of financial, material and human resources. This is why leadership is today the most capable resource for technological advancement, efficient use of resources, effective response to competitive challenge, and better business results for the company. There is no doubt that leadership is not an extraordinary ability, and leaders are not a special breed of people capable of achieving what others, whatever they do, cannot bring. But at the same time, leadership is not a job description as we find in the job description system, nor an administrative center that can meet its requirements. It is important to emphasize that leadership is a unique combination of the leader's special abilities, and the conditions that provide a role for the leader and staff that strengthen the leader by being able to do new things, or achieve what has not been achieved in the past.

Many definitions of leadership have been provided by researchers and authors. The most frequent definition of leadership is the ability to influence employees to work voluntarily to achieve company goals (Hirigappa, 2009, pp.198-199). This key feature of leadership clearly indicates that leadership ensures motivation, guidance for all the company's resources to work consistently, and integrally to achieve the company's goals. However, the most influential factor in employees cannot be a single feature, but a product of a unique harmony of all factors affecting the company and its internal and external environment. That is why some speak of strategic leadership as a strategic force, and a key factor in achieving long-term success in a competitive environment (Hitt et al., 2010; Fulmer and Bleak, 2008; Hughes and Beatty, 2005), Building a sustainable company and contributing to a socially and environmentally responsible environment (Avery, 2005), building trust and commitment to culture and ethical principles in company decisions and practices (Hassan et al., 2013; Sarros et al., 2006; Bellingham, 2003).

With this increased emphasis on the role of leadership in achieving long-term success in the 21st century (Hitt et al., 2010) companies are becoming more interested in investing in leadership and development programs and developing new leaders to avoid any leadership vacuum. The concept of Leadership Capital is being introduced.

Leadership Capital

In today's knowledge economy and intangible assets, leadership is talked about as a component of human capital, which together with organizational capital and client capital represents the three components of intellectual capital (Bounfour, 2005,). This makes us talk in the context of our interest in leadership about the leadership capital, i.e., the treatment of leadership as if it has market value within the so-called leadership

capitalization. To illustrate this comparison, GE's leadership capital is three-dimensional: Storytelling, emphasis on future (Futuring), and unprecedented peak performance. In light of this, the characteristics of bad leadership can be defined as leadership that does not have a motivating story, but many frustrating and rare stories; the past is the recurring picture of the present and it's beyond the usual performance, and the usual performance is everything. The basic justifications for introducing this concept can be summarized in the following:

1. Leadership and market value: The market value of the company is influenced by the leadership that leads the company. Successful leaders when they move to another company increase the value of the company's shares in the market in a way that indicates a greater guarantee of success. This can be demonstrated by the magnitude of the salaries earned by leaders - Leader Gurus in companies, in recognition of their role in the company's success in the market. At the same time, the failure of this leadership (as in Enron) means the end of the company, no matter how great and large, in 1997 the company's market value is 50 billion. The leadership of this company was one of the main reasons after it created the so-called leadership by lies (Thomas, 2006, pp. 6-7).

2. Human Capital: Leadership is a component of human capital. In modern companies, knowledge assets are not technical assets, but also knowledge and expertise. The most important in these experiences, are the experiences of strategic leadership knowledge represented by knowledge strategists, and they are the scarcest category of knowledge individuals. Leaders are doing the right things and making a difference to make the company different.

3. Expected results of leadership capital: Effective leadership is the core of leadership capital. This means that this leadership has outstanding results not only in terms of achievements and superiority over competitors, but also in terms of budget, income and profit statements. The leadership capital, which is already a company asset, promises the expected positive outcomes, which are shown in table, 1.

Table 1: Expected Positive Outcomes from Leadership Capital

Field		Expected Positive Outcomes
1.	Strategic vision	Effective leadership provides a clear vision that helps to focus the company's resources and achieve its superiority over competitiveness.
2.	The ability to influence	The essence of leadership is the ability to influence and motivate employees to work for the company's goals.
3.	Moral role models	Ethical leadership is a guarantee against the consequences of the most negative behaviour that harms the reputation of companies, their relationships with employees, and stakeholders outside the company.
4.	External relations	The success of leadership makes them trusted by financial institutions, government and the local community, all of which work to support the company's policies and plans with

		minimal tensions and external problems.
5.	Business results	Leadership is well aware that the last real success is to stay in the market firstly, and then grow and expand secondly. This requires that this be reflected in the company's accounts and balance sheet at the end of the year.
6.	Developing leadership for the future	Effective leadership is well aware that success can be limited not only to the leader's stay in the company, but also to the ability to achieve continuity of success and find guarantees through the preparation, and development of new leaders, future leaders.

4. Return on leadership: Effective leadership is one of the core resources in the company, and this resource has a return as well as financial and physical capital. In this context, Simons and Davila, (1998, p70) referred to the return on management.

5. Benchmarking in leadership: The competitive business environment has made everything in the company need to competitive benchmarking where leadership performance does not compare with achieving internal goals in the performance of the company, but the most important performance compared to market leaders and the best competitors. The leadership capital is the function of comparative performance with the best competitors who achieve the largest market share, greater market expansion, the highest return on investment and others.

In this context, leadership emerges as the most influential resource in vision, ability and competitive advantage. This makes leadership an important investment in companies that have long-term career paths and training programs to develop leadership in the company.

Leadership capitalization

The use of the term human capital has faced some objections, and Gary Becker, the 1992 Nobel Prize laureate, has indicated his reluctance to call his book 'Human Capital' because some believe that using the term means treating individuals like slaves or Machines. However, as Baker argues, the use of the term in economic analysis helps to understand a wide range of behaviours both in the West and in developing countries and in different cultures (Becker, 1993, pp. 16-7). In this context, the question that can be raised with the wide interest in intellectual capital and its components (human, organizational and client capital) is: Can leaders be capitalized? The answer is that contracts for hiring leaders (whether as executives or individual leaders in their field) reflect as much capitalization as corporate leaders.

Human capital is defined as the accumulated value of investments in such fields as training, education and staff experience. It tries to appreciate the accumulated value of workforce skills in order to transform them from individual ability and merit into collective value in the company. This is what is done with leadership with the

fundamental difference that well-known leaders have a wide reputation that is quickly reflected in the company's value in the market (through the rise in the value of the company's shares in the stock market). Again, how are the salaries of leaders determined by companies? A typical answer can be provided by any specialist Human Resource Management (HRM) book with a chapter on compensation. But what you did not say, and did not explain this stereotypical answer, is that the large and excessive compensation, that leaders receive from their companies, can only be explained by the leadership as a leadership capital, that enhances the company's competitiveness and market value, so the compensation provided to corporate leaders carries compensation for this factor which is not counted in the circumstances of ordinary individuals. This means that standardization of compensation (wages and bonuses) based on several factors is usually: education level, experience or years of service, working conditions, and responsibility (administrative, financial, inventory, etc.) are no longer sufficient with leaders with leadership capital.

All these factors are solid, tangible and identifiable. The question is what about the leadership qualifications and the intangible, the leaders as a message, vision and strategic thinking? What about the special experiences, and leadership relationships of the teamwork working in a spirit of community and cooperation? What about the loyalty that leaders make in workers in the shadow of business wars, especially the war of talent, a war of attracting and stealing outstanding individuals by rival companies?

For all this, we say that leadership capitalization cannot be dealt with through traditional payrolls, but there is a great value is the intangible leaders that they add to the value of the company once moved on and multiply with each leadership achievement in a way that cannot be explained only by considering the new type of capital is capital Leadership.

Tasks for the future

Companies with their leadership and great leadership can create a great company, just as bad leadership can lead to a bad company destined to fail and exit the market. The strong interest in leadership presents companies with new responsibilities and duties that can be defined as follows:

a. Creation of leadership programs: These programs are the program of attracting new leaders, continuous development of current leaders, and effective programs to evaluate leaders at different organizational levels, whether on the basis of historical comparison or benchmarking with the corresponding leaders in the competing companies leading the market.

b. Developing strategic leadership scale: This measure helps companies to assess the leadership ability to develop a sustainable company vision and keep the company effective in the market through important indicators in the forefront: the evolution of the

company's continuous vision, maintain the company's competitiveness in the market, effective organizational performance, increasing market share, comparing business results with the best competitiveness in the areas of: investments in new areas, innovation indicators, stakeholder relations, corporate ethical, social, and environmental reputation.

c. Leadership intelligence quotient: The leadership intelligence represents the ability of the leadership to take the initiative in penetrating new areas and presenting new creative solutions to the current problems, as well as the ability to motivate and inspire employees to develop the participation of workers in the development of these solutions in different areas of work.

d. Developing appropriate financial and accounting methods in order to calculate, measure and evaluate the leadership capital as one of the company's resources and one of its most important assets in developing its business and achieving business results in a competitive business environment. It cannot be accepted that the company's important resources such as human capital, customer, and leadership outside the financial and accounting accounts in the company.

Conclusion

Leadership capital can be considered as the most valuable and influential form of human capital, it represents the creative strategic capabilities of a pattern of leaders who make the difference in the identity of the company and its business results compared to the previous period or with the leading competitors in the market. Companies recognize the importance of leaders and their role in their success and failure. However, the recognition of leadership capital still requires a lot to be transformed into another type of capital along with physical, financial, psychological (Luthans et al.,2007), social (Halpern, 2005), intellectual and its three components. (structural, human and relational). Leading capital can be the new form of corporate capital development. In order to measure and evaluate the leading capital and to calculate the extent of its contribution to increase and improve the market value of the company, it is necessary to face the main obstacles that continue to hinder the introduction of leadership capital in the company's accounts and records outstanding ability in the leading companies in the market.

REFERENCES

Avery, G. C. (2005). Leadership for Sustainable Futures, Cheltenham: Edward Elgar.

Bellingham, R. (2003). *Ethical Leadership: Rebuilding Trust in Corporations*, Amherst: HRD Press Inc.

Bounfour, A, (2005). Modeling Intangibles: Transaction Regimes Versus Community Regimes, In: Bounfour, A, and Edvinsson, L. (Eds). *Intellectual Capital for Communities: Nations,*

Regions, and Cities, pp3-18, Amsterdam: Elsevier Butterworth–Heinemann.

Fulmer, R. M. and Bleak. J. L. (2008). *The leadership advantage*, New York: Amacom.

Halpern, D. (2005): Social Capital, Cambridge: Polity Press

Hassan, S. Mahsud, R. Yukl, G. and Prussia, G. E. (2013),"Ethical and empowering leadership and leader effectiveness", Journal of Managerial Psychology, 28(2), 133 – 146.

Hirigappa, B. (2009). *Organizational Behavior,* New Age International Publishers, New Delhi.

Hitt, M. A. Haynes, K. T. and Serpa, R. (2010). Strategic leadership for the 21st century, *Business Horizons*, 53, pp. 437-444.

Hughes, R. L. and Beatty, K. C. (2005). *Becoming a Strategic Leader*, San Francisco: John Wiley & Sons, Inc.

Luthans, F. Youssef, C. M. and Avolio, B. (2007): Psychological Capital: Developing Human Competitive Edge, Oxford: Oxford University Press.

Sarros, J. C. Cooper, B. K. and Hartican, A. M. (2006). Leadership and character, *Leadership & Organization Development Journal*, 27(8), 682-699.

Simons, R. and Davila, A. (1998): How High Is Your Retune On Management, HBR, Vol(76), No.(1), Jan-Feb, pp70-80.

Thomas, M. (2006): *Gurus on Leadership,* New York: Thorogood.

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COMPARATIVE REVIEW OF PERFORMANCE MEASUREMENT METHODS EFFECTIVENESS

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Abstract

The role of performance measurement methods in the employee performance and organizational productivity has been emphasized time and again in existing literature. However, the comparative relevance of different performance measurement methods for the same purpose remains under-explored in the literature. This paper adopts a systematic review approach to compare and contrast the selected performance measurement methods such as 360-degree feedback, balanced scorecard and EFQM. It was found that every method has its own strengths and loopholes hence there cannot be any "one-size-fits-all" approach when it comes to their impact on productivity and organizational performance. The organizations need to be cautious about which particular method they employ depending upon the objectives of performance measurement.

Keywords: *performance management systems, 360 degree feedback, EFQM, balanced scorecard, organizational performance*
JEL Codes: *O15, D23, M5*

1. Introduction

It is very imperative for an organization to measure the performance of the employees and hence the prominence of performance measurement methods cannot be ignored. However, pointing about the prominence of performance measurement methods, Bhagwat and Sharma (2007) asserted that an effective performance measurement scheme offers the foundation to comprehend the system, impacts behavior all over the system, and delivers evidence concerning the outcomes of system determinations to supply chain affiliates and external shareholders. In effect, performance measurement methods are the adhesive that embraces the multifaceted value-creating system organized, guiding strategic design as well as performing a fundamental part in observing the application of that approach.

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U. S. Department of Health and Human Services (2011) further elucidated that an organization resort to performance measurement methods to differentiate what seems to be happening from what is actually happening, establishing a reference line; i.e., measure beforehand enhancements are made, to make judgements on the basis of concrete proof, to validate that fluctuations lead to progresses, to permit performance evaluations transversely, to monitor procedure fluctuations to guarantee enhancements are unrelenting over time and to identify amended performance. In this regard, Filipova points that performance measurement methods support managers to make effective managerial decisions. (Filipova, 2010).

On the other hand, (Stefanović and Stefanović, 2011) proclaimed that in dearth of an appropriate performance measurement system, the effectiveness of supply chain management is hampered. Though in past, financial accounting principles were employed to track the performance of the organization but these methods failed to assess supply chain performance as they incline to be traditionally oriented and not concentrated on offering a forward-looking viewpoint. Shen, Chen and Wang(2016) cited several reasons behind the intention of the organization to measure the performance. By adopting the performance measurement methods, an organization can ensure that it has assumed a reliable process to ascertain if its existing structure is operating well. Moreover, in the existing economy, there is a need for clarity and accumulative inspection of an administration's commercial practices. These motives encourage an organization's usage of procedure and upshot data as a measure to exhibit its performance.

The aim of this paper is to use secondary research to critically assess and compare different performance measurement methods and how they affect employee performance and organizational productivity.

2. Literature Review

2.1. Role of performance measurement methods in employee performance and productivity

One of the most prominent parts of human resource management is performance management. There are several methods of performance management that are focused on the developmental facets of employees and the performance of the organization (Westover, Westover and Westover, 2010). These methods of performance management are highly effective in enhancing the employee productivity as stated by (Tahsildari and Shahnaei, 2015). This is because after receiving feedback, employees get to know where they lack in performing. Moreover, communicating the loopholes and making discussions with the employees also improves their performance (Adler et al., 2016). However, Patel & Conklin (2012) was of the perception that performance feedback must not include any inaccuracies based on the individual favoritism like stereotyping to have a constructive

consequence on worker productivity and that an operative performance feedback should reveal the contribution of the specific worker enactment.

Steers and Porter (1974) in Islami, Mulolli, & Mustafa (2018) also affirmed the effectiveness of performance measurement methods by pointing out that they have noteworthy impact on performance of the employees (Denisi and Murphy, 2017). This was further substantiated by Latham and Locke (1979) in same study by stating that employees get motivated through these methods and their productivity increased by 19%. On the other hand, Fisher (1995) contradicted the same in Gupta & Parmar (2018) by warning that performance appraisal is more expected to crash if personnel perceive performance assessment as a stick which administration has fetched in, in order to create a foundation for punitive proceedings.

Selvarasu & Sastry (2014) also confirmed that performance measurement techniques result in employee engagement which in turn results in their high productivity. These employees also stay committed and outperform (Karimi, Malik and Hussain, 2011). However the problems sometime arise when the employers detect that some personnel are not outspoken in the assessment, generating apprehensions about the precision of the appraisal (Srikanth and Jomon, 2013). Further, Ahmed & Ramzan (2013) also mentioned that performance measurement techniques also sometimes create stress and conflict among the employees which result in undesirable working environment and impact the productivity. Additionally demoralized employees lack the tendency to work well (Chirasha, Chipunza and Dzimbiri, 2018). Iqbal et al.(2013) alike Biron, Farndaljaap and Paauwe (2011) also authenticated the positive relationship among performance measurement methods and employee performance and productivity. Employee work hard to increase their performance once they realize how well they are accomplishing the task assigned to them (Mazzei, Flynn and Haynie, 2016).

3. Methodology

The paper adopts the systematic review approach. A thorough review of secondary sources retrieved from varied published sources has been conducted. There is a lack of consensus on the performance measurement methods adopted in organizations and their effect on organizational productivity and employee performance. Through the studies reviewed in this review, their applicability is checked in order to establish their validity.

3.1 Search strategy and selection process

The systematic review process involved utilization of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) application. The guidelines of this application were followed while searching through the selected databases for papers relevant to employees' performance measurement systems and their impact on employee performance and organizational productivity.

3.2 Databases searched

The search process of this study started with understanding the aim of the study. Once it was clear that the different performance measurement methods have to be compared, the keywords were identified. On the basis of these keywords, studies were explored on Google Scholar and Google. Other sources referred to included ABI/ INFORM, Ingenta Connect, Taylor and Francis Online, Wiley Online Library, Sage Premier, Emerald Insight, Science Direct, and Scopus.

3.3 Keywords

The keywords included: Human capital index by Watson Wyatt, Human capital monitor by Andrew Mayo, Sears Roebuck model, Balanced Scorecard or BSC, EFQM model of quality, Performance measurement method, Employee performance, organizational productivity, Drawbacks of performance measurement, importance of performance measurement, performance measurement methods and employee performance, performance measurement methods and organizational productivity. Only search results which showed the appearance of one or more of these keywords multiple times in the paper were selected for the review. This yielded a total of 2.153 papers relevant to the present study.

3.4 Inclusion criteria

The inclusion criteria for the papers reviewed in this paper has been listed below:

- Studies which include at least one of the keywords relevant to the study.
- Studies for which complete access is available or where the abstract provides the required information.
- Studies published in or after 2014.
- Studies which were published in the English language.
- Studies pertaining to the impact of performance management systems, particularly on organizational productivity and employee performance.

3.5 Exclusion criteria

The papers that were excluded or not considered in this paper fall into one or more of the following criteria:

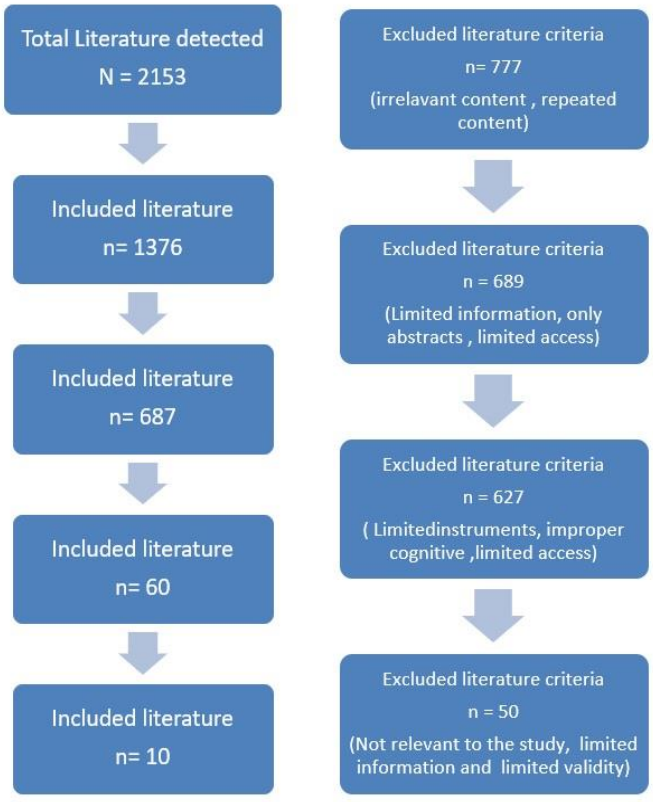
- Studies that contained the keywords but did not contain the information about them in the same context under study.
- The studies that are older than 2014 because they might not be relevant in present context.
- Studies published in languages other than English.

• Studies that recommended the use of a new performance management system which was yet untested.

3.6 Study selection

The search results from the keywords among all databases yielded a total of 2.153 studies which were relevant to this study. Thereafter, Covidence removed 777 studies which were irrelevant or were repetitive in nature. After that, the researcher eliminated studies which had limited access. In the final step, 60 studies were left, which after the full text screening process were further limited to 10 final studies

Figure no. 1:PRISMA framework for study selection



Source: Author

3.7 Data Extraction

Table 1: Data Extraction

Authors	Aim of the Study	Tool used	Methodology	Key Findings
(Zondo, 2018)	The study aimed to evaluate the effectiveness of using the 360-degree performance appraisal system in increasing productivity	360 degree performance appraisal system	An empirical study of 24 respondents was conducted using pre and post-implementation of the system in KwaZulu-Nata, South Africa.	The study found that there was no improvement in labor productivity post implementation of the 360 degree feedback system.
Kucharčíková, Mičiak and Hitka (2018)	The aim of the article is to explain the nature of HCM and to propose an approach to assess the effectiveness of investment in education as a part of the HCM process.	HCM	An empirical study of 350 Slovak enterprises	HCM represents a modern concept of the people management in enterprises. It is a process within which the key processes in an enterprise are being identified, and the key components of the human capital are being determined for these processes. Subsequently, the value and efficiency of the utilization of these HC components and the efficiency of investment in HC are calculated and assessed.
(Das and Panda, 2015)	The study aimed to assess the effectiveness of 360-degree performance appraisal system as a development tool for employee performance in the education sector in India	360-degree performance appraisal method	Empirical study of 100 employees from the education sector was conducted using a close-ended questionnaire containing 5-point likert scale questions	The study found that as compared to traditional feedback systems, the 360-degree performance appraisal system was more effective in identifying employees' strengths and weaknesses.
Bayo-Moriones *et al.* (2011)	The purpose of this paper is to analyse the differences between the two most frequently used quality management approaches	ISO 9000 and EFQM	Empirical study involving 665 Spanish business establishments with at least 20 employees from the manufacturing,	EFQM involves an advance over ISO 9000 regarding the use of innovative work practices.

	implemented by firms, ISO 9000 and EFQM, in terms of their impact on the adoption of innovative work organization practices		building and service sectors	
(Seyedi, Ashtari and Zahiri, 2015)	The study aimed to assess the impact of application of the EFQM performance assessment system on employee performance in the oil and gas industry of Karun, Iran.	EFQM	An empirical study of 92 employees from different oil and gas companies was conducted using a close ended questionnaire containing five-point likert scale questions.	The findings indicate that there is a significant positive relationship between the EFQM performance evaluation system and employee performance, among other factors.
Chia, Goh and Hum (2009)	The purpose of this paper is to empirically examine what senior supply chain executives measure and how they perceive performance measurement from a balanced scorecard (BSC) perspective.	Balanced Scorecard	An empirical study involving 113 logistic professional from Singapore	Despite the need to provide a balanced approach to performance measurement, firms remain focused on traditional financial measures (gross revenue, profit before tax, and cost reduction). From a supply chain perspective, the non-tangible measures such as customer satisfaction are most measured. Other key logistics performance indicators include on-time delivery, and customer satisfaction.
(Roussas and McCaskill, 2015)	The study aimed to examine the likelihood of employees accepting the Balanced Scorecard system of performance management over other methods.	Balanced scorecard	A survey of 60 professionals based in Phoenix area, London, Rome, and Paris was carried out using a 10-point Likert Scale questionnaire consisting of 10 items.	The findings indicate that although most participants reported not using the balanced scorecard, they had a favorable view of the system as compared to other performance management systems in terms of saving

				time and cost and improving quality.
(Hoang *et al.*, 2018)	The study aimed to understand the factors affecting successful implementation of the balanced scorecard in organizations.	Balanced scorecard	The authors conducted a survey of 217 respondents from different firms in Vietnam. The questionnaire contained items based on 5-point Likert Scale.	The results indicated that the balanced scorecard is an effective performance management system which can be applied successfully when business strategy, environmental uncertainty, intensity of competition and total quality management of the companies are aligned with the system well.
(Bonn, Agyeman and Osei, 2017)	The study aimed to assess the use of balanced scorecard for successful performance management systems in Ghanaian banks.	Balanced scorecard	30 employees from 3 Ghanaian banks were surveyed using a close-ended questionnaire based on five-point Likert scale.	The survey revealed that Ghanaian banks rely heavily on the financial perspective of the balanced scorecard system to measure the performance of employees, which led to certain limitations such as reduced customer satisfaction.
(Jenabagha, Gorji and Siami, 2011)	The study aimed to evaluate the impact of staff performance assessment based on EFQM model on the productivity and performance of hospitals in Iran	EFQM	203 employees of different hospitals in Gorgan in Iran were surveyed using a close-ended questionnaire.	The study found that there are improvements necessary in the model in order to enhance its effectiveness and improve the performance of hospitals

4. Discussion

Kucharčíková, Mičiak and Hitka (2018) through an empirical study amongst firms of Slovakia have little knowledge about the implications that good Human capital management can have. Although the firms were adopting measures to improve employee performance, but they had no measures to improve. HCI posits that if a new HR technology is adopted that impacts the efficiency, service and is well in budget, the firm

is bound to escalate the returns to the stakeholders (Kucharčíková, Mičiak and Hitka, 2018).

Keeping pace with the contemporary dynamic world, organizations are acknowledging their unique traits, target markets and requirements. In these conditions companies develop and implement various innovative approaches and tools to enhance their operations, one of which is the Balance Score Card. (Dimitrova, 2014). The Balance Score Card (BSC) is quite a popular HR tool but it requires comprehension, endorsement, and steadfastness from all hierarchical levels of the organization. Also, it requires alteration of culture to make it more accommodative. These changes definitely impact the productivity of the employees implicitly and BSC helps the organization to set clear performance goals for the employees (Chavan, 2009). The Balanced scorecard is a proven instrument that can help any firm to prepare a framework of strategic management and performance measurement. It helps to gauge the overall organization's performance with respect to four dimensions: financial, customer, internal business process, and learning and growth. It enables the firm to develop a mutually acceptable vision and consolidates the employees' behavior, strategies adopted and business processes towards common goals (Kaplan, 2010).

Balanced Score card have found relevance across industry vertices. Chia, Goh and Hum (2009) explored the application of BSC in the domain of supply chain firms and based on a study involving 113 logistic professional from Singapore, and found that most entities emphasized on financial performance indicators with lesser emphasis on service quality measures like on-time delivery and customer satisfaction. Adoption of BSC will help to measure the performance in a more structured and balanced manner and thus create greater value for the organization, customers and other stakeholders. Likewise, based on an empirical study on the banks of Anambra State, Africa, Meduoye and Mbah (2019) advocated the use of Balanced Score Card as it served as a report card and constructively impacted the performance of the case banks with respect to the aforesaid four parameters. Based on the findings, the scholars strongly recommend the adoption of BSC at all levels of the organization: individual, departmental or strategic business unit and corporate. Apart from the conventional business sectors, Beard (2009) recommend the adoption of BSC in higher education institutes and help them manage their performance strategically. It will also help them to analyze the expectations of the stakeholders and what the institutes are actually offering and make conscious efforts to map the disparity.

The European Foundation of Quality Management model is a platform that enables firms to learn from the industry best practices. It is basically a model of reference for excellence. It has a non-prescriptive framework of nine criteria that encompass all activities and every possible stakeholder that can aid in striving for excellence. These nine criterions are leadership, policy and strategy, people, partnership and resources, processes, customer results, people result, society results and key performance results.

Thus, there is a lot of focus on how organizations handle their human resources. EFQM enables firms to better plan, manage and augment the human capital and persistently upscale employee competencies. Further, the model is proactive to enable firms to gauge their performance with respect to its people. Thus, the model can be of vital use to better the performance of the employees and ensure creation of a loyal and committed workforce. However, the major drawback of this model is that it has no external certification to assess the level of execution and data available about the model is very less (Bayo-Moriones et al., 2011).

The EFQM model has been widely used as a valid substitute for TQM in the European premise. It helps firms to evaluate themselves on the basis of five parameters: employees, customers and society, partnership and resources and processes. Based on the empirical study of 141 Spanish Hotels, Benavides-Velasco, Quintana-García and Marchante-Lara, (2014) reveal that adoption of such exhaustive models have positively impacted the performance of the hotels and also deliver the highest possible value to the stakeholders. Since the model encourages a comparison between firms, organizations often get ideas to strategically plan out their business process in order to optimize the cost and persistently improve the service quality. Thus, the model is quite impactful in improving overall organizational performance. Similar findings were reported in the studies of (Jenabagha, Gorji and Siami, 2011) and (Seyedi, Ashtari and Zahiri, 2015).

Lastly, the 360-degree feedback system is being increasingly implemented as a performance appraisal system in organizations today (Baroda, Sharma and Bhatt, 2012). The findings of (Zondo, 2018)'s study the 360-degree feedback system specifically improves self-awareness and reduces the rate of spoilage in an organization. This eventually improves organizational performance. The system can be used by organizations for succession planning, training and professional development, however it does not directly improve organizational performance. (Das and Panda, 2015) reported slightly different findings, stating that 360 degree feedback system is in fact perceived very positively by staff in educational institutions.

5. Conclusion

The entire discussion indicates the relevance of performance measurement methods in contemporary organizations. The review of the different performance measurement methods included in the study reveal that every method has its own advantages and disadvantages hence, the choice should depend upon the needs of the organization and the purpose behind employing the performance measurement methods. If appropriately used, performance measurement methods can act as great tools to enhance employee performance and organizational productivity. However, if not employed effectively, the performance measurement tools can also lead to conflicts and chaos in the organization, hampering the overall well-being of the organization in the long run. The review also reveals the gap in

existing literature about the particular performance measurement methods discussed under the study. While a few like balanced scorecard have been the researchers' favorite, other methods like EFQM and 360-degree feedback system have been met with mixed reviews. This is the reason behind a dearth of literature on these methods.

As stated previously, the review undertaken in this paper reveals that the performance measurement methods except balanced scorecard have been under-explored. There is a need to study other performance measurement methods from varied aspects, inter-industry and intra-industry. Particular case study-based researches can also be very helpful to understand the application, benefits, and challenges associated with each of the methods.

REFERENCES

Adler, S., Campion, M., Colquitt, A., Grubb, A., Murphy, K., Ollander-Krane, R., & Pulakos, E. D. (2016). Getting rid of performance ratings: Genius or folly? A debate. *Industrial and Organizational Psychology*, *9*(2), 219–252. https://doi.org/10.1017/iop.2015.106

Ahmed, A., & Ramzan, M. (2013). Effects of Job Stress on Employees Job Performance A Study on Banking Sector of Pakistan. *IOSR Journal of Business and Management*, *11*(6), 61–68.

Baroda, S., Sharma, C., & Bhatt, J. K. (2012). 360 Degree Feedback Appraisals An Innovative Approach of Performance Management System. *International Journal of Management & Information Technology*, *1*(2), 53–66.

Bayo-Moriones, A., Merino-Díaz-De-Cerio, J., Antonio Escamilla-De-León, S., & Mary Selvam, R. (2011). The impact of ISO 9000 and EFQM on the use of flexible work practices. *International Journal of Production Economics*, *130*(1), 33–42. https://doi.org/10.1016/j.ijpe.2010.10.012

Beard, D. F. (2009). Successful Applications of the Balanced Scorecard in Higher Education. *Journal of Education for Business*, *84*(5), 275–282. https://doi.org/10.3200/JOEB.84.5.275-282

Benavides-Velasco, C. A., Quintana-García, C., & Marchante-Lara, M. (2014). Total quality management, corporate social responsibility and performance in the hotel industry. *International Journal of Hospitality Management*, *41*, 77–87. https://doi.org/10.1016/j.ijhm.2014.05.003

Bhagwat, R., & Sharma, M. K. (2007). Performance measurement of supply chain management: A balanced scorecard approach. *Computers and Industrial Engineering*, *53*(1), 43–62. https://doi.org/10.1016/j.cie.2007.04.001

Biron, M., Farndaljaap, E., & Paauwe, J. (2011). Performance management effectiveness: Lessons from world-leading firms. *International Journal of Human Resource Management*, *22*(6), 1294–1311. https://doi.org/10.1080/09585192.2011.559100

Bonn, J., Agyeman, B., & Osei, C. (2017). Using Balanced Scorecard for Managing Performance in Selected Ghanaian Banks. *International Journal of Business and Management*, *12*(12), 204–211.

Chavan, M. (2009). The balanced scorecard: a new challenge. *Journal of Management Development*, *28*(5), 393–406. https://doi.org/10.1108/02621710910955930

Chia, A., Goh, M., & Hum, S. H. (2009). Performance measurement in supply chain entities: Balanced scorecard perspective. *Benchmarking*, *16*(5), 605–620. https://doi.org/10.1108/14635770910987832

Chirasha, V., Chipunza, C., & Dzimbiri, L. (2018). Measuring employee performance in Gweru and Kwekwe city councils in midlands province, Zimbabwe. *African Journal of Business Management*, *12*(16), 509–517. https://doi.org/10.5897/AJBM2017.8484

Das, U. K., & Panda, J. (2015). A Study on 360-Degree Feedback In Educational University With Reference To Bhubaneswar, Odisha, India. *International Journal of Science and Research*, *4*(4), 1632–1634.

Denisi, A. S., & Murphy, K. R. (2017). Performance appraisal and performance management: 100 years of progress? *Journal of Applied Psychology*, *102*(3), 421–433. https://doi.org/10.1037/apl0000085

Filipova, M. (2010) Decision Making System, *Scientific journal Economics and management, Issue 4, 2010, 25-32. ISSN (print): 1312-594X, ISSN (online): 2367-7600*

Gupta, B., & Parmar, D. S. (2018). EFFECT OF PERFORMANCE APPRAISAL ON EMPLOYEEPRODUCTIVITY IN AN AUTOMATION SOLUTION COMPANY. *Journal of Management Research and Analysis*, *5*(2), 151–157.

Hoang, V. T., Dinh, H. N., Tran, M. D., & Nguy, T. H. (2018). DETERMINANTS INFLUENCING THE USAGE OF BALANCED SCORECARD FOR PERFORMANCE MEASUREMENT: THE CASE OF VIETNAM. *Academy of Accounting and Financial Studies Journal*, *22*(6), 1–15.

Iqbal, N., Ahmad, N., Khan, D. G., Zeeshan Haider, P., & Batool, Y. (2013). Impact of performance appraisal on employee's performance involvingthe Moderating Role of Motivation. In *Arabian Journal of Business and Management Review (OMAN Chapter* (Vol. 3).

Islami, X., Mulolli, E., & Mustafa, N. (2018). Using Management by Objectives as a performance appraisal tool for employee satisfaction. *Future Business Journal*, *4*(1), 94–108. https://doi.org/10.1016/j.fbj.2018.01.001

Jenabagha, N., Gorji, M., & Siami, S. (2011). Organizational Performance Assessment Based on Excellence Model (EFQM) in the Fields of Staff and Customers Results. *2011 International Conference on Management and Service Science*. Singapore: IACSIT Press.

Kaplan, R. S. (2010). *Conceptual Foundations of the Balanced Scorecard*. Boston, MA.

Karimi, R., Malik, M. I., & Hussain, D. S. (2011). Examining the Relationship of Performance Appraisal System and Employee Satisfaction. *International Journal of Business and Social Science*, *2*(22), 243–247.

Kucharčíková, A., Mičiak, M., & Hitka, M. (2018). Evaluating the effectiveness of investment in human capital in e-business enterprise in the context of sustainability. *Sustainability (Switzerland)*, *10*(9). https://doi.org/10.3390/su10093211

Mazzei, M. J., Flynn, C. B., & Haynie, J. J. (2016). Moving beyond initial success: Promoting

innovation in small businesses through high-performance work practices. *Business Horizons*, *59*(1), 51–60. https://doi.org/10.1016/j.bushor.2015.08.004

Meduoye, O., & Mbah, S. I. (2019). BALANCED SCORECARD AND ORGANISATIONAL PERFORMANCE IN SELECTED BANKS IN ANAMBRA STATE. *Global Journal of Education, Humanities & Management Sciences*, *1*(2).

Patel, P. C., & Conklin, B. (2012). Perceived Labor Productivity in Small Firms-The Effects of High-Performance Work Systems and Group Culture Through Employee Retention. *Entrepreneurship Theory and Practice*, *36*(2), 205–235. https://doi.org/10.1111/j.1540-6520.2010.00404.x

Roussas, S., & McCaskill, A. D. (2015). The Balance Scorecard versus Traditional Measurement System. *American Journal of Management*, *15*(3), 36–42.

Selvarasu, D. ., & Sastry, N. S. K. (2014). A Study of Impact on Performance Appraisal on Employee's Engagement in an Organization. *International Journal of Managerial Studies and Research*, *2*(11), 10–22.

Seyedi, S. A., Ashtari, G. R., & Zahiri, M. (2015). Investigating the relationship between the Establishments of organizational Excellence system based on the EFQM model and employee performance (Case study: Company of Karun oil and gas operations). *International Journal of Humanities and Cultural Studies, Special Is*, 1302–1319.

Shen, Y. C., Chen, P. S., & Wang, C. H. (2016). A study of enterprise resource planning (ERP) system performance measurement using the quantitative balanced scorecard approach. *Computers in Industry*, *75*, 127–139. https://doi.org/10.1016/j.compind.2015.05.006

Srikanth, P. B., & Jomon, M. G. (2013). ROLE AMBIGUITY AND ROLE PERFORMANCE EFFECTIVENESS: MODERATING THE EFFECT OF FEEDBACK SEEKING BEHAVIOUR. In *Asian Academy of Management Journal* (Vol. 18).

Stefanović, N., & Stefanović, D. (2011). Supply Chain Performance Measurement System Based on Scorecards and Web Portals. *Computer Science and Information Systems*, *8*(1), 167–170.

Tahsildari, A., & Shahnaei, S. (2015). Enhancing Organizational Effectiveness by Performance Appraisal, Training, Employee Participation, and Job Definition. In *European Journal of Business and Management* (Vol. 7). Online.

U. S. Department of Health and Human Services. (2011). *PERFORMANCE MANAGEMENT AND MEASUREMENT*. Maryland.

Westover, J. H., Westover, A. R., & Westover, L. A. (2010). Enhancing long-term worker productivity and performance: The connection of key work domains to job satisfaction and organizational commitment. *International Journal of Productivity and Performance Management*, *59*(4), 372–387. https://doi.org/10.1108/17410401011038919

Zondo, R. (2018). The influence of a 360-degree performance appraisal on labour productivity in an automotive manufacturing organisation. *South African Journal of Economic and Management Sciences*, *21*(1), 1–7.

Димитрова, Р. (2014). Мониторинг на конкурентоспособността на предприятието. УИ "Неофит Рилски", Благоевград, с. 5-6. [Dimitrova, R. (2017). Monitoring na konkurentosposobnostta na predpriyatieto. UI "Neofit Rilski", Blagoevgrad, s. 5-6.]

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DECISIONS AND SKILLS OF THE STRATEGIC LEADERS

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Abstract

Strategic leaders are known for thinking ahead, preparing for succession, and implementing a strategy. If companies are struggling in these areas, then it would make sense to take a look at bringing in a strategic leader.

Strategic leaders do not make decisions or move forward without running decisions through a strategic lens. They are disciplined in always keeping the objective first. They will not make a quick decision, but they will decide if it fits with the short and long-term goals of the company.

Strategic leadership links the personal attributes of the leader with their professional knowledge and experience. Because strategy is no longer a top-down activity but is the responsibility of many people within an organization, demanding a culture of strategic innovation and openness, leaders must be able to connect their leadership imperative with the culture and practice of the wider organization, thereby delivering sustained impact and influence through individuals, teams and business units.

Keywords: *strategic leaders, strategic leadership, decisions, skills, companies*
JEL Codes: *M1*

1. Introduction

Strategic leadership refers to a manager's potential to express a strategic vision for the organization, or a part of the organization, and to motivate and persuade others to acquire that vision. Strategic leadership can also be defined as utilizing strategy in the management of employees. It is the potential to influence organizational members and to execute organizational change. Strategic leaders create organizational structure, allocate resources and express strategic vision. Strategic leaders work in an ambiguous

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environment on very difficult issues that influence and are influenced by occasions and organizations external to their own.

The main objective of strategic leadership is strategic productivity. Another aim of strategic leadership is to develop an environment in which employees forecast the organization's needs in context of their own job. Strategic leaders encourage the employees in an organization to follow their own ideas. Strategic leaders make greater use of reward and incentive system for encouraging productive and quality employees to show much better performance for their organization. Functional strategic leadership is about inventiveness, perception, and planning to assist an individual in realizing his objectives and goals.

Leaders who develop the strategies that drive a business are also required to have a bird's eye view of the company, as well as an intimate understanding of how everything in the business is interconnected. They need to understand such things as the expectations of the stakeholders, the needs of the customers, the competitive landscape, the global trends, the environment within which the business operates and so on.

Strategic leadership is the ability to influence others to voluntarily make decisions that enhance the prospects for the organization's long-term success while maintaining short-term financial stability. Different leadership approaches impact the vision and direction of growth and the potential success of an organization. To successfully deal with change, all executives need the skills and tools for both strategy formulation and implementation (May, R. (n.d.)). Managing change and ambiguity requires strategic leaders who not only provide a sense of direction, but who can also build ownership and alignment within their workgroups to implement change (Fulmer, R., Stumpf, S., Bleak, J., 2009, pp.17-22).

2. Strategic leadership

Leadership has a significant role play in the formation and carrying out of strategies. It is termed as a linkage which connects the strategic management process with the aim and vision of the organization (Jabbar, A. A., Hussein, M., A., 2017, p.104).

„We can't solve problems using the same kind of thinking we used when we created them". The quote by Albert Einstein perfectly captures the need of strategy and the essence of strategic leadership. In order to solve problems and move forward, people need to interpret the world around them with a fresh insight and vision. While it's easy to think that most leaders would go ahead with a strategy, all too often the idea of the strategic leadership framework is misunderstood as simply having a plan of action. The leadership style is much more than just an idea of how to implement certain policies or processes.

Whole organizations performance depends upon leadership (Loren & Matthew, 2008). Strategic leadership requires the potential to foresee and comprehend the work

environment. It requires objectivity and potential to look at the broader picture. A few main **traits/ characteristics/features/qualities** of effective strategic leaders that do lead to superior performance are as follows:

a) Loyalty - Powerful and effective leaders demonstrate their loyalty to their vision by their words and actions.

b) Keeping them updated - Efficient and effective leaders keep themselves updated about what is happening within their organization. They have various formal and informal sources of information in the organization.

c) Judicious use of power - Strategic leaders makes a very wise use of their power. They must play the power game skillfully and try to develop consent for their ideas rather than forcing their ideas upon others. They must push their ideas gradually.

d) Wider perspective/outlook - Strategic leaders just don't have skills in their narrow specialty but they have a little knowledge about a lot of things.

e) Motivation - Strategic leaders must have a zeal for work that goes beyond money and power and also they should have an inclination to achieve goals with energy and determination.

f) Compassion - Strategic leaders must understand the views and feelings of their subordinates, and make decisions after considering them.

g) Self-control - Strategic leaders must have the potential to control distracting/disturbing moods and desires, i.e., they must think before acting.

h) Social skills - Strategic leaders must be friendly and social.

i) Self-awareness - Strategic leaders must have the potential to understand their own moods and emotions, as well as their impact on others.

j) Readiness to delegate and authorize - Effective leaders are proficient at delegation. They are well aware of the fact that delegation will avoid overloading of responsibilities on the leaders. They also recognize the fact that authorizing the subordinates to make decisions will motivate them a lot.

k) Articulacy - Strong leaders are articulate enough to communicate the vision (vision of where the organization should head) to the organizational members in terms that boost those members.

l) Constancy/ Reliability - Strategic leaders constantly convey their vision until it becomes a component of organizational culture.

To conclude, strategic leaders can create vision, express vision, passionately possess vision and persistently drive it to accomplishment.

3. Decisions of the strategic leaders

One of the major role of strategic management is to incorporate various functional areas of the organization completely, as well as, to ensure these functional areas harmonize and get together well (Stamevska, E., Dimitrieska, S., Stankovska, A., 2019,

p.60). Strategic leaders carry strategic decisions that relate to whole environment in which the firm operates, the entire resources, the people who work in the company and the interface between them.

Characteristics of strategic decisions:

a) Strategic decisions have major resource propositions for an organization. These decisions may be concerned with possessing new resources, organizing others or reallocating others.

b) Strategic decisions deal with harmonizing organizational resource capabilities with the threats and opportunities.

c) Strategic decisions deal with the range of organizational activities. It is all about what they want the organization to be like and to be about.

d) Strategic decisions involve a change of major kind since an organization operates in ever-changing environment.

e) Strategic decisions are complex in nature.

f) Strategic decisions are at the top most level, are uncertain as they deal with the future, and involve a lot of risk.

g) Strategic decisions are different from administrative and operational decisions.

Administrative decisions are routine decisions which help or rather facilitate strategic decisions or operational decisions. Operational decisions are technical decisions which help execution of strategic decisions. To reduce cost is a strategic decision which is achieved through operational decision of reducing the number of employees and how we carry out these reductions will be administrative decision.

The differences between Strategic, Administrative and Operational decisions can be summarized as follows table.

Table 1: The differences between Strategic, Administrative and Operational decisions

Strategic Decisions	Administrative Decisions	Operational Decisions
Strategic decisions are long-term decisions.	Administrative decisions are taken daily.	Operational decisions are not frequently taken.
These are considered where The future planning is concerned.	These are short-term based Decisions.	These are medium-period based decisions.
Strategic decisions are taken in Accordance with organizational mission and vision.	These are taken according to strategic and operational Decisions.	These are taken in accordance with strategic and administrative decision.
These are related to overall Counter planning of all Organization.	These are related to working of employees in an Organization.	These are related to production.
These deal with organizational Growth.	These are in welfare of employees working in an organization.	These are related to production and factory growth.

4. Skills of the strategic leaders

Leadership is responsible to direct the subordinates to perform the organizational tasks effectively (Holloway, M., 2011). For strategic leaders to be successful, it needs to start with an understanding of the internal factors as well as the external factors that determine the success of the company, whether short term or long term. That understanding needs to be both honest and clear.

The relevance of strategic leaders is all about strategy, and so it will require strategy. They must have the ability to be abstract in the theoretical world of business analysis and also to be practical in business strategy. Strategic leaders should be able to look at the business analysis, so that can identify the opportunities that the analysis reveals. They should then be able to choose the opportunities that they will follow, so that they can then develop a unique strategy, which defines how the business will leverage the opportunities, so that he will become successful.

The leader should be a strong enough to be able to implement the business strategy in the company. These leaders need to engage with the stakeholders of the company, both internally and externally, and be aware of the challenges that face strategic implementation. Additionally, they should be skilled enough leaders to overcome those challenges.

In theory, at least, it is possible to master all of the **skills** that strategic leaders requires, simply by gaining experience on the job. However, this is impractical and slow, at best. It is important to develop a training program for strategic leadership. This training should also be conducted under the guidance of a strategic leader expert.

- ✓ **Understanding** - The good strategic leaders course, give an intimate understanding of the way the business environment today is both interconnected and global.
- ✓ **Development** - The good strategic leaders course is opportunity to develop the strategic thinking skills, especially in relation to the way the business operates within its immediate and greater environment.
- ✓ **Identification** - Good training in strategic leaders give the ability to quickly and easily identify opportunities for the company in its immediate as well as greater business environment.
- ✓ **Creation** - The good strategic leaders course teach how to create strategies that are both effective and efficient in the leveraging of the opportunities which you identify for the business.
- ✓ **Management** - As would be expected, good training in strategic leaders is the ability to manage both the team and the organization as a whole, as it moves forward to achieve the goals of the strategic plan.

The best kind of training in strategic leadership give the ability to work directly on the issues that affect the business. Good training also provide with the necessary leadership skills that will help to execute the business strategies.

5. Conclusion

Most organizations and leaders are poor at detecting ambiguous threats and opportunities on the periphery of their business. Strategic leaders, in contrast, are constantly vigilant, honing their ability to anticipate by scanning the environment for signals of change.

In uncertain times, decision makers may have to make tough calls with incomplete information, and often they must do so quickly. But strategic leaders insist on multiple options at the outset and don't get prematurely locked into simplistic go/no-go choices. They follow a disciplined process that balances rigor with speed, considers the trade-offs involved, and takes both short- and long-term goals into account. In the end, strategic leaders must have the courage of their convictions informed by a robust decision process.

Strategic thinkers challenge their own and others' assumptions and encourage divergent points of view. Only after careful reflection and examination of a problem through many lenses do they take decisive action. This requires patience, courage, and an open mind. Strategic leaders are the focal point for organizational learning. They promote a culture of inquiry, and they search for the lessons in both successful and unsuccessful outcomes. They study failure their own and their teams' in an open, constructive way to find the hidden lessons.

REFERENCES

Cole, M. S., Bedeian, A. G., Bruch, H. (2011). Linking leader behavior and leadership consensus to team performance: Integrating direct consensus and dispersion models of group composition. Leadership Quarterly, 22.

Fairholm, M. R. (2004). Different perspectives on the practice of leadership. Public administration review, 64(5).

Fulmer, R., Stumpf, S., Bleak, J. (2009). The strategic development of high potential leaders. Strategy & Leadership, 37(3), pp.17-22.

Jabbar, A. A., Hussein, M., A. (2017). The role of leadership is strategic management, International journal of research - Granthaalayah, 5(5), p.104 https://doi.org/10.5281/zenodo.583890.

Holloway, M. (2011). The role of leadership in translating strategy into execution, a presentation in SHRM conference.

Loren & Matthew. (2008). What senior leaders do: nine roles of strategic leadership, Journal of DDI.

May, R. (n.d.). Strategic Leadership for Executives. BusinessDictionary.com - Online Business Dictionary. http://www.businessdictionary.com/article/682/strategic-leadership-for-executives/

Stamevska, E., Dimitrieska, S., Stankovska, A (2019). Role, importance and benefits of strategic management, Economics and Management, Faculty of Economics, SOUTH-WEST UNIVERSITY "NEOFIT RILSKI", BLAGOEVGRAD, vol. 16(2), pp.58-65 http://em.swu.bg/images/SpisanieIkonomikaupload/Spisanieikonomika2019/ROLE%20IMPORTANCE%20AND%20BENEFITS%20OF%20STRATEGIC.pdf

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INFORMATIONAL METABOLISM OF THE IT SOCIETY

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Abstract

This article presents a study and analysis of the distribution of Socionics personality types in the IT community, covering different IT professionals from 6 countries. The integral psycho-informational metabolism of the IT society has been determined and proved by a socionic analysis of the statistical data, using different practices and tools. The conclusions drawn define the main peculiarities of the IT guild as well as the specific motivational, communication and value characteristics of the study group. The factors that differentiate IT people from the rest of the population are also analyzed. The illustrated methodology is applicable to studies of the behavioral characteristics of different communities, subcultures, social and minority groups, as well as various corporate units with integral informational metabolism.

The author assumes that the reader is familiar with the fundamentals, terminology and concepts of Socionics as well as Jungian theory.

Keywords: *IT-management, Socionics, informational metabolism, psycho-analysis, psychotype, Myers-Briggs Type Indicator*
JEL Codes: *A12, A14, L20, L29, M15, M59, Z13*

Introduction

Formed as a theory of personality types and relationships between them, the Socionics continues to develop rapidly during the new 21st century, as an interdisciplinary science, covering fields such as transpersonal psychology, social psychology, ethno-psychology and social anthropology.

Socionic analysis, along with the theory of Integral Socionics (Bukalov, 1998, 2009), is a powerful tool for exploring the psycho-information peculiarities of different systems and subsystems in society (nations, ethnicities, states, communities, subcultures, as well as social, religious and ethnic minority groups).

The factors of integration in each community are based on common values, properties and characteristics, and therefore are directly related to the integral informational metabolism.

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An interesting example of a characteristic subculture is the IT society, which is considered strange and incomprehensible by the rest part of humanity. In course of this article, the reasons for the intellectual and communication separatism of this community will be explored, as well as the different features and factors that set it apart from the social standards.

Social, literary and movies stereotypes for computer professionals, describe the ITs as poorly dressed and bespectacled people with communication problems. The clichés describe these folks as introverted and asocial who have strange and unpopular activities, passion for science fiction, comics, computer games and others. They are often unfriendly and arrogant, and when communicating with the opposite sex are inept and shy. The archetypal IT guy is poorly dressed, overweight/underweight, living in front of a computer screen, eating pizza and other junk food. The music IT-preferences are related to Heavy metal, Punk rock, Gothic rock or Classical music.

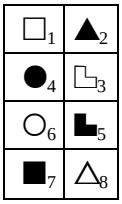
Regardless of whether the literary characters are positive or negative, they are highly intelligent (evil genius) with extremely non-standard and abstract thinking. They are characterized by a hatred of the status quo and social restrictions, often bordering on anarchism.

From a professional point of view, the key qualities required in information technology are related to structural logic, system architecture, various classifications, abstract thinking, ideas, concepts, prognostics, algorithm, problem solving, troubleshooting, innovations, thinking out of the box.

According to the Socionic outlook, the characteristics listed above correspond to the cognitive functions (information aspects) of introverted logic (□) and extroverted intuition (▲). The IT-community belongs to ***Alpha*** psycho-informational space, characterized by a democratic relationships, intense information exchange, disregard for the existing paradigms, intolerance to moral and moral constraints, curiosity to the new and unknown, theoretical and inventive activity, construction of logical structures, generation of original ideas and theories and others.

Considering the pronounced introverted nature of the IT community, the generally accepted stereotypical ideas about it and the required professional qualities in the IT industry, we can conclude that the integral informational metabolism of this sub-society corresponds to the type of INTJ whose informational - aspect model is described below (Gulenko, Molodsov,1991):

INTJ A-model



□ Introverted Thinking - Program function

They can reasonably and convincingly express their thoughts. They prefer compact, concise information, though inclined to extend it within acceptable limits. Well appreciate the capabilities of systems, formal models and concepts, clearly separating the essence from the insignificant.

▲ Extroverted Intuition - Creative Function

Able to generate ideas. Their thinking is extremely independent. Delving into the issues, they offer innovative solutions. Able to solve complex and unclear problems. The lack of facts compensates with imagination.

⌐ Introverted Feeling - Role function

Uncommunicative, difficult to build relationships with others. It is hard for them to be friendly and polite. They are indifferent to external criticism and are not afraid of negative attitude.

● Extraverted Sensing - Painful function

They strive for simple and democratic relationships. They are soft in nature and have no breakthrough power. They are in dire need of independence and privacy. Ignore violence and pressure, and therefore can't be forced to do something.

○ Introverted Sensing - Activation function

Humble in life, satisfied of minimal amenities. When household and material problems are solved, their energy rises - they move to tasks postponed for "better times". When they feel discomfort for long period, they begin to accumulate negative emotions.

▙ Extraverted Feeling - Suggestive function

Positive emotions relax and soothe them. They respond by becoming sociable and witty. In a close circle they are cheerful and welcoming. They show their own emotions only in a friendly company but usually are cold and distant.

△ **Introverted Intuition - demonstrative function**

At meetings and events they are always on time. They pride themselves on their accuracy and organization. They can be counted on to complete the tasks on time. They don't like wasting time hence they look for methods for time saving.

■ **Extraverted Thinking - Observation function**

They appreciate the prospects for new endeavors. They are not business-minded or entrepreneurial, but can recommend an unusually bold and successful solution. They select a personal approach based on accepted practices.

Below is the data supporting the hypothesis regarding the type of informational metabolism of the IT community. The data is from a survey conducted by the author. The surveyed group comprises of system administrators, hackers, DB administrators and software developers, and includes 80 IT professionals from 6 countries - Bulgaria, Serbia, Montenegro, Sweden, Denmark and USA.

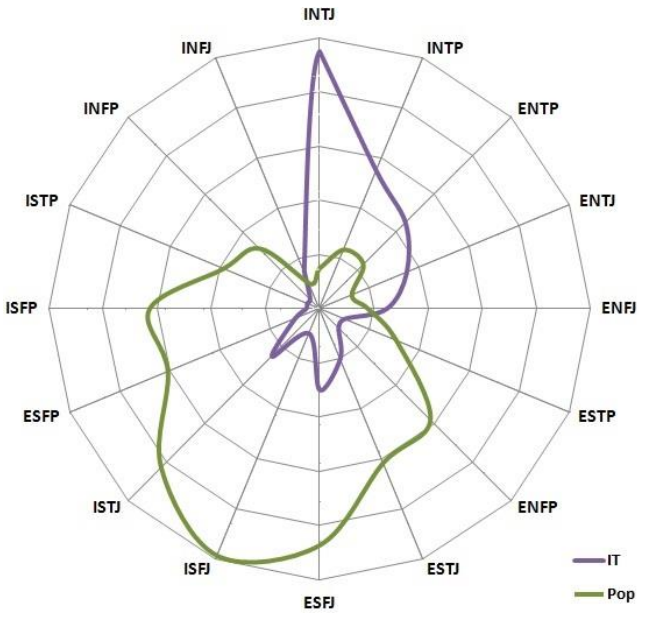
The research methodology includes a set of tools: test, interviews and ethnographic methods (observations in work and informal environment), which enables the typing of participants much more accurate than using a separate method.

The results of the study are presented in Table 1, together with the distribution of the population types (according to Statistic Brain Research Institute). Figure 1 presents graphically the data.

Table 1

Type	Pop. %	IT %
INTJ	2,10	23,75
INTP	3,30	13,75
ENTP	3,20	11,25
ENTJ	1,80	8,75
ENFJ	2,50	6,25
ESTP	4,30	2,50
ENFP	8,10	2,50
ESTJ	8,60	5,00
ESFJ	12,20	7,50
ISFJ	13,80	2,50
ISTJ	11,60	6,25
ESFP	8,50	2,50
ISFP	8,80	1,25
ISTP	5,40	1,25
INFP	4,40	1,25
INFJ	1,40	3,75

Figure 1



The results show a significant deviation of the IT psycho-informational profile relative to the percentage distribution of psychotypes in the population. Rare types with a frequency of 2-3% are significantly concentrated in the IT community.

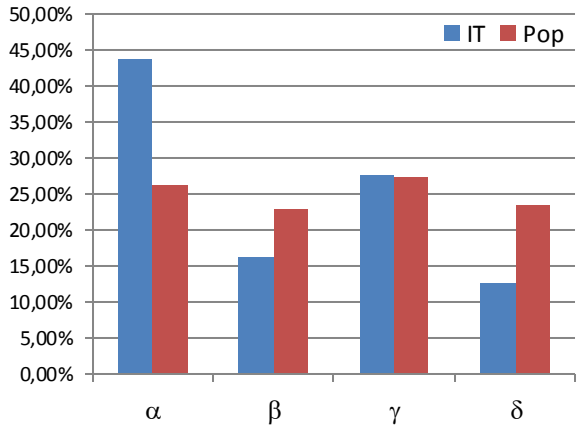
A deeper understanding of the nature of this disproportion can be achieved through "small groups" analysis.

Table 2 presents the data for quadra-distribution of IT specialists from the surveyed sample, along with the standard population distribution. Figure 2 presents this data graphically.

Table 2

Quadra	IT Community%	Population%
α	43,75	26,30
β	16,25	22,80
γ	27,50	27,40
δ	12,50	23,50

Figure 2



The analysis of the quadra composition shows that a significant part of IT specialists (43.75%) belong to α-quadra, which explains their non-standard thinking, tendency to create innovations, lack of prejudice, developed sense of justice, democratic relations, free sharing of information (especially in the open-source communities). In this sub-society the expressed intolerance to rules, restrictions, traditions and paradigms, exist. Here exists a cult of freedom of the spirit, continuous search for the absolute truth and yearning for new horizons of human knowledge.

The democratic character of the community is complemented by representatives of the γ-quadra (27.50%), who also do not tolerate restrictions, have a good appreciation of

prospects and trends, value individualism and independence, and value others on the basis of their personal qualities.

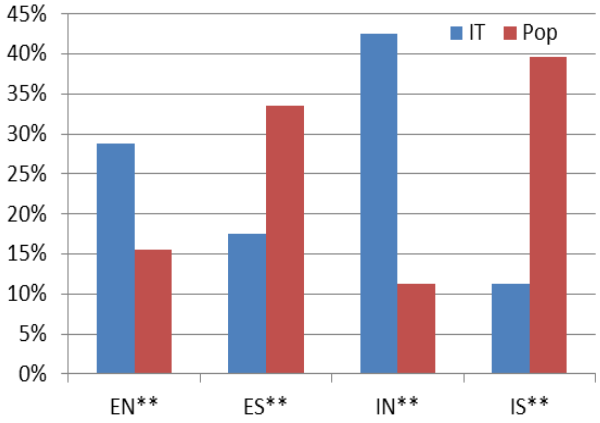
The analysis of the statistical data is divided into Gulenko-Udalova (Gulenko, 1995, 2009; Udalova, 2007) groups, which contributes to deeper understanding of the genesis of psycho-informational metabolism of the explored community, and the factors that have the most significant influence in its formation.

The distribution by motivation groups in the IT community also differs significantly from the standard distribution in the population. This segmentation of the data is illustrated by Table 3 and Figure 3.

Table 3

Motivation	IT Community%	Population%
EN**	28,75%	15,60%
ES**	17,50%	33,60%
IN**	42,50%	11,20%
IS**	11,25%	39,60%

Figure 3



The leading motivational factors in the IT community are "Self-sufficiency" (IN**) and "Uniqueness" (EN**), accounting over 70% of the stimuluses in the statistical sample.

The carriers of the basic motivational incentive "Self-sufficiency" (IN**) - appreciate the opportunity to indulge in what they consider to be significant. The inner world of ideas is at the top of their value system and adding value to it is the factor that drives them to a particular activity. Their incentives are personal curiosity, interest in the subject or the method and positive subjective evaluation of the task. Representatives of these types are characterized by modesty and unpretentiousness.

The second important motivating factor in the IT community is "Uniqueness" (EN**). In the value system of these psychotypes, the leading motivation is predetermined by qualities such as unusualness, perspective of the task, intellectual complexity and fascination. The pursuit of "non-standard" creates problems for these sociotypes and they are often perceived as weirdos or outsiders in society, regardless of their social status.

"Prestige" (ES**) and "Wealth" (IS**) incentives, which represent significant motivation among the population (> 63%), have considerably less influence on motivation in the IT community (29%). Social status, successful career, influence and power, attention and respect, financial security, confidence in tomorrow, order and comfortable living and working conditions do not represent much worth in the IT value system.

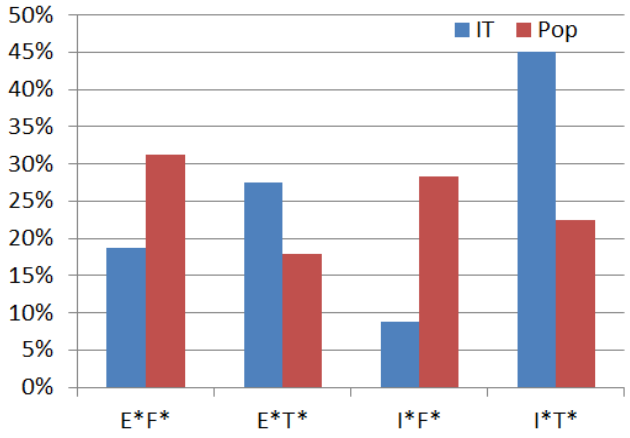
Particularly characteristic of the IT community is its communication specifics.

In corporate life, employees from other departments often complain about the uncommunicativeness and un-socialness of ITs and compare them to machines and robots. Most of the people find that IT guys cannot have a normal, human (non-engaging) conversation. ITs are cold, pragmatic, preferring written communication over business meetings (which are considered a waste of time). The reasons for these peculiarities can be illustrated by the statistics on communication styles of the studied community, presented in Table 4 and Figure 4.

Table 4

Communication	IT Community%	Population%
E*F*	18,75%	31,30%
E*T*	27,50%	17,90%
I*F*	8,75%	28,40%
I*T*	45,00%	22,40%

Figure 4



The most common communication styles in the IT community are "cool-blooded" (I*T*) and "business" (E*T*), totaling over 70% of the sample surveyed. The emotional communication attributed to the feeling types (E*F*) and (I*F*) is not characteristic of the representatives of the studied community.

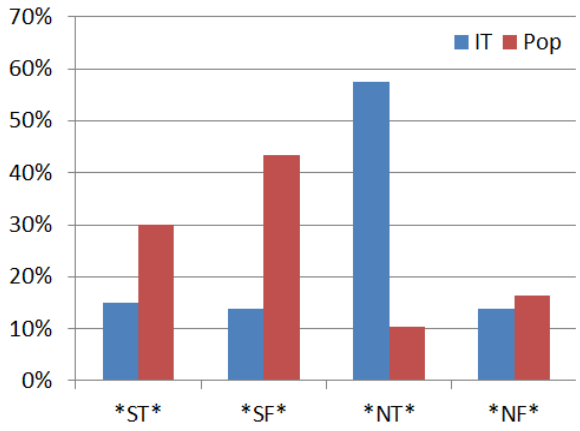
In full accordance with social stereotypes, most of the ITs are reserved and non-communicative. The communication in this guild is used to exchange missing information and passing it on in accordance with established standards and schemes. The position of communication excludes emotional character and is based mainly on operational needs. Written exchange of information is often preferred and perceived as more reliable.

Club affiliation of ITs is particularly characteristic. Of all the segregations of the statistics data, the most significant deviation from the standard population distribution is observed here:

Table 5

Club	IT Community%	Population%
ST	15,00%	29,90%
SF	13,75%	43,30%
NT	57,50%	10,40%
NF	13,75%	16,40%

Figure 5



About 60% of the surveyed IT professionals belong to the Researchers club (*NT*), compared to about 10% of the general population.

Therefore in club distribution, there is a significant concentration of “rare elements” in the IT community.

More specifically here exist curiosity for solving unsolved problems and structuring solutions in exact laws. "Researchers" are gifted with holistic view of their problems of interest, an accurate and clear view of the causal relationships and structures of the world around us, a constant search for the objective truth achieved through the means of reason. Moreover, the creation of interconnections, systems and classifications is a completely natural process for the *NT* temperament. The representatives of this group are attracted by the unknown and the unusual, by the general principles, but not by the practical and applied values of their activities. The discussions at this club are extremely open and democratic. "Researchers" value a person for their intelligence, which is why they do not respect hierarchy, regalia and authority. For these people, continuous challenge of laws, orders and rules, is more than usual behavior.

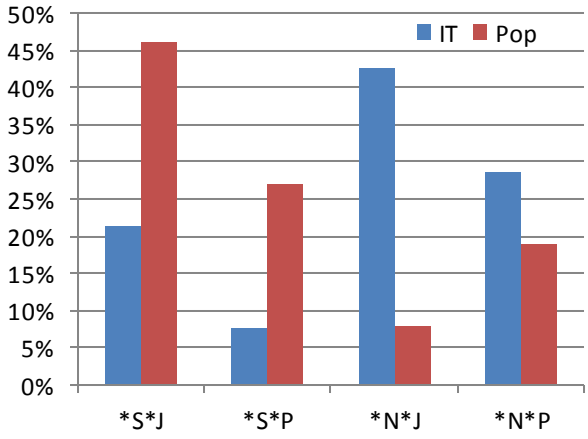
This club unites scientists, inventors, discoverers and innovators. Regardless of their particular profession, original methods, non-standard solutions and creative approaches are present in their work. Here the idea and content are valued more than the practicality and the form.

Another characteristic of the IT community is the life strategies, the data for which is presented in Table 6 and graphically presented in Figure 6.

Table 6

Strategy	IT Community%	Population%
***S*J**	21,25%	46,20%
***S*P**	7,50%	27,00%
***N*J**	42,50%	7,80%
***N*P**	28,75%	19,00%

Figure 6



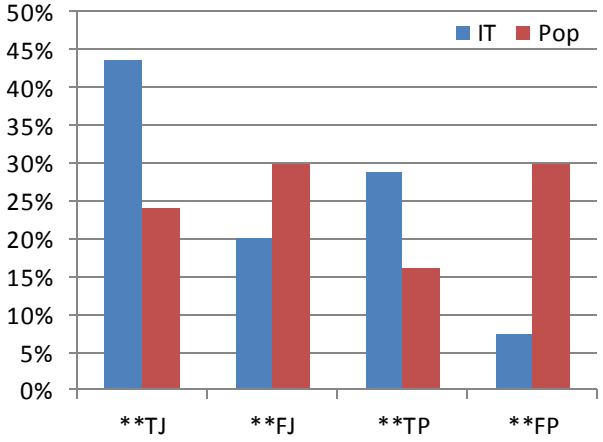
In the IT community, dominant strategies are formed mainly by the judging and perceiving intuits (*N*J) and (*N*P), who in total exceed 70% of the explored group. This is why the IT guild is distinguished by idealism on the one hand and flexibility on the other. The focus is on avoiding possible ways that require compromise with the views and the values of the community. Strategy (*N*J) is the bearer of the inductive component of the IT society and has a leading role in creating structures and defining laws, whereas (*N*P) is the bearer of the deductive component and a catalyst for creating innovation, demand on unfamiliar roads and new opportunities. Thus, the mix that is obtained, leads to the stability of ideals on the one hand and the flexibility of methods on the other.

The distribution of life missions describing the ideological foundations, the "right direction" and the idea of a decent life position are presented in Table 7 and Figure 7.

Table 7

Mission	IT Community%	Population%
****TJ**	43,75%	24,10%
****FJ**	20,00%	29,90%
****TP**	28,75%	16,20%
****FP**	7,50%	29,80%

Figure 7



The IT community is dominated by two life missions - Traditionalists (**TJ) and Experimenters (**TP).

Traditionalists are prone to persistent and accurate activities based on time-tested and proved recipes. Their worldview is based on respect for science and established concepts. They are critical of the new methods and rules and only adopt them after repeated reviews. They are cautious about reforms and resist if they see a risk to an

already established and working system. That mission is based on minimizing the risk and the chance of failure.

Experimenters are distinguished by their continuous, analytical search for new methods and concepts, unpaved paths, ingenuity, criticality to paradigms, etc. These types are learning and discovering new laws and technologies with interest, not allowing established methods and instructions to impede their creativity. They find satisfaction especially in solving the most complex tasks and cases.

These two missions have a significant impact on the professional work of the IT community and can cause some inconsistency of the quality of the end product. Tasks can be performed with perfect quality, as well as neglected due to the presence of more interesting projects.

Also, the existence of two distinct strategic cores is the main reason for internal community conflicts and conflicts regarding the applied methods.

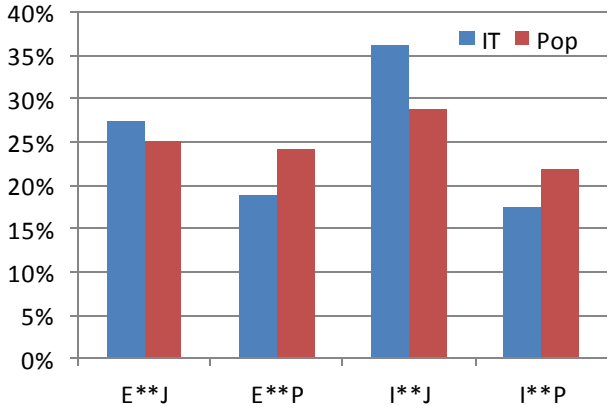
On the other hand, given the other features of IT society (democratic expression of ideas, constructive dialogue, striving for non-standard and original thinking, etc.), no real conflict is expected. Innovations are applied on a consensual basis, but only when they sustain criticism of rational arguments and prove their applicability and lack of risks for the working systems.

The statistics on emotional intelligence types of the IT community, compared to the population are presented in Table 8 and Figure 8.

Table 8

Em. Intelligence	IT Community%	Population%
EJ**	27,50%	25,10%
EP**	18,75%	24,10%
IJ**	36,25%	28,90%
IP**	17,50%	21,90%

Figure 8



Emotional intelligence in the IT community is dominated by balanced (I**J) types (36%). They are characterized by emotional distance and constant working capacity, which are slightly dependent on external factors. These people are confined and restrained. They have good self-control over their own emotions. They are moderate and consistent in their wishes and actions. They avoid interference in other's affairs and overreact to interference in their affairs.

The analysis by dichotomies of the studied community compared to population distribution is shown in Table 8 and visualized in Figure 8.

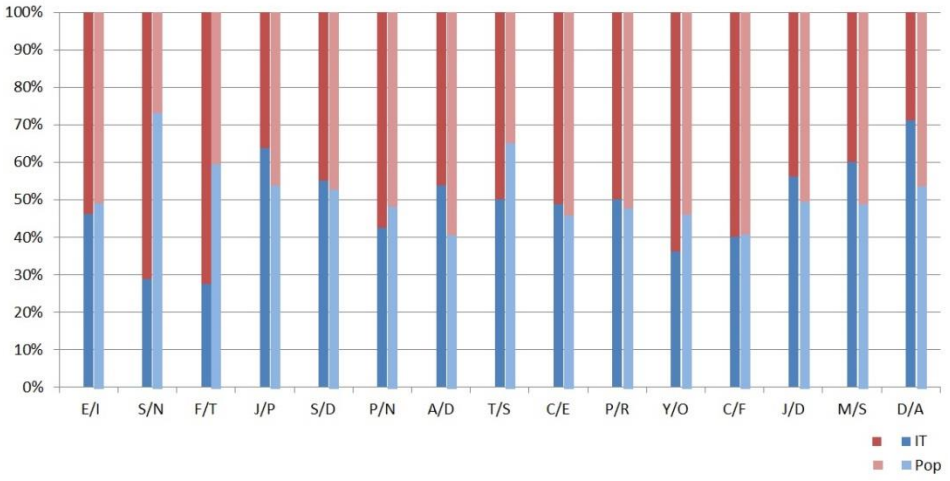
Table 8

%	E	I	S	N	F	T	J	P	S	D
IT	46,25%	53,75%	28,75%	71,25%	27,50%	72,50%	63,75%	36,25%	55,00%	45,00%
Pop.	49,20%	50,80%	73,20%	26,80%	59,70%	40,30%	54,00%	46,00%	53,00%	47,00%

%	P	N	A	D	T	S	C	E	P	R
IT	42,50%	57,50%	53,75%	46,25%	50,00%	50,00%	48,75%	51,25%	50,00%	50,00%
Pop.	48,50%	51,50%	40,75%	59,25%	65,20%	34,80%	46,10%	53,90%	47,90%	52,10%

%	Y	O	C	F	J	D	M	S	D	A
IT	36,25%	63,75%	40,00%	60,00%	56,25%	43,75%	60,00%	40,00%	71,25%	28,75%
Pop.	46,30%	53,70%	41,10%	58,90%	49,80%	50,20%	49,10%	50,90%	53,70%	46,30%

Figure 8



The results show the most significant deviation of the IT community by the Jungian dichotomies S/N and F/T.

Intuitive types are known to perceive the overall picture better than its details. Receiving sensory information, they transform it into abstractions, dependencies and

regularities. The facts are going on the background and the focus of the intuitive perception is oriented toward the significance of those facts.

Thinking personality types make decisions based on objective criteria. They are analytical, logical, consistent and impartial in their assessments. They strive for clarity and fairness in the criteria for decision making.

From the analysis made, it can be concluded that in the formation of the integral informational metabolism of the studied group, leading role is played by Jungian and group traits.

The differentiation of the explored set is not considerably pronounced on basis of Rainin traits (Rainin, 2010) and the distribution is comparable to that in the population for the most of dichotomies:

Static/Dynamic,
Positivist/Negativist,
Asking/Declaring,
Tactical/Strategic,
Constructivist/Emotivist,
Process/Result,
Yielding/Obstinate,
Carefree/Farsighted.
Judicious/Decisive,
Merry/ Serious,
Democracy/Aristocracy

The most significant difference compared to the general population is observed with the Democracy/Aristocracy trait. Indeed, in the IT community, status and titles are not particularly relevant. The assessment of others is based on their personal qualities and mainly on their knowledge and competencies, not on their caste, social group or professional guild membership.

The results of the analysis describe in detail the characteristics of the studied community and prove compliance of the integral informational metabolism to type INTJ. It should be noted that in addition to the stable nucleus, there are certain concentrated impurities that "paint" the collective character. These conglomerates of types have a significant influence on the collective psycho picture and their consideration contributes to a more detailed and in-depth understanding of integral psychoinformational groups.

If the 16 psychotypes are the notes of the Socion, then the small groups are corresponding to different chords with specific sound. The stronger the presence of each of them in the integral group, the more pronounced is its influence in the overall harmony.

Respectively, the term "integral personality" *(iSelf)* can be formulated, which is described by "impurities" creating the unique character of each integral group and define the differences between two communities with the same type informational metabolism. Moreover, terms such as "the team spirit", "the company spirit", "the national spirit", etc. would be fulfilled with substantially more specific semantic content.

It should be noted that integral IT informational metabolism is not a static structure and has some dynamics.

Old-school hackers and system administrators are predominantly of the INTP and INTJ types, while extroverted types are prevalent among the new generation (under 35). This trend is probably due to the dynamics of business environment and the changing demands for IT-industry globally.

On one hand, the mature companies are more focused on soft skills, whereby communication skills are gaining in importance over technical skills.

On the other hand, there is a demystification of information technology in the new millennium, and more "humanitarian" types targeting this profession. The reasons are diverse and include rapid development of informational technologies, accessibility of information, the prestige of the IT industry, attractive remuneration, as well as various educational policies designed to meet the shortage of IT professionals in the industry. As a result, information technologies are beginning to attract "uncharacteristic" (other than *NT*) types with different motivational factors such as well-being and prestige.

Also, the exacerbated competition requires increasing business flexibility, rapid responses and changes of corporate strategies, innovative solutions and revolutionary products.

All this can lead to a recent change of the IT integral type from INTJ to its mirror type - ENTP.

INTJ → ENTP
□▲ → ▲□

Such a transformation would keep in significant degree the psycho-informational exchange of the IT community, but would change the focus from the *impanse* (internal developement) of theoretical activity to the expanse of ideas potential. As a result, we will see an increase in the number of developments, many bold and original solutions, new methods, etc. Unfortunately, increased flexibility and variety of methods will be at the expense of the quality of realization and the degree of completion of ideas.

New developments will follow the ideas and will not be based on the existing technological methods. This will lead to significant dynamics in the IT sector and an abundance of new products and services, which will intensify the competition between companies.

Such kind of trend is already observed and the competitive advantages in IT business are related to rapid reaction and flexibility too. The IT world is beginning to reorient itself to Agile methodologies that rely on factors such as: customer satisfaction, close collaboration, direct communication, delegation of responsibilities, high staff motivation, facilitation of processes, self-organizing teams, rapid adaptation to circumstances and others.

An interesting feature of these methods is the work of sprints - a natural approach for the perceiving psycho-types.

Another example of flexible behavior is the SCRUM methodology, which assumes that the specifications and requirements of each project are subject of change due to

inaccuracies in the original assignment or changes made by the client. Therefore the focus of this approach is on the ability of IT teams to respond to sudden and unexpected changes.

CONCLUSIONS

1) All features of the IT community can be extracted from its integral TIM (type of informational metabolism). Differential analysis (small group distribution) gives a very good idea about the nature of the group psyche, as well as the processes in an integral community.

2) The integral TIM is a dynamic category, which unlike the individual TIM, can be influenced and altered by various factors and processes.

3) In the dynamics of the IT society there is a certain tendency for "humanization" of the industry, which will lead to a transformation of the integral IT-TIM from INTJ to ENTP.

4) The group psyche contains sub-structures (conglomerates of psychotypes) that cause differences between two integral communities with the same TIM and are attributes of the integral Self *(iSelf)*.

5) Most significant influence on formation of the integral IT-TIM have affiliation to Quadra (alpha) and Club (*NT*).

6) There is significant differentiation in the IT community on Jungian dichotomies N/S and F/T, while the traits of Rainin show little deviation with the population and can be treated as secondary factors in the formation of integral IT-TIM.

SUMMARY

The IT community has a unique character, predetermined by its integral psycho-informational metabolism. This society is characterized by a democratic attitude, a lack of prejudice, a free exchange of ideas and an intolerance of restrictions on the free spirit.

The most characteristic features of this guild are related to the interest in the non-standard and the unusual, solving puzzles, searching for original and unpaved roads. The IT community lives in a world of abstract ideas and precise logical structures. Therefore, creating, innovating, solving problems and defining exact laws are all natural processes for this guild. This is due to a holistic view on the problems of interest and an accurate picture of the causal relationships and structures in the inner and outer world. Intellectual challenges, non-standard ideas, original methods, creative solutions, innovative approaches and democratic discussions are the basic values in the IT society.

The main motivation of these people is related to personal curiosity, unusualness, the perception of the task, intellectual complexity and fascination. They do not respect the hierarchy, titles and regalia, and at the same time are distinguished by modesty and unpretentiousness.

The IT professionals do not tolerate constraints. They value perspectives and trends, individualism and independence, and evaluate the others based on their personal qualities.

The communication peculiarities of the representatives of the IT society are extremely specific. These people are cold, businesslike, reserved and unsociable. They prefer the written form of communication, considering it more reliable. Hereby, the exchange of information does not lose its quality, as it is dictated entirely by business needs and the filling of the gaps.

Emotional communication styles are not typical for the representatives of the studied community. These people have significant control over their emotions and do not allow external factors to affect their productivity and mood. They are private, restrained, moderate and consistent. They avoid interference in the other's affairs and react sharply to interference in their affairs.

The life strategy of the IT community is related to stability of ideals on one hand and flexibility of methods on the other. There is significant firmness in the views and values of the community, which is not contrary to the passion for creating and innovation, seeking unknown paths and new opportunities, as well as creating different structures and defining new laws.

Although the IT Guild's worldview is based on respect for science and established concepts, all existing paradigms are criticized in the search for new methods. IT professionals do not allow established methods and instructions to impede their creativity.

Forceful methods are inappropriate for managing IT teams. The teams must be convinced that what they are doing is right and above all, meets their intellectual standards. In order to follow a particular idea, they must be attached to it and feel involved in the process. Therefore, IT management should take into account the peculiarities of the psycho-informational profile of the IT departments and their differences with the TIMs of the others organizational units.

Having the psycho informational profile and composition of an integral system, we can deduce its properties and characteristics, as well as to predict its behavior, development and dynamics under certain conditions.

The integral approach in the study of the group informational metabolism allows, knowing the properties of a community, to identify the integral TIM. Differential approach allows, by examining the composition of the community, to derive its specific properties, key characteristics and attributes that determine the uniqueness of the community within whole society.

The illustrated methodology is applicable to studies of the behavioral characteristics of different communities, subcultures, social and minority groups, as well as various corporate units with integral informational metabolism.

REFERENCES

Augustinavichute A. (1995) Informational Metabolism Model, *Socionics, mentology and personality psychology*. K., №1

Augustinavichute A. (1996) Human Dualistic Nature, *Socionics, mentology and personality psychology*. K., №1–3

Augustinavichute A. (1997) Theory of Intertype Relations, *Socionics, mentology and personality psychology*. K., № 1-5

Augustinavichute A. (2003). Comment to Jungian Typology and Introduction to Informational Metabolism, *Psychology and Socionics of interpersonal relationship*, K., № 1, 26–33

Augustinavichute A. (2008) Socionics, M: Chernaya Belka, (Russian)

Bukalov A.V. (1998) Integrated Types of Collectives, Nations, States. Ethnosocionics. *Socionics, mentology and personality psychology*. K., №5, pp. 34-45.

Bukalov A.V. (2009) The Basic Principles of Integral Socionics. *Psychology and Socionics of interpersonal relationships*, K., №10, pp. 46-51.

Bukalov A.V. (2016) Ethnopsychology and ethnosocionics, *The origin of language and culture: the ancient history of humankind*, K., Vol. 3, № 1, 25–29

Ermak V. (2009) Classical Socionics. The system concept of the theory of informational metabolism of the psyche, M: Chernaya Belka (Russian)

Gulenko V. (1995) Management of harmonious team. Socionics and socioanalysis for managers, N: RIPEL. (Russian)

Gulenko V. (2009) Humanitarian Socionics, M: Chernaya Belka, (Russian)

Gulenko V., Molodsov A. (1991) Introduction to Socionics, K:VZUUP (Russian)

Jung K. (2005) Psychological Types, S: University Press "St. Kliment Ohridski" (Bulgarian)

Kenarov D. (2019) *Entrepreneurship*, Volume: VII, Issue: 1, pp. 75-83

Reinin G. (2010) Secrets of the type. Models. Groups. Signs. M: Chernaya Belka, (Russian)

Udalova E., (2007) Socionics in HR or What does the MBTI, M: Agentstvo Socion (Russian)

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WOMEN IN ADVERTISING

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Abstract

Advertising is a very important and powerful tool for companies to attract consumers. Companies spend huge sums of money to fight against the consumer's attention deficits. That is why they try to make their ads interesting, more attractive, appealing, sexier, exciting. However, at the same time, advertising is a reflection of existing social, economic, political, scientific, technological, cultural, and moral values of a society.

Over the past 100 years or so, research has shown that advertising has manipulated and distorted the real image of women. Companies do not portray women as powerful and inteligent persons, but on contrary, they were presented stereotypically as housewives or sexual objects and dependent on men. In almost all advertisements, the woman was presented as naive, unintelligent, weak, submissive and obidient creature.

In the 21st century, advertisements portray women in ideal proportions, with beautiful physical attributes, skinny, tall, blonde, brittle, delicate. They create another problem now, for ordinary women and girls who want to copy those models. Today ads impose problems such as depression, malnutrition, low self-esteem, underestimation, complexes, low self-value.

The main challenge is to make pressure on advertising companies to portray women in a more positive way, as a role model in a society. Women have to be shown in normal sizes, different colors and shapes, with different business careers, that promote health, care and self-esteem.

Keywords: *Women, advertising, consumers, stereotypes, attention deficit, social values*
JEL Codes: *O20*

1. Introduction

With rare exceptions, women throughout history have been systematically and continuously "removed" from civilization, historical events, and on the margins of active

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involvement in public, cultural, political life, and the arts. Because of her beauty and feminine eros, she was misunderstood and accused, always confronting to male power and the patriarchal cultural matrix. The advertising companies were not exception.

Clay (2017) says: "Advertising is a key part of popular culture and a reflection of social norms. The progress that has been made in our advertising of the portrayal of women mirrors how society has developed".

Advertising plays a major role in influencing and transmitting social values. The portrayal of women in advertising is an issue that has received a great deal of attention through the years. Advertisements reflect the stereotype that women do not do important things, are dependent on men, lack individuality are regarded by men primarily as sex objects, are preoccupied with beauty and motherhood and should be in home. (Gulati, 2014). Women were viewed as "things", objects of male sexual desire, and/or part of the merchandise rather than people (Hall, Crum, 1994). Body exposure and frequency of these ads have increased at an alarming rate over time. These chest, leg, buttock, and crotch shots increase the stereotypes and images that women are "bodies", rather than "somebodies" (with personalities) (Hall, Crum, 1994).

Over time, the role of women in advertising has changed. She becomes equal to the man, becomes independent, self-confident and a person who knows what she wants, and can make decisions on her own. But although her portrait has changed, the ads bring a new problem in modern times. In the ads, women are self-sufficient, happy and satisfied, portrayed in many professions (which in the past were considered male exclusively). The women in the ads are ideal, with beautiful proportions, with thick blond hair, beautiful eyes, slender bodies, slim, gentle, fragile. This ideal of a woman becomes a dream for every ordinary woman or girl. Unable to recognize that it is "an artificial beauty" (too much makeup, technically visual changes, corrections), ordinary women suffer from the inability to achieve that. Advertising creates new problems, such as depression, malnutrition, low self-esteem, and frustration.

Today, there are examples of companies trying to portray women not stereotypically, but in a new, positive and real light. Some magazines such as Vogue promised to be "ambassadors for a healthy image" (Cohen, 2012). That magazine's "Health Initiative" promised to not include models with eating disorders or under the age of 16 in the editorial pages of the 19 international editions of Vogue. However, study showed that the majority of women said they were willing to buy magazines featuring heavier models, but most believe that clothes look better on thin models (Garner, 1997)

Company Dove (Sutton, 2009), has different experience. Her brand manager Katie Adams noted: "The Campaign for Real Beauty has continued to challenge the narrow definition of beauty. Our research shows that women want to see more realistic representations of beauty in the media and advertising, so it is no wonder that the campaign has continued to resonate with millions of women worldwide."

2. History of women in advertising

It seems that the quote of Shirley Chisholm that "The emotional, sexual, and psychological stereotyping of females begins when the doctor says, "It's a girl!." is true. Men and women differ in many ways, so it should not be surprising that advertisements portray men and women differently.

However, from todays's perspective the advertising in the early 1900s can be seen as sexist, offensive and racist towards women. On one side, women were shown as weaker and more submissive sex than men and they exist to please men. Many tobacco companies would use women in their ads to sell products, and the women would be totally nude. (DiSalvatore, 2010). On the other side, women are portrayed as obedient housewives, that are happy to be glued to the kitchen, doing home chores, as cooking, cleaning, washing, caring for her husband and children. Advertisements placed women in their home. One of the most enduring female characters in advertising at the time was Aunt Jemima, who invited families around the world to pancakes and homemade food. Aunt Jemima eventually became an icon. (Ad Age Encyclopedia, 2003). Through the 1930s, advertisements continued to portray women primarily as homemakers or objects of sexual desire.

The Great Depression and World War II have left deep scars on society, and military propaganda seeked to expand the role of women in advertising. There was conflict between women's actual role in society and the previous ways in which advertisers portrayed them. Women now are important for family, but for state too! Men are gone to the battlefield and there were women left to care for the home, family, society! Advertisements with women workers in factories and housewives prevailed. Many advertisers portrayed women in their newly expanded roles. For instance, Eureka showed three women in its vacuum cleaner ads—one in a military uniform, one in pants and another in typical housewifely garb. (Ad Age Encyclopedia, 2003).

However, in the post-war period, the woman again returns at home (to her chores!) and waits for her husband to come back from the battlefield. Advertising marketers once again are showing women at home, and some even suggest that the working woman is not a good mother!

In the 1950s, advertising was most sexist. The woman is tied to her home, and in the advertisements she is submissive to the endless will of the man. In addition to submission in advertisements, her naivety, stupidity, obedience, and ignorance are pointed out. This era in advertising is called an era of "Mad Men" when the ads implied that women were idiots who cared mostly about pleasing their men. (Harrison & Edwards, 2014). Some of the most egregios and sexist ads from that time were:

1950: The ad begins, "Most husbands, nowadays, have stopped beating their wives ... " (Heinz company),

1951: "Show her it's a man's world." (Van Heusen ties),

1952: Ad that promotes domestic violence and beating wife. (Chase & Sanborn Coffee),

1952: "Don't worry darling, you didn't burn the beer!" (Schlitz),

1953: Alcoa Aluminum's bottle caps open "without a knife blade, a bottle opener, or even a husband." (Alcoa Aluminum)

1953: It's so easy to use that even a woman with "no mechanical aptitude" can operate it. Is it always illegal to kill a woman? (Palmolive)

1956: "Budweiser has delighted more husbands than any other brew ever known." She married two men! (Budweiser)

1961: "The Chef does everything, but cook - that's what wives are for!" (Kenwood)

1963: The most important quality in coffee is how much it will please your man. (Acme Coffee)

1964: "Are you woman enough to buy a man's mustard?" (Mr. Mustard)

In some advertisements, the woman is portrayed as a worker, but in the role of secretary, telephone operator, clerk who uses office equipment and furniture. However, she is presented as a worker and a follower, not as a boss or leader.

In the 1960s and 1970s, during the period of the Sexual revolution, feminist movements and women's rights movements, the portrayal of women in advertising changed dramatically. The National Women's Organization, founded in 1966, seeks to remove the stereotypical portrayal of women in advertisements. The ads focus on independent and free women who, although married, have their own car, job, career, and participate in decision-making. One of the turning points in advertising's portrayal of women came with a landmark campaign from Revlon in 1973. The Charlie perfume campaign featured confident young women in tailored pantsuits pursuing traditionally male-oriented activities. (Ad Age Encyclopedia, 2003).

In commercials from the 1980s, the woman portrayed herself as a careerist and a "super-mother" by integrating her traditional and contemporary roles. She is sexy, but at the same time capable, independent, emancipated.

The 1990s brought dramatic changes in the display of women in advertising. The so-called "reversible sexism" was promoted, where men have a subordinate role in society and advertising. “Released”, free, open-minded and intelligent women do not need men. Research showed that during this period there was a strong correlation between the models in the ads that were extremely weak and fragile and the eating dissorders of young ordinary women and girls. Psychologists, nutritionists and activists pointed to the growing number of women suffering from bulimia and anorexia, due to the advertising.

By the turn of the 21st century, many key positions in advertising were occupied by women, enabling them to exert a major influence on ad campaigns. Some critics of the portrayal of women in advertising hoped this situation would give rise to more positive images of women.

3. Women in todays'advertising

Men and women today lead highly complex lives with multiple societal roles. Men and women are parents, businesspeople, corporate board members, friends, siblings, volunteers, and more.

Today, in advertising, women are accepted in all roles, in all shapes, sizes and colors. She can be young and old, thin and curved, look sporty or leisurely, be intelligent, be a mother or a wife.

However, the problem of objectification, sexism and misogyny in advertising remains in the world. Although in hidden forms, the advertisements still show these prejudices about women and girls. For example, we can see women in ads for beauty products, clothes and shoes, but not for promoting new technology or innovation. These types of ads are typically only seen in male magazines. (DiSalvatore, 2010)

Girls, also still try to emulate the images of women in ads whether it is their hair, makeup, clothes, or even weight. These images lead to constant low self -esteem, eating disorders, and frustration. (Nigham and Jha 2007).

Under the pressure of women's movements, but also the public as a whole, a more positive portrayal of women in advertisements can be expected.

However, it must be borne in mind that the values that seem liberal and free-minded today may be problematic for future generations.

4. Women in Macedonian advertisements

In the Republic of Macedonia, according to the Annual Report of the Agency for Audio-Visual Media Services from 2016, in terms of advertising, the following can be concluded:

1) There is relative equality in the presence of men and women in advertisements, as the main characters, with the simultaneous noticeable presence of girls and boys in them (as independent carriers of the content or as a complement to the family atmosphere).

2) In advertisements, the most common age group are women aged 31-45, followed by those aged 18-30. Men are also usually 31-45 years old, followed by those in the age group of 46 years. This is due to the assumption that women / men at that age are potentially the biggest consumers of products and services.

3) Women often advertise products for women, but also other categories of products and services.

Women, regardless of whether they are the main or secondary subjects in the advertisements, in most cases are the bearers of traditional roles: housewives, wives and mothers.

In some advertisements they have neutral roles, and in some advertisements they

are presented as decoration. There are advertisements in which they attract attention with their physical appearance and are seductive.

The traditional representation of women is most often in the ads of food products, household appliansces, cleaning set, as well as in products/toys for children. However, the Agency for Audiovisual Media Services noted the spread of misogyny and sexism on the programs of several radio stations.

4. Conclusions

The main objective of this paper was to examine female roles portrayed by advertising. More specifically, it was important to understand what messages about women have been given to society through advertising and whether these portrayals have been changed during the past decades.

The messages that advertising have given to society are that women are not considered equally to men. In addition, there are many stereotypes against women and their images are used in to give pleasure to men. Furthermore, prejudices which have roots in the patriarchal regime are still impregnated in social relations. Additionally, women still occupy positions that are inferior to men.

However, female portrayals have changed over the years. Today's greatest challenge is trying to get advertising companies to change their ways of promoting stereotypes. Research has shown that realistic portrayals can have positive results for advertisers and that certain types of imagery, including objectification of women, cause negative responses from consumers.

At the end, let's use the wise words of Nike advertisement of 1990s: "A woman is often measured by the things she cannot control. She is measured by the way her body curves or doesn't curve. By where she is flat or straight or round. She is measured by 36-24-36 and inches and ages and numbers. By all the outside things that don't ever add up to who she is on the inside. And so if a woman is to be measured, let her be measured by the things she can control, by who she is and who she is trying to become because as every woman knows, measurements are only statistics, and statistics lie."

REFERENCES

Anthony Cortese, "Provocateur – Images of Women and Minorities in Advertising", 3rd Edition, Rowman and Littlefield Publishers, New York, 2008

Академик "Како се прикажуваат жените во рекламите – Годишен извештај за имплементација на Стратегијата за родова еднаквост", Академик, 10 ноември, 2017 година, https://www.akademik.mk/kako-se-prikazhuvaat-zhenite-vo-reklamite-godishen-izveshtaj-za-implementatsija-na-strategijata-za-rodova-ednakvost//,

Ad Age Encyclopedia; "Women: Representations in Advertising", Ad Age Encyclopedia, September 2003, https://adage.com/article/adage-encyclopedia/women-representations-advertising/98938/

Clay Lindsey (2017), "0 from 50: Changing trends of female representation in TV commercials ", https://www.campaignlive.co.uk/article/six-stereotypes-women-advertising/1426391

Cohen Tamara (2012), "Fashion Bible Vogue to ban underweight and underage models", Mail Online, https://www.dailymail.co.uk/femail/article-2139471/Vogue-vows-ban-underweight-underage-models.html

Garner David (1997), "Body image in America: Survey results", https://www.psychologytoday.com/us/articles/199702/body-image-in-america-survey-results

Disalvatore Ellen "Portrayal of Women in Advertising", New York, 2010

Gulati Monika (2014), "Analysis of Projection of Women in Advertisements on

Society" Motilal Nehru College, Delhi University, Global Journal of Commerce and Management perspective, ISSN 2319-7285

Hall, C. & Crum, M. J. (1994). "Women and "Body-isms" in television beer commercials". Sexroles,https://pdfs.semanticscholar.org/37b3/442f6f294b6a50eff6dd2a01dbbccef49680.pdf

Nigham, and Jha. (2007), "Women in Advertising: Changing Perception. India", The Icfai University Press

Patterson Maurice, Story Vicky, Lisa O'Malley, "Women in Advertising: Representations, Repercussions and Responses", Research Gate, January, 2009

Pachev Plamen, (2014), "Hedonic Consumption-Nature and Research-Approaches", Enterpreunership, Issue 1 and 2, 2014, http://ep.swu.bg/index.php/archive/2014/2014-issue-1/23-hedonic-consumption-nature-and-research-approaches

Jacobs Harrison & Jim Edwards (2014), "26 sexist ads of the Mad Men era that companies wish we would forget", Business Insider, https://www.businessinsider.com/26-sexist-ads-of-the-mad-men-era-2014-5

Silverstein Maddie, "WHM: Women's Past, Present and Future in Advertising", March, 2018

Sivulka Juliann, "Ad Women: How they impact what we need, want and buy", New York, Prometheus Books, 2009

Sutton, D. (2009). Globalizing ideal beauty: How female copywriters of the J. Walter Thompson Advertising Agency redefined beauty for the twentieth century. New York, NY: MacMillan Palgrave.

Zlateva Dinka (2005), "The Interactivity as the main factor, forming the Internet consumer behavior, the Role of the Internet motives in the interactive advertising model", Economics and Management, volume 2, 2005, http://em.swu.bg/index.php?option=com_content&view=article&id=358:thelinteractivity-as-the-main-factor-forming-the-internet-consumer-behavior-the-role-of-the-internet-motives-in-the-interactive-advertising-model&catid=26:2005&Itemid=116

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DIGITAL TRANSFORMATION OF MARKETING COMMUNICATIONS

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Abstract

The digital transformation has led to radical changes in marketing communications. The traditional business model no longer covers all the needs of the modern consumer. That is why the transformation is mandatory for every company that wants to be competitive in the market. The Internet and digital media have opened up new opportunities for marketers who have adapted the tools they use to new consumer habits. Today, marketing communications more than ever require an integrated approach to reach a target audience, encompassing both traditional channels and the online opportunities offered by new technologies.

Keywords: *digital marketing, evolution of web technologies, digital marketing tools, digital marketing communications*
JEL Codes: *M30, M31, M37*

Introduction

Modern business is increasingly investing resources and efforts in the digital environment. New forms of business are emerging, the number of communication tools is growing, and all this is a result of the integration of the information and communication industry. The new generation of users has new information habits. The Internet is part of the daily life of people who actively search, communicate, and share in an online environment regularly. Today, the user is not only a "consumer" of content but also a publisher of such. That is why companies need to adapt their strategies to the benefits that the online environment provides. There are a considerable number of online-based solutions and tools for communication with new users, which offers an opportunity for the development of e-business. Understanding technology-based marketing is critical to today's business as it leads new customers, creates new brands, opens new markets, forms new market leaders and reveals the potential for creativity in digital marketing (Tiago, MT, and Tiago, F., 2012, pp. 418–426) The Internet is a world of fast and creative entrepreneurs and it is not a static world. The changes quickly catch up with the status quo

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and radically transform the business landscape into an online environment. Therefore, systematic research and a deeper understanding of the phenomenon of digital marketing are needed, as well as to know the opportunities provided by the online environment to achieve competitive advantages.

Analysis and discussion

Transition of marketing from 1.0 to 4.0

The Internet market is relatively young, but it is developing at high speed, providing many opportunities for businesses to communicate with the market. According to Swati Bhatt, currently, we are in the throes of another shock to the system, a technological shock in the form of digital connectivity, creating a network of economic agents, a network economy. (Bhatt, 2017, p.16) Digital marketing has undergone rapid and radical changes from its inception to the present day.

The Web is the most significant transformative information construct. Introduced in 1989 by Tim Berners-Lee, the network has undergone a major transformation over the last three decades, including related technologies (Brian, Getting, 2007). 1.0 was known as a network of knowledge, Web 2.0 as a network of communication, Web 3.0 - a network of cooperation and Web 4.0, which we gradually entered much earlier than expected - a network of integration. These four generations of the network describe its path to the state in which we know it today.

Web 1.0 is the first generation of the network, which was intended for reading only and was accepted as a system of knowledge. Web 1.0 was introduced as a business information point to inform people. At this initial stage, the network provided limited opportunities for information transfer and interaction with users.

Web 2.0 is making great progress in online relationships. Dale Dougherty defines the web as a network for reading and writing. (Berners-Lee, T., 1998) Web 2.0 technology allows the management of large communities with common interests in social interactions.

Web 3.0, also known as the Semantic Network, aims to reduce human tasks and solutions and leave them to machines by providing machine-readable content on the network. (Hamed, H. & MohammadReza, K., 2011) Web 3.0 includes two leading platforms: semantic technologies and a computer-based social environment. Semantic technologies are open standards that can be applied in the network. The computer-based social environment allows cooperation between man and machine and provides an opportunity to organize a large number of social web communities. (Ossi, Nykänen, 2003)

Web 4.0 was a revolutionary step in the development of technology. This generation is also known as the symbiotic network, in which the human mind and machines interact in symbiosis. Web 4.0 is not associated with the fourth industrial revolution. It is characterized by a much more ubiquitous and mobile internet, by smaller and more powerful sensors that

have become cheaper, and by artificial intelligence and machine learning. (Dimitrieska, Stankovska, and Efremova, 2018, p.183)

It should be noted that marketing is also evolving at different stages. If in version 1.0, marketing was product-driven or product-centric marketing to customer-centric marketing at 2.0, then in Marketing 3.0, the focus shifts to the human. (Kotler, Ph., Kartajaya, H., Setiawan, I., 2017, p.11) Kotler points out that at this stage, the future of marketing lies in the creation of products, services, and corporate culture that embraces and reflects human values. The Internet is part of the human experience. Digital technologies allow for new adaptive processes and institutions in marketing communication. Institutions build foundational capabilities to create such value jointly for their customers and themselves, while processes create value through unique customer experiences and interactions among customers in new digital environments. (Kim, J., Kang, S. and Lee, K.H., 2019)

The first stage of internet marketing, as well as the first marketing tool in the online environment, was e-mail. Later, companies began to create websites and generate traffic from users to their web-based resources. In 2000, with the advent of search engines (Google and Yahoo) came the era of banners, which ended with the introduction of the option for the user to disable intrusive ads. This gave rise to a new way of thinking in an online environment and the introduction of so-called Permission marketing. (Godin, S., 1999) Technological stage 2.0 determined the transformation of the Internet market into a global society, in which special attention is paid to marketing relationships aimed at establishing contact with the customer, promoting and maintaining their loyalty. However, this did not solve the problem with annoying marketing tools. Many authors define the period between 2000 and 2004 as a transition from mass marketing to personalized marketing. Other authors classify social networks as setting them as second-generation network applications that allow the creation of separate virtual networks as part of the 2.0 technology. Today, the field of social networking is becoming one of the fastest-growing markets in the Internet environment, connecting hundreds of millions of users worldwide. The potential of the Internet market is growing new means of communication are emerging, which change the nature of the market, moving from 3.0 to 4.0 technologies. It should be noted that the Internet and its breakthrough in people's lives has a huge impact on business and specifically on payment platforms, communications, promotes the development of the online market, where the effectiveness of activities can be measured by the success of marketing tools and Internet penetration.

The technologies we are witnessing today are not new, but they are already bringing together, and this convergence is influencing the development of marketing practices. Thanks to the integration, new trends are emerging today: the sharing economy, the new economy, multi-channel integration, content marketing, social CRM (Consumer Relations Management), and more. (Godin, S., 1999, p.12)

In parallel with technological development and marketing changes, the specifics of communication must be analyzed. The classification of marketing communication reveals the main problems that should be considered during the research for online business:

- *Communication channels* that can be used for information exchange between seller and buyer for receiving, processing and transmitting information; increase interactivity and experience, collect information about customers through various online platforms, conduct research and introduces new products to the market, improve customer relationships and, thanks to personalization in relationships, adapt products to specific consumer expectations;

- *Transaction channels* that can be used in sales to improve visibility and reach a wider audience, increase revenue through cross-selling, simplify the transaction process by reducing the complexity of tasks, document processing and the cost of transactions, proper targeting of the audience and targeting specific advertising messages to relevant users;

- *Distribution channels* that can be used for the physical exchange of goods and services to avoid storage costs, as well as shortening the distribution chain and reducing end-user costs;

Advantages of digital media

Interaction and integration between the Internet and traditional channels is a key part of developing a digital marketing strategy. The digital marketing strategy is essentially a marketing strategy for online channels and should be integrated with other channels as part of multi-channel marketing. According to Chaffey and Ellis-Chadwick, an effective digital marketing strategy must meet some conditions such as: (Chaffey, D, Ellis-Chadwick, F., 2012, p. 16)

- adapting the marketing strategy to the business, to be subordinated to the corporate strategy of the company;

- To define clear goals for the development and the brand, having a clear vision for the contribution of potential customers in total sales;

- To maximize the communication and proposals to customers that the company can reach effectively in the channel;

- To correctly determine the relationship between online and offline communication tools used to attract visitors to the company's website or interaction with the brand through other digital media, such as e-mail or mobile devices;

- To support the customer's journey in the purchase process, as he chooses and buys products using the digital channel in combination with other channels;

- managing the readiness of customers to purchase during the stages of generating user traffic to the site, turning them into customers and retaining them.

Digital marketing is a management process responsible for identifying, guiding the user along the path, and meeting their requirements. The focus is on the customer, while at the same time suggesting the need to connect with other business operations to achieve profitability that satisfies both parties in the process.

According to Chaffiy and Smith, digital marketing supports these goals as follows: (Chaffey, D. and Smith, P.R., 2012)

- Identification - through marketing research to identify customer needs;

- Navigation - the online environment provides an additional channel through which customers have access to information and make purchases;

- Satisfaction - this is the main factor for success in digital marketing; it makes it possible to determine whether the site is easy to use, whether it works adequately, what standard of service it uses, and how the goods are physically delivered to the end-user.

Digital marketing is a powerful tool to help achieve the company's corporate goals. It contributes to the successful implementation of the Ansoff Matrix (also known as the Product / Market Matrix), broken down through the company's objectives: market penetration, market development, product development, and diversification.

Digital marketing tools

The Internet offers marketers a wide range of advertising tools and formats, the use of which depends on the specifics of the target audience, its patterns of behavior, cultural aspects, habits, and more. Making and implementing marketing decisions in an online environment requires knowledge and technical experience in presenting details to customers. Digital advertising is the most direct way to reach customers. It can be classified as: search engine advertising, display advertising, classified lists, and email ads.

According to Jensen, there is no established categorization of online advertising so that it can be considered in six main areas: (Jensen, N.B., 2008, pp. 502-525)

- ***Search Engine Marketing***: Search Engine Advertising (SEA) and Search Engine Optimization (SEO). Search engine marketing is a comprehensive term for all the techniques that can be used to make a particular website visible to search engines. The search results page is divided into organic results, which depend on the relevance of the web page to the keywords entered by the user (SEO) and paid results, which also appear as search results. However, research shows that consumers are negative about paid advertising.

- ***Online public relations*** - these are presentations on portals, blogs, RSS, podcasts, social media, user posts in communities - C2C, micro-blogs, and more. Online PR includes all activities performed by the company to increase the favorable attitude of consumers to the company, brand, or their positive mention in other web-based resources - e.g. blogs, social networks, etc., where the target users of the company are likely to enter. Social networks are a very powerful tool for creating PR communication with the audience. In order to build community and engagement through them, consistent communication is needed (one or two publications from the company per day). Companies need to consider the day, time, and content of their posts, as engagement rates are 18 points higher on Thursday and Friday than on other days of the week. A shorter message is better because posts with 80 characters or less have a 27% higher engagement rate. (eMarketer, 2011) According to a study by eMarketer, social media is a place for contact and "discussion" with brands, but social sites are not yet the

first choice of customers who talk about brands. Only 35% of consumers and 56% of young people talk about products and services on social sites.

- ***Interactive advertising***: includes display advertising, banners; rich media; websites, microsites; online games; video marketing, etc. The first three of these are display ads that aim to raise brand awareness and encourage clicks on the target website. It has been found that even without clicks, advertising banners lead to increased awareness, perception of the brand, and the formation of attitudes towards brands. The significance of the animation and the location of the banner ad is discovered based on studies with eye-tracking technology. Surprisingly, it has been found that animation is not essential for attracting the viewer's attention. On the other hand, location plays an important role. Banner ads placed at the top of the web page are more commonly viewed. A 2006 study by Burns and Lutz on consumers' attitudes toward six different ad formats (banners, floating ads, large rectangles, banners, skyscrapers, and pop-ups) showed the following result: banners are most effective because they have the highest information value for consumers. The study found that banners had the best user acceptance, both in terms of clickthrough rate and the highest clickthrough rate. (Burns, K & Lutz, R.J, 2006, pp. 53-63)

Pop-up and pop-under ads are the most controversial format of online advertising. Interstitial ads are considered intrusive because they put the user in forced viewing mode. Surveys show negative attitudes and reactions from consumers, who remain irritated. Rich media is a user-friendly format. Research shows that they are acceptable to users because they guarantee a better evaluation of the site compared to those with only text and graphics. New technologies improve the effectiveness of online advertising. Studies confirm that animated ads are more effective than banner ads. Consumers point to video advertising as the most exciting format, as it has a high degree of engagement. The introduction of game mechanics also has a strong effect on companies in online positioning, but players often feel annoyed by the ads that are part of their online experience.

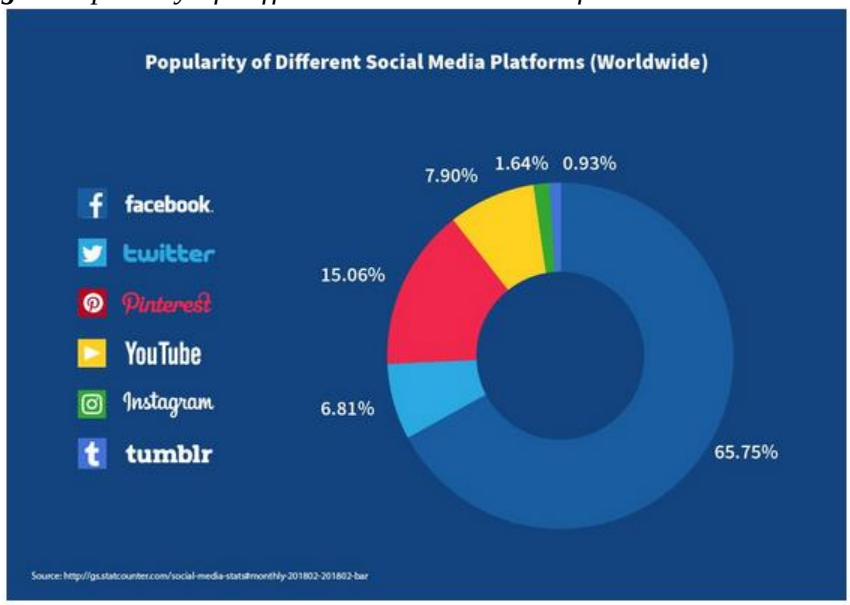
- ***Online partnerships*** or these are building relationships, sponsorships, affiliate marketing and more. The most commonly used tools for online partnerships are: link building, sponsorship, joint branding (agreement between several companies that agree to show each other content and conduct joint promotions using logos or brand advertisements), affiliate marketing (a scheme where the company pays another affiliate for links that are generated through the affiliate's website to the company's website); Studies examining the effects of online sponsorship show significant benefits for sponsors of content websites (such as news sites or e-newspapers). If the products that are advertised correspond to the content of the news, they cause a stronger memorability of the brand, form intentions and attitudes for purchase. The attitude towards advertising is positive when it appears at the beginning of the news story, it reflects the highest if it is in the middle, and the lowest at the end of the show.

- ***Opt-in emails*** - a list of emails whose users have once agreed to receive company newsletters or promotional letters. Email advertising is a cheap form of communication, but it is the least effective. According to eMarketer research, only 1% of users read the entire email

ad, 20% occasionally read personalized emails. After the introduction of the GDPR, new requirements were imposed on companies in the implementation of email marketing and for this purpose it is necessary to apply the so-called. Double Opt-In - this is a double confirmation of the user who voluntarily agrees to receive newsletters and advertising emails from the company.

- ***Viral marketing*** - it's an advertising method that encourages people to send a message. The terms buzz marketing and word of mouth are used interchangeably for viral marketing. That is an appropriate and efficient way to spread the message to a wide audience. One of the most influential forms of viral marketing is social media marketing. It is believed that marketing in social networks can be oriented to the framework for the development of value and turn it into a social and societal process. Users use social networks mostly to share information with friends and to explore friends. This type of marketing is a customer-oriented approach to generating value. Viral marketing in social networks is carried out through the ability to share, comment, and like posts. The so-called influencers or a type of opinion leaders who have their followers and are an example for many users on the network also play a substantial role. (Fig. 1)

Fig. 1 *Popularity of Different Social Media Platforms*



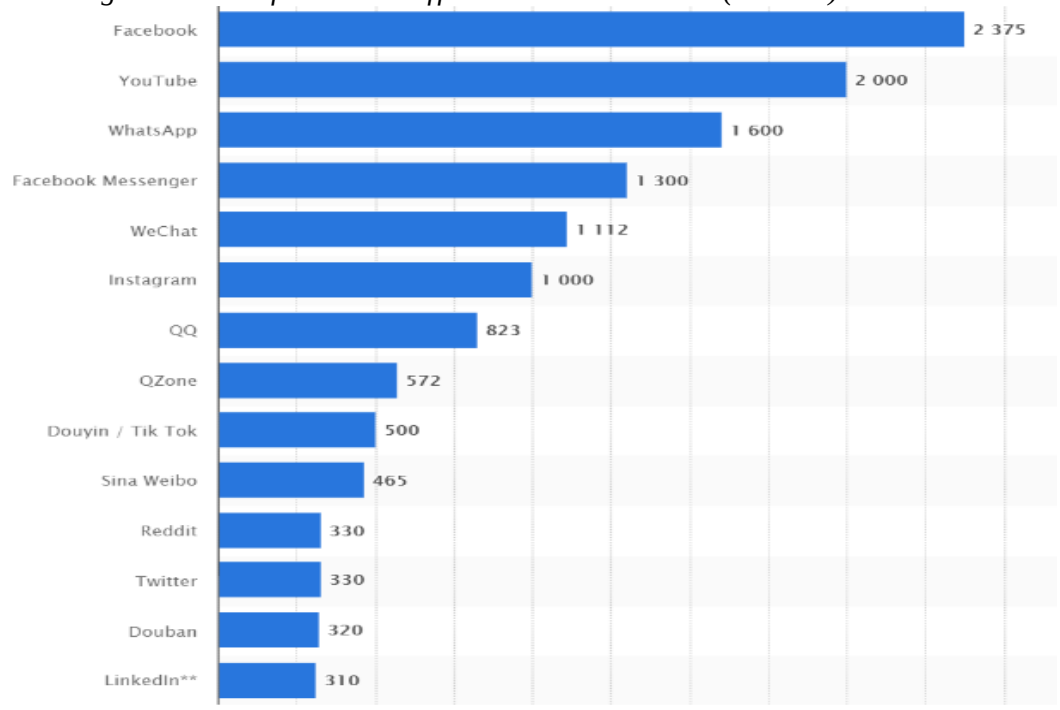
Source: *23 amazing statistics on the Internet and social networks in 2020, Available at: https://www.digitalfuturetimes.com/23-amazing-statistics-on-internet-and-social-media-in-2019/*

Statistics show that currently, there are over 2.77 billion social network users worldwide or 64% of all Internet users. (INC.bf) According to Statista.com, social networks are the most popular platform in which users spend their time keeping in touch with friends, family, or getting information. More than half of the users are from North America, with more than 160 million in the United States alone (Statista.com). Some social networks have a more active user mass than others. (Fig. 2) It should be noted that if at its inception the network attracted mainly young people, in the last ten years interest in it has been observed by older age groups. Marketers use these segments with the application of Social Media Marketing.

Twitter has over 336 million registered users and nearly 190 million unique visitors per month, of whom 135 million active users tweeted nearly 58 million times a day. 43% use the mobile version, and 60% tweet/share content through sites, which shows that users do not participate in this process alone. 40% of users do not write tweets themselves, but read content shared by others. (INC.bg)

LinkedIn includes more than 110 million professionals worldwide, including all Fortune 500 companies. This platform has a low impact on the market because its users are less active than the above networks.

Fig.2 Number of users on different social networks (millions)



Source: *Influencer Marketing Hub, Social Media Trends 2020, https://influencermarketinghub.com/SmallereBook2_trends_2020.pdf*

The most significant benefits of implementing marketing in social networks can be expressed in the following directions:

- Consumer trust is higher - it is ensured through the use of social contacts, direct communication between consumers who share and recommend the use of a product. The ability of companies to have immediate feedback from customers is a substantial factor in preference to using social networks as a marketing tool. Social networks have access to two very important sources of information for users: their profile with personal information shared by the user, his behavior on the web, pages visited, interests, social circle, and more.

- Social networks can use the behavioral guidance, interests, and activities of other members of the web related to the user, their reactions to various marketing actions. Due to a large amount of information for participants, targeting can be extremely precise.

From all that has been said so far, we can say that today marketers work in a highly dynamic and uncertain environment. They face the challenges of the new age. The Internet has opened many opportunities for proper targeting, for appropriate directing of marketing efforts in the direction, for reaching the messages to potential customers, providing conditions for building a company image, forming attitudes and intentions in consumers. Forms of end-user access will continue to diversify, and the battle to gain market position will increasingly drive companies' interest in the online environment. That is the future, and the only way to survive is to adapt to change.

Conclusion

Digital transformation is happening all around us. It provides the conditions for a more efficient process of creating economic value. The digital transformation is sustainable and has a revolutionary impact not only on economic systems but increasingly on the lives of people and society as a whole. Every day the world around us changes. New companies are emerging that work in a new and different way. The impact of digitalization has not gone unnoticed by marketing processes. Today, digital marketing provides many benefits to real business. The use of the Internet, social media, mobile applications, and other digital communication technologies have become part of the daily lives of billions of people. The influence of digital media on consumer behavior is an increasingly exciting field for research. We live in the age of digital transformation and the world of Marketing 4.0. Today, digital communications are increasingly deepening on human-centered marketing, encompassing every aspect of its path along the consumer path. Convergence and unification of industries is the new trend, and this will be a lasting direction in the development of business processes. We live in interesting times, in which

what is valid today is old and inapplicable tomorrow. And what does the future hold for us? These can only be conjectures.

REFERENCES

23 amazing statistics on the Internet and social networks in 2019, Available at: https://www.digitalfuturetimes.com/23-amazing-statistics-on-internet-and-social-media-in-2019/

Berners-Lee, T. (1998), The World Wide Web: A very short personal history, Available at: http://www.w3.org/People/Berners-Lee/ShortHistory.html, [Accessed November 20th, 2019]

Bhatt, S. (2017), How digital communication technology shapes markets. Redefiniting, Competition. Building. Cooperation, Palgrave Advances in the Economics of Innovation and Technology, Springer Nature, Springer International Publishing AG, doi: 10.1007/978-3-319-47250-8

Brian, Getting, (2007) "Basic Definitions: Web 1.0, Web 2.0, Web 3.0", Available at: http://www.practicalecommerce.com/articles/464-Basic-Definitions-Web-1-0-Web-2-0-Web-3-0 [Accessed November 23th, 2019]

Burns, K& Lutz, R.J (2006), The function of format: consumer responses to six online advertising formats, Journal of Advertising, Vol. 35 No 1, pp.53-63

Chaffey, D. (2012) 'Social Syndication Tools. Digital marketing strategy'. Available at: http:// www.smartinsights.com/blog/digital-marketing-strategy/tools-tracking-social-syndication [Accessed March 9th, 2019]

Chaffey, D. and Smith, P.R. (2012) *Emarketing Excellence, Planning and optimising your digital marketing*, 4th edn, Taylor & Francis

Dimitrieska, S., Stankovska, A., Efremova, T., (2018), Journal of Economics and Management, vol.15, issue 2, 2018, ISSN:2367-7600; 1312-594X, Available at: http://em.swu.bg/images/SpisanieIkonomikaupload/Spisanieikonomika2018/THE%20FOURTH%20INDUSTRIAL%20REVOLUTION-ADVANTAGES%20AND.pdf [Accessed February 10th 2018]

eMarketer, (2011), Social Media Outlook for 2011, Available at: https://www.slideshare.net/eMarketerInc/emarketer-webinar-social-media-outlook-for-2011 [Accessed November 30th, 2019]

Godin, S, (1999), Permission Marketing: Turning Strangers Into Friends And Friends Into Customers, Simon & Schuster Publisher

Hamed, H. & Mohammad Reza, K. (2011), A MACHINE LEARNING BASED ANALYTICAL FRAMEWORK FOR SEMANTIC ANNOTATION REQUIREMENTS, International Journal of Web & Semantic Technology Vol.2, No.2

Inc.bg, Intrnet Statistic and Facts 2019, Available at: https://www.icn.bg/bg/blog/polezno/internet-stats-facts-2019/ [Accessed February 20th, 2019]

Influencer Marketing Hub, Social Media Trends 2020, Available at: https://influencermarketinghub.com/SmallereBook2_trends_2020.pdf [Accessed February 20th, 2020]

Jensen, N.B. (2008) 'Online marketing communication potential: priorities in Danish firms and advertising agencies', European Journal of Marketing, 42(3/4), pp. 502–525

Kim,J., Kang, S. and Lee, K.H. (2019), Evolution of digital marketing communication: Bibliometric analysis and network visualization from key articles Journal of Business Research, https://doi.org/10.1016/j.jbusres.2019.09.043

Kotler, Ph., Kartajaya, H., Setiawan, I. (2017) Marketing 4.0 – Moving from Traditional to Digital, JohnWiley&Sons,Inc.,Hoboken,NewJersey, p. 11

Ossi, Nykänen (2003), Semantic Web: Definition", http://www.w3c.tut.fi/talks/2003/0331umedia-on/slide6-0.html

Spivack, N. (2011), "Web 3.0: The Third Generation Web is Coming", Available at: http://lifeboat.com/ex/web.3.0 [Accessed November 20th, 2019]

Statista.com, Statistics and Market Data on Social Media & User-Generated Content, Available at: https://www.statista.com/markets/424/topic/540/social-media-user-generated-content/

Tiago, M.T. and Tiago, F. (2012) 'Revisiting the Impact of Integrated Internet Marketing on Firms' Online Performance: European Evidences', Procedia Technology, Vol 5, pp. 418–426.

REVIEW FOR COLLECTIVE MONOGRAPH «INSTITUTIONAL BASIS OF NATIONAL SECURITY PROVIDING SECTORS INNOVATION DEVELOPMENT» (ed. by Dr. of Economics, Prof. Prokopenko Olha, PhD in Economics Omelyanenko Vitaliy)

In modern conditions innovation development is critical for both business and society as a whole. At the same time, there is a necessity to improve the efficiency of state initiatives in sphere of support and development of innovations and the formation of an institutional basis for systemic innovation policy. We can confidently state that in the development of these initiatives, insufficient attention should been paid to researching the dynamic properties of innovation systems and analyzing their management capabilities.

Monograph is devoted to the research of theoretical and practical aspects of the innovation security and its institutional basis. Different innovative methodic approaches and economic mechanisms to provide innovation security at the regional, national and international levels are considered. Scientifically grounded recommendations to achieve economic, financial, social and ecological aims of the national security through the national security providing sectors innovation development are given.

As a methodological base for these purposes authors consider the system theory, especially the system sustainable development theory, which is focused on the searching for opportunities to reorient the system to development path that promotes a constant growing rate of growth of opportunities to meet the needs of society. Sustainability is the main and only criterion for system development, ensuring its integrity and further development.

The stability of the socio-economic system is associated by authors with the ability of the system to function steadily, to develop, to maintain movement along the planned trajectory with self-development. So the chapters provide interesting reading due to the original approach and rich contents.

The evidence from these studies suggests a variety of factors related to policy issues. This paper provides a new viewpoint on the institutional basis of national security providing sectors innovation development based on the new technology institutionalism ideas.

The topic of the research is interesting, sustaining the idea that the nation`s ability to defend itself and develop is correlated with the innovations availability.

An empirical research conducted among different stakeholders (experts, public authorities, public decision makers) or even specifying different opinions of experts on this issue strengthens the quality of paper.

Based on these ideas, we clearly see the role of the innovation system in sustainability ensuring. At the same time, innovation factor and its system nature should

be considered both as a factor of ensuring the sustainability of development, and as a factor of economic shocks, that can displace the development trajectory.

The paper is worked based on a good literature review. A good theoretical analysis is given. I can highlight the original contribution of the paper to the scientific literature of the field. So the presented collective monograph «Institutional basis of national security providing sectors innovation development» is a well-written, informative review. Based on foregoing I can recommend it for publication. A few of the references are given to the long out dated publications. The absence of theoretical treatment is disappointing, apparently practical, matters are of more interest for the author. Such mistakes and omissions are, however, incidental and in no way prevent the book being a most stimulating and useful.

To draw the conclusion, one can say that the presented collective monograph «Institutional basis of national security providing sectors innovation development» can be recommended for publication. Any attempt to continue the investigation is to be warmly welcomed.

Reviewer

Milena Filipova, PhD (Econ), Head of Management and Marketing Department, Southwest University «N. Rilski» (Bulgaria)

Institutional Basis of National Security Providing Sectors Innovation Development: monograph / edited by Dr. of Economics, Prof. O. Prokopenko, PhD in Economics V. Omelyanenko. – Agenda Publishing House, Coventry, United Kingdom, 2018. – 263 p.

REVIEW ON STUDY "DEPENDENCIES BETWEEN GOVERNMENT DEBTS AND INVESTMENT ACTIVITY, PARALLEL ANALYSIS OF PROCESSES IN BULGARIA AND GREECE“ (ed. by Assoc. Prof. Elena Stavrova, PhD in Economics)

The economic knowledge is complemented by a new edition that deserves all the attention of researchers, teachers and students and everyone is interested of the problems of economics and finance. In the study published in Volume 26/2018 of the “Scientific Research” Almanac by Assoc. Prof. Dr. Stefan Simeonov, PhD, Silvia Zarkova and Anelia Peneva, PhD-student, from the Department of Finance and Credit at the Academy of Economics “D. A. Tsenov ”, Svishtov, a complex of problems is considered, to which many books, articles and researches of scientists of several generations in the national and world economic literature are devoted. The authors propose their own carefully substantiated interpretation of the fundamental theoretical principles such as the relationship between the dynamics of regulated financial markets and government debt commitments.

The study aims to realize the author’s long-term scientific research in the field of stock market activity and the dynamics of government debt by establishing the relationship between the dynamics of these processes and highlighting those stock market indicators for which links with debt dynamics are more important.

In the 41-pages study, there are meets the requirements of a study of this scale, the authors aim to comparatively study the relationships between the two processes through an innovative approach and object of study.

The topic is relevant due to the trend of increasing total debt burden in both developed and developing economies as a result of increased government spending due to the global financial and economic crisis - time period, object of study and analyzed in studies.

To substantiate the conclusions of their study, the authors uses two postulates: there is a strong inverse relationship of debt burden on investment activity and that the sensitivity of capital markets to government debt dynamics; It is stronger than the reaction of investment in the real sector, which is determined by the nature of indirect investments and the rapid transfer of capital through liquid stock markets. The authors maintain that the stock market activity is a function of a set of economic and political factors despite the specifics of indirect investments and the rapid transfer of capital through liquid stock markets. These two postulates also represent the ideological-analytical platform on which the evidence and conclusions of the authors are based.

The developing of the theory of the close relationship between the stock market and the debt market, the authors base the systematics of the methods of government debt

management and highlight the dependencies with key macroeconomic factors. The systematics of the methods of government debt management and the in-depth look at all their effects provide a basis for the correct identification of the priorities of the budgetary policy, in which unannounced goals can be read.

The scope of concepts such as investment activity and stock exchange activity is defined. The research methodology includes a selection of the main measures for the structure and severity of the government debt and the specific indicators and indicators for analysis of the investment activity. After a thorough, competent and in-depth analysis of publications at home and abroad on government debt, ways of managing it and its relationship with other macroeconomic variables. The authors offer their original approach to a relatively innovative approach to the processes and phenomena underlying of the overall sustainable state of the financial system. To study the dependencies between the two processes, Simeonov, Markova and Peneva makes specific comparisons between the debt and investment indicators, as well as a correlation analysis to establish a level of relationship between the analyzed pairs of indicators. The parallel the debt dynamics and the investment activity analysis in the real sector and on the stock exchanges in Bulgaria and Greece for the period 2007-2017 is realized.

A comparative study of the main ratios related to the state of the two markets - debt and stock exchange - of Bulgaria and Greece to the budget deficit, direct investment, foreign direct investment, the share of securitized debt, the turnover of highly regulated stock markets, the share of market capitalization in GDP to assess the investment potential of the stock exchange relative to the value of government bonds.

As a result of comparing the established levels of correlation, the authors establish two main dependencies:

The first concerns is the comparison between the Greek and Bulgarian stock exchanges through the ratio of stock market activity to Greek government debt, compared to stock market and debt values for Bulgaria. The authors have concluded that both economies show a declining trend in investment activity ratios, but the negative trend for Greece is much stronger. Despite the modest indicators for the scale of BSE-Sofia, the relative investment activity to the debt burden puts Bulgaria in a much better position compared to Greece.

As a next one for both economies' dependencies the authors find that the dependencies between the debt dynamics and the activity of the stock exchange are stronger than those with direct investment in the real sector. Stronger and more statistically significant dependences between the dynamics of the structural elements of the government debt are shown by the indicators for the Greek capital market, while for the Bulgarian Stock Exchange they are weaker. This, although indirectly, argues one of the sub-hypotheses that other factors of economic and political nature have a more serious impact on the activity of the Bulgarian capital market.

The results show the activity of both stock exchanges has a clear negative trend since the beginning of the global recession, which has been going on for ten years. A strong inverse relationship is established between the main stock market indicators of the Athens Stock Exchange and the Greek debt as structural components. For the Bulgarian capital market these dependencies are less pronounced. The arguments are presented for a critical negative impact of the debt burden on investment activity in the real sector, expressed by the correlation between the dynamics of debt, the direct investment in the national economy and foreign direct investment.

As an advice to the authors for further research in this area, I recommend that the reserves of the system be included as variables and ratios, as a feature of the Currency Board and the growth rates of debt securities valued on international financial markets as a premium. risk and possibility to be used as an early warning system for the occurrence of another instability and possible crisis.

The study "Dependence between government debt and investment activity, parallel analysis of the processes in Bulgaria and Greece" is of interest not only to academic and research audiences, but also to policy makers who can benefit from the established relationships and dependencies in the studied market - debt and stock exchange, in forming a strategy for optimizing the government debt time and activating the highly regulated markets with alternative investment instruments.

Cited as:

Simeonov, St, S. Zarkova, An. Paneva. (2018). *"Dependence between government debt and investment activity, parallel analysis of the processes in Bulgaria and Greece"*, Research Almanac. SA DA Tsenov - Svishtov, № 3, p.412-452.

REVIEW FOR MONOGRAPHY «MARKET EFFICIENCY OF THE CAPITAL MARKETS FROM CENTRAL AND EASTERN EUROPE» (ed. by Assoc. Prof. Elena Stavrova, PhD in Economics)

The monography submitted for review, with author Chief assistant professor Dr. Vladimir Tsenkov, Lecturer in the Department of Finance and Accounting at the Faculty of Economics, SWU "Neofit Rilski", has the task to realize the long-term scientific research interests of the author in the field of the Efficient market hypothesis, one of the fundamental theories in the modern economics at the present stage.

The economic efficiency of the capital markets of the countries of Central and Eastern Europe as a process of manifestation is an object of interest, as they are still in the process of institutionalization and consolidation. On the other hand, this process makes them more unstable and vulnerable to inefficiency in the context of Efficient market hypothesis which implies full and efficient incorporation of all available market information.

The monography contains five chapters, preface, conclusion, bibliography, and appendices. The literary sources are 119 titles in Bulgarian and English.

The first chapter is entitled "Market efficiency and its indicators" and is focused on an overview of the concept of "market efficiency" and its theoretical prerequisites. The main aspects in which the violation of the Efficient market hypothesis is registered are presented and systematized.

The second chapter, entitled "Market efficiency of the Bulgarian capital market, determined by the global crisis of 2008 in the context of the relationship with DJIA and DAX", is dedicated to the main idea that the impact of foreign market indices on the Bulgarian market index SOFIX represents a significant violation of efficiency of the Bulgarian market in terms of the theoretical assumptions of Efficient market hypothesis. The Bulgarian capital market can be described as informationally inefficient, as the impact of the market impulses of the global economy leaves it significant and relatively long-lasting impact on the Bulgarian market dynamics.

Of particular contribution is the author's conclusion that "the reflection of DJIA in the model of return from SOFIX, during the crisis period, characterized by a negative trend of both indices, shows that 47.28% of the volatility of the Bulgarian index can be explained with the influence of the US index. During the pre-crisis period, the impact on the volatility of SOFIX on the return of the DJIA did not cause a significant reaction in size". This information asymmetry is market as one of particular importance for the successful forecasting of the dynamics of the Bulgarian capital market.

The third chapter of the monography is entitled "Crisis Impacts between Developed and Emerging Capital Markets - Following the Example of Central and Eastern European Countries". This chapter provides synthesized information on the

impact of major German and US stock indices on the capital markets of most of the Central and Eastern European countries.

The fourth chapter examines the post-crisis recovery of the financial markets of Central and Eastern Europe.

The fifth chapter of the monography summarizes the issues related to the efficiency of the capital markets of the countries of Eastern and Southern Europe by studying the links between the quotations on the capital markets and their relationship with business trust and consumer trust. The results are presented in terms of Real Business Cycle Theory, George Maynard Keynes's Theory, and Milton Friedman's Principles of Permanent Income.

The monography would have gained and received additional admiration if it had also considered the connection with the standard theory of capital asset pricing.

I would like to recommend the author to expand the scope of the study by including the impact of major market indices in the context of the Single Price Law and to take into account and quantify the impact of exchange rate dynamics.

I believe that a change in the title such as "*Market efficiency and homogeneity of capital markets in Central and Eastern Europe*" would more fully and correctly reflect the content of the monography, a remark that the author must consider whether to accept.

From all the grades and recommendations shared so far, I can conclude that I highly recommend the publication of the peer-reviewed monography and its use in the educational process of students at the Faculty of Economics at South-West University "Neofit Rilski" -Blagoevgrad, its access to the distribution network, as well as its translation and publication in English to acquaint a wider audience with the achievements of my highly respected colleague Dr. Vladimir Emilov Tsenkov.

Assoc. Prof. Elena Stavrova,
South-West University “Neofit Rilski”
01 September 2017

REVIEW

FROM ASSOC. PROF. DR. TODOR POPNEDELEV, FACULTY OF HISTORY, SOFIA UNIVERSITY "ST. KLIMENT OHRIDSKI" ABOUT THE MONOGRAPH OF PETAR PARVANOV "SLAV IN HIS HOMELAND, BULGARIAN ABROAD", ED. AVANGARD PRIMA, SOFIA 2019, 354 P.

The research is dedicated to the life and multifaceted public, political, journalistic, scientific-organizational and research work of Stefan Savov Bobchev. He is a person who has a lasting influence on the Revival life of our society, but mostly on its development in the late nineteenth century and until the 40s of the twentieth century.

The author of the monograph, Dr. Petar Parvanov, presents a study that includes a rich documentary database contained in various archives in the country. It gives him the opportunity to build a well-founded text that meets his goal to present a comprehensive view of the life and work of Stefan Savov Bobchev. The good bibliographic awareness of the author, as well as his studies in historiography, also contribute to its achievement.

The content of the monograph is structured in an introduction, two chapters, a conclusion, the necessary references to sources and literature, and at the end a biography of Stefan Savov Bobchev is included. In them, the author has managed to fully present the construction of the worldview of this remarkable historical figure, to trace his active life path through the decades of his fruitful life. The merit of his research is that the reader discovers this against the background of the cultural and political needs of our society. The audience gets an idea and in which areas and to what extent Stefan Savov Bobchev has managed or not to actively intervene.

A positive emphasis in the monograph is the inclusion of psychological characteristics of politics and the public, its reactions in certain situations. This makes its presentation full-blooded and avoids the common staticity in such research.

In conclusion, I would like to point out that the monograph will find a wide audience, both among scientific circles and in circles that are interested in the real development of our nation, without being specialists. The excellent stylistics of Dr. Petar Parvanov also contributes in this direction.

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