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Poštovani,

Ovaj 35. broj periodične publikacije Zbornik radova Ekonomskog fakulteta u Sarajevu/Sarajevo Business and Economics Review (SBER) simbolično objavljujemo u godini kada Ekonomski fakultet Univerziteta u Sarajevu obilježava 65 godina postojanja. U Zborniku radova 2017 objavljeno je 2 originalna naučna rada, 5 preglednih naučnih radova, 3 stručna i 1 studentski rad.

Sa velikim zadovoljstvom Vas informišemo da smo u ovom broju imali priliku objaviti najbolje radove sa prestižne "Međunarodne konferencije o zvaničnoj statistici ICOS2017: Izazovi, mogućnosti i pravci", održane u organizaciji pod pokroviteljstvom Ekonomskog fakulteta u Sarajevu. Nadamo se da ćemo time opravdati i Vaša očekivanja i ponuditi pregled nekih od najvažnijih ideja i trendova iz oblasti koja u cijelom regionu nudi prostor za snažno unaprjeđenje.

Ovom prilikom podsjećamo da je SBER od 2007. godine uvršten u bibliografsku bazu EBSCO PUBLISHING – BUSINESS SOURCE COMPLETE (Journals & Magazines) http://www.epnet.com/titleLists/bt-journals.xls, a od 2009. godine u CEEOL (Central and Eastern European Library) bazu (http://www.ceeol.co). Od 2011. godine SBER je uvršten i u ProQuest Business package platformu, kao jednu od najprestižnijih svjetskih baza podataka iz oblasti ekonomije i biznisa.

Godina 2017. je godina kada Ekonomski fakultet u Sarajevu (EFSA) može biti zadovoljan činjenicom da pripada zajednici najboljih fakulteta u jugoistočnoj Evropi, o čemu svjedoče najprestižnije međunarodne akreditacije za ocjenu kvalitete: američka AACSB, evropska EPAS i austrijska AQA. EFSA može biti i sretan zbog činjenice da je, od osnivanja do danas, iznjedrio više od 25.000 alumnija, i da u svom ansamblu okuplja 60 međunarodno referentnih nastavnika.

Biti indeksiran je veliki uspjeh za Zbornik radova/Sarajevo Business and Economics Review jer nas to čini dostupnim širokoj međunarodnoj naučnoj zajednici. Za nas, to znači dodatni angažman ali i obavezu s ciljem kontinuiranog poboljšanja kvaliteta objavljenih radova.

Glavni i odgovorni urednik,

Prof. dr. sc. Kemal Kozarić, dekan Fakulteta

A word by the Editor

To Whom It May Concern,

We publish this 35th issue of periodical publication The Collection of papers of School of Economics and Business in Sarajevo/Sarajevo Business and Economics Review (SBER) symbolically, in the year when School of Economics and Business in Sarajevo, University of Sarajevo, marks its 65 years of existence. In the Collection of papers 2017 there are 2 original research papers, 5 review papers, 3 professional papers and 1 student paper.

It is with great pleasure that we inform you that in this issue we had the opportunity to publish the best papers from the prestigious "International Conference on Official Statistics ICOS2017: Challenges, Opportunities and Trends", organized under the auspices of the Faculty of Economics in Sarajevo. We hope to justify your expectations and offer an overview of some of the most important ideas and trends in the field.

We use this opportunity to remind you that SBER has been a part of the bibliographic data base EBSCO PUBLISHING – BUSINESS SOURCE COMPLETE (Journals & Magazines) http://www.epnet.com/titleLists/bt-journals.xls since 2007, and a part of CEEOL (Central and Eastern European Library) data base (http://www.ceeol.co) since 2009. In 2011 SBER was also included in ProQuest Business package platform, which is one of the most prestigious world data bases in the areas of economics and business.

2017 is the year in which School of Econimics and Business in Sarajevo (EFSA) can be satisfied with the fact that it belongs to a group of the best faculties in South East Europe, and the proof for that are the most prestigious international accreditations for quality assurance: American AACSB, European EPAS and Austrian AQA. EFSA can also be satisfied with the fact that, from its establishing until today, it has produced more than 25 000 alumni, and that it has 60 internationally recognized professors in its ensemble.

It is a great success for The Collection of papers of School of Economics and Business in Sarajevo/Sarajevo Business and Economics Review to be indexed, because it makes us available to a wider international research community. For us, it means an additional engagement, but also an obligation with the aim of a continuous improvement in quality of published papers.

Editor in chief,

Kemal Kozarić, Ph.D, Dean of the Faculty

ORIGINALNI NAUČNI RADOVI

ORIGINAL PAPERS

HOW CAN CAPITAL MARKET SPUR ECONOMIC GROWTH IN EUROPEAN TRANSITION COUNTRIES? QUALITATIVE FIELD STUDY: BOSNIA AND HERZEGOVINA

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Abstract

After many quantitative research papers confirmed positive relationship between capital markets and growth, this article gives qualitative insight into this relationship. It focuses on transition countries and reasons why capital market in these countries had low performance.

We performed a qualitative field study, in order to get deeper insight into primary market activities, and to evaluate overall capital market of Bosnia and Herzegovina.

The results show that reason for low overall evaluation of B&H capital market is low level of primary securities issues, which is caused by existence of investment banks and strong financial intermediaries, the knowledge and readiness of companies to issue new securities, and existence of perspective projects in the real sector. Only last item has received high assessment, while all other failed the test. The government should focus on those items in order to develop capital market.

Keywords: *capital market, economic growth, qualitative research, transition countries, CMD model*

JEL classification: *G00, O16*

INTRODUCTION

Most of the empirical findings have discovered positive relationship between finance and economic growth. Also, both sub segments of financial markets (banking sector and capital market) have shown positive impact on growth, when examined separately. Furthermore, some researches find out that economies with more developed capital markets perform better than those with less developed capital market (bank centric systems). It is of big importance for this paper to put more emphasis on capital market, since financial theories, empirical findings and historical trends prove that too strong banking sector creates unstable financial and economic system.

Most of papers that investigate the relationship between capital market and economic growth concentrate on empirical research. Very little attention has been paid to the essence of capital markets and reasons how and why capital markets influence growth.

The essence of capital market is to channel free capital funds in one economy into real sector projects that would spur economic growth. However, researchers in their empirical works use secondary capital market ratios (market capitalization as percentage of GDP, securities trade as percentage of GDP, and securities trade as percentage of market capitalization) in order to measure development of capital market as a whole. Even if secondary capital market in developed countries partially reflects overall development of capital market, it could not be stated for transition countries. The reason is that capital markets in those countries evolved overnight, through the process of large scale privatization, unlike capital markets in developed countries, where secondary and primary segments were developing simultaneously and naturally over the history. Thus, secondary capital market in transition countries is not even close reflection of what is going on in the primary market. So, having good secondary capital market ratios, without having new issues of securities, could not spur economic growth, even if empirics suggest positive and significant relation.

For that reason, research in transition countries requires more qualitative analysis, in order to investigate in depth reasons of lower capital market development. The key research questions here are to find out main factors that limit capital market development in Bosnia and Herzegovina and how to overcome those limitations in order to have stronger economic growth.

1. THEORETICAL BACKGROUND AND LITERATURE REVIEW

Theory and recent empirical research show that financial system plays an important part in the growth of economy. Solow growth model (Solow, 1956) suggests main growth factors to be human and physical capital. It is a dynamic economic model that shows how economy changes and grows through the time by increasing level of production per worker, which is stimulated by increase of savings, investments, technological advancements and organizational improvements. Special contribution of Solow model is the importance of savings, which enter official flows (through financial intermediaries) and find a way to investors who have ideas and are capable to invest in new projects, which will in turn increase level of production and economic growth.

As suggested by Beck (2006), developed financial market stimulates economic growth through following factors:

- it helps mobilizing and pooling savings from investors,
- it efficiently allocates resources to the most productive uses (higher quality of information about companies and prospective development projects in economy,
- financial markets participants efficiently monitor investments through corporate governance mechanisms,
- it eases exchange of goods by providing payment services,
- it helps risk diversification.

All of these factors must be supported by macroeconomic stability, good legal system and free flow of information (Beck, 2006).

When distinguishing between importance of banking sector and capital markets, capital structure theories made great contribution. Stiglitz (1969) criticized capital structure irrelevance theory by Modigliani and Miller and came up with the conclusion that higher debt leverage decreases the value of the company, due to increased bankruptcy risk. Market-based system is important because of few shortcomings in a bank-based structure. Firstly, in the absence of a market-based system, bank intermediaries with great influence on a firm may use their power to extract more from future profits of the firm. In turn, firms' ability to invest in innovative and profitable ventures is reduced. Secondly, the market-based approach is believed to more effectively exert corporate governance through identification, isolation and bankruptcy of distressed firms. Lastly, market-based systems are able to provide more tailor made risk management tools as the economy matures and the methods to raise capital increases (Levine, 2004).

Also, analysis of historical economic trends show that banks, through speculative behavior, have been causes for most of financial and economic crises (Minsky, 1992).

This all goes in favor of need for stronger capital market development generally.

Even though theoretical backgrounds suggest positive role of capital markets in the growth of economy, empirical research in past decades gave different and contradicting results.

Schumpeter (1911) made the first theory and suggested positive relation between finance and growth. The first serious empirical research was done by Goldsmith (1969). He tested and found positive relationship between financial sector (measured by total assets of all financial intermediaries) and growth for 35 countries, during the period from 1860-1963. He also showed that non bank intermediaries are growing as economy develops. Goldsmith partially proved causal relationship, where growth has positive influence on financial development. One of the most comprehensive researches was done by King and Levine (1993), when they found positive relationship between all four variables (all were related to banking sector) and growth. Other important works (Greenwood and Jovanovic, 1990; Berthelemy and Varoudakis, 1996; Arcand et al., 2011; Rousseau and Wachtel, 1998; Levine, Loayza and Beck, 2000) found positive and significant relationship between finance and growth, while Calderon and Liu (2003) fond that growth influences financial development (causality).

After some time, researchers started investigating separate effects of banking sector and capital markets on economic growth. It was possible only when capital markets were developed enough and when quality of data allowed such an analysis. One of the first works in influence of capital market on growth was done by Atje and Jovanovic (1989) where they found positive relationship between capital market and growth, while, at the same time, significant influence of banking sector on growth was not found.

Levine (1991) and Bencivenga, Smith and Starr (1996) show that stock markets can influence growth through liquidity increase, and similar work by Obstfeld (1994) show that risk diversification over globaly integrated stock markets is additional chanel through which stock markets can stimulate growth. Similarly, positive relationship has been found by Atje and Jovanovic (1993), Singh (1997) and Levine and Zervos (1998).

One of the most important findings, from the aspect of this paper, have been presented by Demirguc-Kunt and Levine (1996a). They claim that economies with more developed stock markets have beter developed overall financial system. More developed markets are more liquid, less volatile, more globaly integrated, have more developed institutions with strong transparency laws, have international accounting standards and free capital flows compared to smaller markets.

Rousseau and Sylla (1999) get results which show that stock markets played key role in the growth of American economy during 19th century, since it attracted significant foreign capital. Durham (2002) found out that positive influence od capital market development depends on inclusion of more developed countries in regression model, which limits the role of less developed countries.

On the other side, some research papers did not find significant relation between finance and growth. Robinson (1952) proposed that finance follow real sector development, what suggests existence of reverse causality in this relationship. Lucas (1988) claims that role of finance in economic growth is overemphasized, while Stiglitz (1989) and Mayer (1989) did not find significant relationship at all. Filer, Hanousek and Campos (2003) conclude that weak connection exists between stock markets and growth, especially in less developed countries, and that stock market activities cause currency appreciation. They argue that efficient alternative channels of finance exist in the countries with less developed capital markets.

While number of papers has been exploring significance level of relationship between capital market and growth, very few researchers tried to use qualitative approach and to investigate real reasons and limitations for low level of capital market development. One of the most outstanding works in qualitative research of capital markets has been done by Fredholm and Taghavi-Awal (2006). They created Capital Market Diagnosis (CMD) model and applied it to the capital market in Georgia. This model is most suitable for transition countries and it helps investigate different qualitative aspects of capital market, what can help policy makers and other interested parties to make certain agenda and decisions.

2. METHODOLOGY

While most of the finance-growth research has been done empirically, this research strives to get in depth, qualitative analysis of real causes of low capital market development. Previous empirical works focused more on developed

markets and proved significantly positive influence of capital market on economic growth. Furthermore, better development of capital market could enhance the economic growth. We are also aware that primary segment of capital market is crucial for the overall capital market development and economic growth, since only efficient allocation of capital through securities issues can spur economic growth. Transition countries, however, witnessed unnatural capital market development, where large scale privatization stimulated only secondary capital market. In these markets, primary securities issue is rarity. Therefore, this research goes under the surface in order to find out reasons that limit capital market development in transition countries.

For that purpose, we performed qualitative field study in Bosnia and Herzegovina by application of CMD (Capital Market Diagnosis) model developed by Fredholm and Taghavi-Awal (2006), and we believe that findings and recommendations could fit most of European transition countries. The objective of field research in economics is to get beneath the surface, to contrast observed behavior with the prevailing understanding of a process, and to relate language and description to behavior (e.g. Deirdre McCloskey, 1985). In our research process, CMD model firstly has been revised and improved, and afterwards used to estimate current level of capital market development in Bosnia and Herzegovina. The model was used for the purpose of diagnostics. Diagnostics is the way to understand and interpret participants and situations through deep insight (Arbnor and Bjerke, 1997).

Research data has been collected from primary sources by use of qualitative methods of collection, with the focus on interviews with experts from different fields. The nature of interviews could be described as semi structured interview form. Besides that, publicly available secondary data were also collected from different sources. Since Bosnia and Herzegovina consists of two entities (Federation of B&H and Republika Srpska) with two parallel and similar financial systems, the research is limited to Federation of B&H, especially for the collection of primary data through interviews. It is assumed that Federation can be a good representative of Bosnia and Herzegovina, since capital markets in both entities are very similar.

3. ANALYSIS: APPLICATION OF CMD MODEL IN BOSNIA AND HERZEGOVINA

3.1 Basic facts on growth and financial sector development

Bosnia and Herzegovina is situated in the region of south-east Europe. After the war (1992-1995), which destroyed most of economic and production potential, it entered transition from socialism to capitalism. From 1996 until today B&H made significant improvements and its GNI increased from 750 US$ (1996) to 4.760 US$ (2014) what placed B&B to higher medium ranked countries (World Bank classification, Atlas method).

Development of financial sector started immediately after the war with restructuring of banking sector and with privatization of state property. Most of state owned companies were offered in the public offer of shares to local investors for privatization certificates. At the same time, all necessary capital market infrastructures were created in both entities separately (Federation of B&H and Republika Srpska). The whole process of large scale privatization was supported by privatization investment funds, which were main intermediaries between investors (citizens) and companies subject to privatization.

GDP per capital growth in B&H, during the period from 2000-2009, was decent (4-6,5%), while after 2009 it decreased due to economic crisis.

3.2 CMD model description

CMD model is a diagnosis tool that helps estimate the level of development of capital market in particular county. It consists of three parts (steps), and each step has number of different components and answers that should be answered. After completion of those analysis, it is possible to get broad and clear qualitative picture about capital market and its shortcomings.

CMD model with its improvements (underlined items) is presented in the following table.

Table 1 CMD model (three steps)

STEP 1: Necessary conditions
Peace in the country
Internal security in the country
Government control
Rule of law
Property rights

STEP 2: Supporting factors		
Capital availability	**Investment opportunities**	**Macro environment**
Savings rate	Market capitalization	Population
Pension system	Number of companies	GNI per capita
Foreign portfolio investments (FPI)	Availability of bonds	GDP growth
Corporate governance	Shadow economy	Political commitment
Information	Issue reluctance	Banking system
Law	Practice and historical trends in issuance of securities*	Inflation
Transaction costs	Existence of perspective investment opportunities in real economy *	Corruption
		GINI index
		Sovereign rating

STEP 3: Capital market development			
Pre-trade	**Trade**	**Post-trade**	**Regulatory**
Brokerages	Exchange	Clearing and settlement	Ministry of finance
Investment banks	Off-exchange	Custody	Supervision
Mutual and investment** funds			Central bank
Insurance companies**			
Pension funds**			
Risk capital funds**			

* Modification of the model due to unclear interpretation in the segment of "Existence of investment opportunities"

** Revision due to improvement of the CMD model

Source: CMD model (Fredholm i Tahhavi-Awal, 2006) with revision and modifications

3.3 CMD analysis

3.3.1 Step 1: Necessary conditions

Questions:

- **Is there a peace in the country? Yes.**

After the war has ended, there were no more conflicts in B&H.

- **Is internal security situation acceptable? Yes.**

Since the end of war, there were few sporadic security incidents that were no part of organized terrorist actions.

- **Is the government functioning and in control of the territory? Yes.**

Some of institutions are functioning at the state level (B&H Army, State Agency for Investigation and Security – SIPA) and some at the entities level (Police forces). Generally, government, with all its institutions controls territory of B&H.

- **Is there rule of law and sufficiently strong and independent legal institutions? Yes.**

Legal system, except for some shortcomings and inefficiencies, functions well.

- **Is there protection of property rights and free private ownership? Yes.**

Property rights are well protected and free private ownership guaranteed.

Assessment: **The necessary conditions required for capital market are present in B&H.**

3.3.2 Step 2: Supporting factors

The analysis of supporting factors is given in the following table:

FACTOR	VALUE	COMMENT
Capital availability		
Savings rate	Gross savings rate (% BDP): 10,94% (This is important indicator of existence of free money that could be channeled to capital market)	Savings rate in B&H during period from 2005.-2014. was in range from 9%-16,7%. Comparing to countries in the region, if we exclude Montenegro (5%), B&H is at the bottom, together with Serbia (11%) and Albania (12%). Slovenia (27%) and Macedonia (29%) have highest rates in the region. However, in the developed world the situation is not much different, and the rate goes from 12% (Great Britain) to 38% (Norway), and with US (18%), Italy (18%), Japan (22%), Germany (27%), and Switzerland (38%) in between. *Source: WDI, World Bank.*

Pension system	System of the general compulsory pension insurance based on intergeneration solidarity (pay-as-you-go system), with public pension fund,	B&H is planning pension system reform, which will keep existing PAYG public fund and introduce two additional funds, whose payments will be tied to workers names and those funds will be available for investments in the financial markets in order to provide additional return, and to increase their future value, at the time when they retire. This reform could create significant potential for capital market development. *Source: International Labor Office (2009).*
FPI (foreign portfolio investments)	34,93 mil US$ in 2011., which makes 7,7% of total exchange turnover in B&H, or 1,54% of market capitalization.	Ideal ratio for FPI would be percentage share of market capitalized foreign owned shares in total market capitalization. This ratio for B&H does not exist, so we took share of foreign portfolio investments in total exchange turnover and in market capitalization. Significant share of foreign investors makes local securities markets unstable because of possible sudden withdrawal, on the one hand, while having very important role in terms of liquidity and pressure on transparency standards and protection of ownership rights on the other side. *Source: World Bank database and Annual Report Central Bank B&H (2011).*
Corporate governance	Moderate level	Even though the system of corporate governance and level of education in terms of law, procedures and process of corporate governance are at the high level, transparency and protection of small shareholders are not at the satisfactory level. Financial reports are public, but the level of reliability is still questionable, due to existence of shadow economy. External auditing could be considered reliable in the case of big international auditing companies. Special aspect of "responsibility of supervisory board members" is also not at the adequate level, since board members most often represent interests of shareholders that appointed them to the boards, and not interests of the company as prescribed by law. *Source: Estimation of corporate governance B&H, World Bank (2006).*
Availability of information	General assessment: Low level 1. Analysts: Low level 2. Rating agencies: Low level	None of four components from CMD model is satisfactory. 1. Market analysts almost do not exist. Few investment funds have medium to high quality analysts, but for their own needs. Brokerage companies often provide incorrect and bias information for the purpose of market manipulation. 2. Rating agencies do not exist in B&H. The only ratings are done by Standard & Poor and Moody's Investor's Services just for the government rating. 3. Financial journalism is at very low level. Besides few medium quality business portals, there are no other serious financial media.

	3. Financial journalism: Very low level 4. Financial literacy: Very low level	4. Financial journalism is at low level and government and NGO institutions are not active in terms of education. *Source: interview Nedim Šaćiragić, Director, LILIUM ASSET MANAGEMENT (DUIF) Ltd.*
Laws on ownership and investment Transaction costs	Index of the ownership rights strengths: 7 (0-weak, 12-strong); Medium level Satisfactory level	Well developed in terms of legal framework, but inefficiency of courts and weak arbitrage platform reduce the assessment level. Source*: World Bank WFI.* Transaction costs are relatively low because of big competition, and this is important for the stimulation of market. Average approximate costs of trading are 1%, while entry and exit fees for mutual funds are between 1-2%. *Source: Interviews with Adi Ahić, Director, VGT broker and Nedim Šaćiragić, Director LILIUM ASSET MANAGEMENT (DUIF) Ltd.*
Investment opportunities		
Market capitalization	Medium level (12,36% of GDP, 2011)	Compared to countries in the region, B&H has medium level of market capitalization (Romania 8%, Slovenia 12%, Serbia 4%), and compared to most developed countries it has relatively low level of market capitalization (US 100%). Positive fact for B&H is that level of share prices, after drastic fall due to crisis have never recovered, what could be a good potential for investors in the future. *Source: World Bank database, interview Nedim Šaćiragić, Director LILIUM ASSET MANAGEMENT Ltd.*
Number of listed companies	Low to medium level: 743 companies (2012)	According to World Bank data, B&H has very high number of listed shares compared to even developed markets. However, we suspect that methodology of gathering these data in B&H was wrong, and that there were considered all the companies that were ever traded. In other markets, only listed shares are considered to enter this data. *Source: World Bank WFI, official web page of SASE (www.sase.ba).*
Bond market	Low level: value of all issued bonds on 18.4.2016. is 7,9% of GDP	In government bonds segment, there is medium level of issuance (7,5% of GDP), while in the segment of corporate bonds, level is very low (0,4% of GDP). *Source: SASE, BLSE, CBBH.*
Shadow	Medium level	According to MIMIC index (Schneider et al., 2010), B&H has

economy		medium level of shadow economy transactions (33,6% of GDP during period 1999-2007). Average level for 162 countries was 33% of GDP, for the mentioned period.. *Source: Schneider (2010).*
Issue reluctance	Very low level	Reasons for very low level: - low education level in terms of capital market financing benefits, - low level of trust in capital market since main participants are brokerage companies (not popular because of market manipulation in the past) and privatization investment funds (they failed to restructure companies that they bought in privatization), - fear from the loss of control in the ownership, - no investment banks in the market and low level of institutional investors initiatives to stimulate companies to issue new securities, - low level of free cash flows with institutional investors, ,which are main buyers of new securities. *Source: interview Nedim Šaćiragić, Director LILIUM ASSET MANAGEMENT Ltd. and Hajrudin Hadžimehanović, vice minister, Ministry of finance FBiH.*
Historical trends and practice in securities issues VP*	Very low level	Besides government bonds, municipal bonds and treasury bills issues, there were no much share and corporate bond issuances in the history. The most famous issue had occurred in 2007, when Sarajevo insurance issued shares and collected 24 mil KM (12 mil EUR). *Source: SASE, KVPFBiH, BLSE*
Existence of perspective investment opportunities in real economy *	Medium level	B&H has many unused potentials for future development projects. High unemployment rate (28% in 2014, according to World Bank data) and low level of GDP per capita give opportunity to investors to find cheap labor. Besides that, B&H has got high level of natural resources (mines, wood, drinking water and energy potentials, fertile land, natural beauties, etc.) that could attract future investments. Investment potentials could be found in the electricity production, tourism, food processing, furniture production, textile production, outsourcing services (IT, finance, administration, call services), construction, car industry etc. Limiting factor could be the low government support and scarcity of managerial personnel to explore all mentioned opportunities. *Source: interview Mr. Sanela Pašić, Executive Director, Raiffeisen Bank d.d. Sarajevo*

Macro environment		
Population	3.827.343 (estimate for 2014)	B&H in terms of population is small country, and as such it has smaller potential for capital market growth. *Source: Agency for statistics B&H*
GNI per capita	4.840US$ (2014)	B&H belongs to the group of higher-medium ranked countries, according to World Bank classification. *Source: World Bank, Atlas method*
GDP growth	1,1% (2014)	*Source: World Bank, 2016; IMF*
Political commitment	Low level	In all interviews there was a question on political commitment and government strategy in the capital market development, and all interviewees answered that government does not understand the role of capital market and does not know which methods to use in order to stimulate. However, the representative of ministry of finance in Federation of B&H said that capital market development strategy was adopted in 2014, but the set of laws was not adopted yet, due to political crises and due to the fact that capital market development is not of high priority. But, the strategy itself discusses the most important issues, such as how to channel savings from banks to capital markets, how to lower the power of banking sector and how to ensure this flows go more into companies to finance development. It is interesting that this strategy was initiated by local authorities, not by international community. The reason why market participants have negative attitude towards the government is the historical experience and behavior of government, as well as the fact that mentioned strategy was not yet communicated to participants. *Source: interview Hajrudin Hadžimehanović, vice minister, Ministry of finance FB&H.*
Banking system	Medium level	Out of all financial sectors in B&H, banking sector is the most developed one. Foreign bank ownership in majority of banks (87% of market share by foreign owned banks) helped banking sector retrieve the trust after the collapse of the financial system due to war. The situation in FB&H is far better compared to Republika Srpska (two banks in RS failed in 2014 and 2015). Stability and development of banking sector has negative impact on capital market development, since banks control companies through long term loans and they do not stimulate companies to make new issues of shares, because financing from capital markets represents competition to banks. If banking sector is to be threatened by capital market in the

		future, banks will answer with lower interest rates in the short term and with involvement in capital markets (establishing of their own investment funds) in the long term. *Source: interview with Amir Softić, Executive Director, Sparkasse Bank B&H and Banking Agency FBiH.*
Corruption	CPI (Corruption Perceptions Index): 38 (2015.)	CPI is index of corruption perception (100-low level; 0-high level). B6H is ranked at 76th position out of 168 countries included. *Source: Transparency International (2016)*
Inflation	Inflation rate: -0,9% (2014.)	*Source: Central Bank of B&H*
GINI index	33 (estimated by World Bank exist only for 2007)	Index (0-100) measures inequality of income redistribution (0-perfect redistribution; 100-high inequality). *Source: World Bank, WDI*
Government rating	Standard & Poor's: B Moody's: B3 Moody's outlook: STA	*Source: Standard & Poor's, Moody's, 2014.*

* Modification of the model due to unclear interpretation in the segment of "Existence of investment opportunities"

3.3.3 Step 3: Capital market development

In the following text we analyze capital market institutions.

Pre-trade institutions

3.3.3.1 Brokerage companies

There are eight brokerage companies on both Federation of B&H and Republika Srpska markets (total 16). Before the crisis this number was bigger, but after the crisis started, many of them failed. These companies offer different financial services such as trade for the clients' account, consulting, analysis and portfolio management for their clients.

Assessment: In this segment the competition is relatively high, what leads to moderate transaction costs with high level of service quality, especially for the service of buying and selling securities for the clients' account. Other services provided by brokerage companies are at the lower level and are often subject to biasness and price manipulation by some brokers.

Nine brokerage companies are owned by banks, which gives good signal on the one side, but, on the other side could influence the biasness and independence of their business because of the information that banks possess.

3.3.3.2 Investment banks

There is no investment bank in Bosnia and Herzegovina. Few commercial banks do have investment banking departments, but they are focused on custody and international currency trade activities. The reason for low development is the size of the market.

Assessment: This could be a serious issue for future development of capital market, since investment banks are main players in stimulating demand and supply side for new issues of securities. t is hard to assess the future development of this segment.

3.3.3.3 Mutual and investment funds

There are 34 investment funds in the B&H market (11 closed-end and 7 mutual funds in Federation of B&H, and 14 closed-end and 2 mutual funds in Republika Srpska). Total assets value amounts to 784 mil KM what makes 3,1% share in total financial sector assets.

Assessment: Most of mentioned assets are within closed-end funds that evolved from privatization funds. They are not liquid and have bad quality portfolio (the government offered mostly bad companies in large scale privatization), so they can not contribute much in the future capital market development. On the other side, mutual funds evolved in the pre-crisis time and did not develop much since then. But, in the future, we can expect stronger development of mutual funds industry. First of all, there is high savings potential on the supply side, and if demand side, in terms of new issues of securities, increases, the mutual funds industry could develop in the future.

3.3.3.4 Insurance companies

There are total of 5 insurance companies (12 in Federation of B&H and 13 in RS). Total assets amount to 1,36 billion KM, and it makes 5,3% of GDP. Life insurance premium in 2015 was as low as 120 ml KM and has great future potential. Life insurance premium is important for capital market development since most of life insurance funds are channeled to capital market.

Assessment: Insurance sector in B&H is under developed because of disloyal competition, too many insurance companies, poor regulation, low liquidity and claims settlement inefficiency. Activities in capital market are minor, even though the law prescribes certain percentage of insurance assets to be invested in securities. However, this industry has good prospects, especially when more international companies enter the market of B&H.

3.3.3.5 Pension funds

The only existing pension fund in B&H is public pension fund (one in each entity), and all inflows are used to pay current pensions (pay-as-you-go system) what prevents those funds to invest in capital markets.

Assessment: Current inflows are not even enough to pay pensions so government must borrow. The perspective of pension funds will only open with the fore coming pension reforms.

3.3.3.6 Risk capital funds

Risk capital funds do not exist in B&H but it is possible that foreign funds enter this market, if they perceive potentials in terms of start-up companies.

Assessment: It can be noticed that the trend of technology start-ups development is on rise. This gives the potential for capital markets if those companies decide to rise additional capital in domestic capital market.

Trade institutions

3.3.3.7 Stock exchange

There are two exchanges in B&H: SASE (Sarajevo) and BLSE (Banja Luka). The reason for unjustified existence of two exchanges is political separation of country into two entities, where parallel financial system is created.

Assessment: Both exchanges are at high level of development in accordance to highest global standards. Recent entry of Turkish investors in the ownership of SASE opens new perspective in terms of exchange development and attracting of portfolio investors in the East (Muslim world). Also, there is an initiative of unification of all exchanges in Balkans region.

3.3.3.8 Off-exchange trading

There is no off-exchange trading on B&H exchanges, and all transactions are done through exchanges.

Assessment: This rule is very important in terms of development of transparent and liquid capital market.

Post-trade institutions

3.3.3.9 Clearing and settlement

Registries for settlement exist in both entities.

Assessment: Both registries are established and function at the highest standards, what makes good precondition for further capital market development.

3.3.3.10 Custody

Custody for securities, as prescribed by law, is given to banks that acquire special permission for that purpose.

Assessment: These activities are done very well by banks, and so far there were no problems in this segment.

Government and regulatory institutions

3.3.3.11 Ministry of finance

Ministries of finance in FB&H and RS are the main institutions responsible for capital market development. At this level all laws and policies on capital market are being drafted.

Assessment: Capital market development, up to now, was not in the focus of these ministries. However, there is an indication that Ministry of finance of FB&H has adopted the strategy on capital market development in FB&H, which could be implemented in the near future. In case of future entries of serious financial institutions in B&H market, the government would help its development, same as in the case of banking sector.

3.3.3.12 Regulatory institutions

Securities commission of FB&H and RS are two main regulatory bodies in B&H.

Assessment: Among capital market participants in FB&H, there is an opinion that Securities commission of FB&H has not fulfilled expectations in terms of efficiency and regulation of capital market. On the other side, securities in both entities have good experts what is an important asset for future development.

3.3.3.13 Central bank

Central Bank of B&H does not have competence for monetary policies, because of currency board system. The main function of this institution is to follow and secure banking sector.

Assessment: CBB&H is not subject of analysis in this research, but it could be said that it has specific importance in terms of trust creation not only in the banking sector, but in whole financial system.

5. Discussion of results and conclusion

Field study qualitative research (with use of CMD model) that was done in the capital market of Bosnia and Herzegovina gave us in-depth insight and identified main limiting factors for its development. The main shortcoming in this market is the very low stage of development in primary capital market with very few issues of securities. CMD model has shown to be a good assessment tool for in-depth causes of low capital market development, including reasons for inactive primary segment.

Analysis has shown that general assessment of capital market in Bosnia and Herzegovina, according to most of the used parameters and measures of CMD model, is low. The main problem is existence of few securities (very shallow market), what causes saturation and fast index fluctuation. New securities are possible to come only through new issues. The main factors that could stimulate new securities issues are:

- existence of investment banks,
- existence of strong and active financial intermediaries (open-end funds, pension funds and risk capital funds),
- readiness of companies to issue new securities, and
- existence of perspective real sector projects for companies to invest after receiving capital.

Assessments for all key categories, except for the last one, are very low, what gives an answer on the research question about key factors for under developed capital market in Bosnia and Herzegovina.

However, all other parameters (necessary conditions, macro environment, legal and institutional framework, transaction costs) are in the zone of low to medium low level, and through certain modifications and priority setting by the government, those parameters, together with key factors, could be improved in the short to medium timeframe.

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KAKO TRŽIŠTE KAPITALA MOŽE POTAĆI EKONOMSKI RAST U EVROPSKIM TRANZICIJSKIM ZEMLJAMA? KVALITATIVNA STUDIJA: BOSNA I HERCEGOVINA

Rezime

Nakon što je veliki broj empirijskih istraživanja potvrdio pozitivnu relaciju između tržišta kapitala i ekonomskog rasta, ovaj rad daje kvalitativni uvid u navedenu vezu. Istraživanje se fokusira na tranzicijske zemlje i na razloge zbog kojih je tržište kapitala u ovim zemljama do sada imalo slabe pokazatelje.

U sklopu istraživanja urađena je kvalitativna područna studija, kako bi se dobio jasniji uvid u primarno tržište kapitala i napravila generalna evaluacija tržišta kapitala u Bosni i Hercegovini.

Rezultati pokazuju da je glavni razlog za nisku ocjenu bh. tržišta kapitala nizak nivo izdavanja novih vrijednosnih papira, a to najviše zavisi od postojanja investicionih banaka i jakih finansijskih posredničkih institucija, zatim znanja i spremnosti kompanija na izdavanje vrijednosnih papira, kao i postojanja perspektivnih razvojnih projekata u realnom sektoru. Samo posljednja stavka je dobila visoku ocjenu, dok su ostale ocijenjene veoma nisko. Država se treba fokusirati na navedene stavke u cilju budućeg razvoja tržišta kapitala.

Ključne riječi: *tržište kapitala, ekonomski rast, kvalitativno istraživanje, tranzicijske zemlje, CMD model*

JEL klasifikacija: *G00, O16*

UTICAJ SPECIFIČNE MANIFESTACIJE NA PERCEPCIJU TURISTIČKE DESTINACIJE – PRIMJER SARAJEVO FILM FESTIVALA

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Rezime

Ovaj rad ukazuje na nedovoljno iskorištene mogućnosti uticaja Sarajevo Film Festivala u cilju kreiranja pozitivne turističke percepcije grada Sarajeva. Ovaj rad ima za cilj da utvrdi kako Sarajevo Film Festival utiče na turističku percepciju grada Sarajeva. Jedan od ciljeva je da se na osnovu rezultata istraživanja daju preporuke za efikasnije korištenje Sarajevo Film Festivala kao faktora turizma događaja u stvaranju autentičnog i prepoznatljivog turističkog proizvoda grada Sarajeva. Sarajevo Film Festival je jedan od najprominentnijih filmskih festivala u jugoistočnoj Evropi. Održava se svake godine od 1994. u Sarajevu i ima prosječnu posjetu od oko 100.000 ljubitelja filma. U istraživačkom dijelu rada se analizira uticaj Sarajevo Film Festivala na motivaciju inostranih turista za dolazak u Sarajevo, na kvalitet iskustva boravka u Sarajevu kod inostranih turista, na buduće namjere inostranih turista da ponovo posjete Sarajevo, kao i na spremnost inostranih turista da posjetu Sarajevu preporuče drugim ljudima. U radu je primijenjen kvantitativni pristup istraživanju, koji je uključivao prikupljanje podataka putem anketiranja (Face to Face – licem u lice) ispitanika, uz korištenje anketnog upitnika, posebno kreiranog za ovo istraživanje.

Ključne riječi: *turizam događaja, industrija događaja, menadžment događaja, imidž turističke destinacije, percepcija turističke destinacije*

JEL klasifikacija: *Z32*

UVOD

Kroz period svog postojanja turizam je, kao odraz ljudske težnje za kretanjem, doživio mnoge modifikacije svojih segmenata težeći da se prilagodi promjenama na turističkom tržištu, a najviše promjenama u zahtjevima i potrebama turista. Turizam događaja je jedan od najmlađih, ali i najperspektivnijih vidova turizma čija je ekspanzija započela u posljednjim decenijama dvadesetog vijeka.

Događaji su postojali kao dio turističkog priozvoda, sa većim ili manjim značajem i utjecajem na destinaciju, ali njihova komercijalizacija inicirala je aktivnije interesovanje učesnika turizma i čitavih privreda za proučavanje ove oblasti, a sve u cilju povećanja ekonomskih i drugih koristi koje zajednica ostvaruje.

Niz zaključaka do kojih se došlo studioznijim analizama turizma događaja, pokazali su da sa pravim pristupom planiranju i organizaciji događaja mogu poboljšati ne samo ekonomski efekti, već i utjecaj koji događaji imaju na formiranje brenda destinacije.

1. EVENT TURIZAM

Među autorima postoje različiti stavovi šta sve obuhvata termin „event-događaj". Smatra se da je zajednička osobina svih događaja periodičnost i da je svaka manifestacija izuzetna pokretačka snaga za konceptualnu kombinaciju menadžmenta, programa, dekoracija i ljudi (Getz, 2005).

Autor Getz (2005) nudi dvije definicije specijalnih manifestacija, jednu sa gledišta organizatora i drugu sa gledišta gosta:

1. Specijalni događaj je jednokratni ili periodični događaj koji prevazilazi normalne programe i aktivnosti u domenu organizacije i sponzorstva.
2. Za goste, specijalni događaj je mogućnost za odmor, društveno i/ili kulturno iskustvo koje prevazilazi uobičajen izbor i svakodnevna dešavanja.

Autori Jago i Shaw (1998) na osnovu svog istraživanja uočavaju šest obilježja specijalnih manifestacija:

- privlačna je za turiste i pospješuje turistički razvoj,
- ima ograničeno trajanje,
- dešava se jednom ili periodično,
- povećava svijest o regiji, njenom imidžu i karakteristikama,
- pruža društveno iskustvo,
- po sadržaju značajno odstupa od svakodnevnih događaja.

Festivali mogu utjecati na percepciju inostranih turista o imidžu grada u kojem se festival održava. Pored porasta posjeta turista organiziranom događaju, sam događaj može privući i medijsku pozornost i povećati pristup destinaciji koja poboljšava ugled (imidž) grada domaćina ili turističke regije. Medijska izloženost uspješno organiziranom događaju može ilustrirati odliku sposobnosti, inovacija i postignuća destinacije domaćina u organiziranju događaja (Bowdin, Allen, Harris, McDonnell, O'Toole, 2012).

Pojam destinacijskog imidža dominantno je područje turističkog istraživanja već više od četiri desetljeća. U turističkoj literaturi zauzima važno mjesto još od sedamdesetih godina dvadesetog vijeka kada su Mayo i Hunt primijetili da pozitivni imidž destinacije rezultira povećanim brojem posjeta (Gartner i Shen, 1992) te od kada se shvatilo da destinacijski imidž ima važnu ulogu u procesu donošenja odluke o posjeti određenoj destinaciji.

Pozitivan imidž destinacije pomaže buđenju svijesti i podsticanju emocija vezanih za destinaciju i stoga može da posluži kao element za diferenciranje među konkurentima. Prema tome može se sa sigurnošću tvrditi da uspjeh, odnosno neuspjeh turističke privrede u destinacijama širom svijeta, u velikoj mjeri zavisi od percepcije imidža koji potencijalni turisti imaju u svojoj svijesti i od načina upravljanja tim imidžem od strane nadležnih u destinaciji (Sirgy, Su, 2000; Fakeye, Crompton, 1991).

Osim što utiču na turističku percepciju, festivali mogu utjecati i na motivaciju inostranih turista za dolazak u grad domaćina. U mnogim destinacijama posebni događaji predstavljaju važan element turističkog proizvoda, privlače određeni segment potrošača, pomažu u kreiranju boljeg imidža, a kad su na razini međunarodnih događaja utječu na stvaranje imidža cijele zemlje. Festivali se koriste kao sredstvo za privlačenje i stranih i domaćih turista i kao rješenje problema diferencijacije “proizvoda“ na sve konkurentnijem turističkom tržištu (Vrtiprah, 2004).

Festivali igraju značajnu ulogu za društvo tako što privlače turiste, imaju pozitivan ekonomski učinak, stvaraju mogućnosti za sudjelovanje u životu zajednice i zajedništvo, te jačaju imidž destinacije. Festivali i posebni događaji su se razvili u svim destinacijama te su najbrže rastući segment na području turizma (Park, Reisinger i Kang, 2008). Posebna zainteresovanost za festivale i događanja kao što su kulturno očuvanje, istraživanje lokalnih specijaliteta i kulture, te uključenosti u funkcioniranje lokalne zajednice doveli su do povećanog naglaska na regionalne i lokalne festivale. Prema Historic/Cultural Traveler (2003), oko 41

% putnika prisustvovalo je festivalu i/ili sajmu tokom svog putovanja. Brojne studije su provedene na festivalima i događanjima gdje je pokazano da isti mogu imati brojne prednosti za zajednice (Getz, 1993). Međutim, mnogi festivali su još uvijek u ranoj fazi kad je u pitanju praktično upravljanje i teorijsko istraživanje, a posebno filmski festivali čiji broj se svake godine povećava, što skreće pažnju organizatorima i istraživačima na polju destinacijskog marketinga.

Brojne studije su provedene kako bi ispitale motive turista i široko je prihvaćeno da motivi turista igraju važnu ulogu u turističkom planiranju i marketingu. Veliki broj prethodnih festivalskih studija pokazao je da je prepoznavanje motivacije posjetilaca ili turista za određenu temu ili vrstu festivala vrlo kritičan korak u uspješnom planiranju i održavanju festivala (Uysal, Gahan, Martin, 1993; Mohr, Backman, Gahan, i Backman, 1993; Backman, Backman, Uysal, i Sunshine, 1995, Scott, 1996; Formica i Uysal, 1996; Formica i Uysal 1998; Schneider i Backman 1996; Crompton, McKay, 1997).

Nekoliko studija je provedeno kako bi se pronašao jednostavan i standardiziran način mjerenja i uspoređivanja motivacije turista. Dann (1981) i Crompton (1979) razvili su model za mjerenje motivacije pomoću faktora poticanja i privlačenja. Faktori poticanja proizilaze iz pojedinca i utiču na želju za putovanjem. Faktori privlačenja su stvari izvan pojedinca i više su vezane za odabir određenih destinacija nakon što su želju za putovanjem već ostvarili faktori poticanja. Faktori poticanja su želje da se pobjegne iz svakodnevnog života ili da se pronađu nove avanture, a faktori privlačenja uključuju atrakcije odredišta, kao što su smještaj, hrana i zabava.

Većina alata koji se koriste za mjerenje motivacije ispituju određene aspekte motivacije, a ne samo ukupnu motivaciju (Lee, Lee i Wicks, 2004). Tokom posljednja dva desetljeća, studije su otkrile niz važnih aspekta motivacijskih faktora turista i posjetilaca raznih festivalskih događaja (Uysal, Gahan, Martin 1993; Mohr, Backman, Gahan, Backman, 1993; Scott, 1996; Formica, Uysal, 1996; Formica, Uysal 1998; Schneider i Backman 1996; Crompton, McKay, 1997). Te studije ističu da sljedeće kategorije motivacije moraju biti uzete u obzir za razumijevanje ponašanja posjetilaca festivala: npr, bijeg, uzbuđenje, novitet (novost/regresija), socijalizacija/porodično zajedništvo (društvenost), uvažavanje prirode, znatiželja, kulturne/historijske, festivalska obilježja i postizanje ravnoteže.

Kim, Goh, i Juan (2010) navode da je općeprihvaćeno da je razumijevanje motivacije za putovanjem ključno u predviđanju budućih obrazaca putovanja. Prema istraživanju koje su proveli Park, Reisinger, te Kang (2008), razumijevanje

motivacije potrošača je ključni preduvjet za stvaranje željenih iskustava i zadovoljstva za kupce. Razumijevanje motivacije turista može doprinijeti ispunjavanju njihovih potreba kroz marketinške aktivnosti (Xie, Costa, i Morais, 2008). Fodness (1994) također navodi da je učinkovit marketing nemoguć bez imenovanja, razumijevanja i usklađivanja prioriteta motivacije potrošača. Povećanje interesa i veći angažman na festivalima je pridonio rastu festivala.

Festivali imaju utjecaj na kvalitet iskustva boravka kod turista u gradu gdje se održava festival. Pri posjeti organiziranom događaju, posjetitelji-turisti će osim osnovne potrošnje vjerojatno potrošiti svoj novac na smještaj, robu i uslugu, kao i posjetiti razne znamenitosti. Troškovi od strane turista, odnosno stečeni prihodi, mogu imati značajan utjecaj na lokalnu ekonomiju cirkulirajući kroz nju kao dohodak. Učinkovita promocija destinacije kroz organizirani događaj može rezultirati time da turisti - posjetitelji produže svoj boravak i posjete druge regionalne turističke destinacije i njihove atrakcije (Getz, 2008).

Grunwell, Ha, Martin (2008) ispitivali su ponašanje posjetilaca i njihovih obilježja na filmskom festivalu u Ashevilleu. Otkrili su da je ekonomski učinak po osobi na filmskom festivalu veći od posjetilaca regionalnog uličnog festivala koji se također održava u Ashevilleu, država Tennessee. Studija Evropske koordinacije filmskih festivala u 1999. godini također je pokazala da posjetioci filmskih festivala troše više novca po osobi od posjetilaca druge vrste festivala. Studija Europske koordinacije filmskih festivala pokazala je da posjetioci filmskih festivala imaju veći dohodak i viši nivo obrazovanja od posjetilaca druge vrste festivala.

Festivali utiču i na buduće namjere inostranih turista da ponovo posjete destinaciju i da posjetu destinaciji preporuče drugim ljudima. Festivali su također prepoznati kao jedan od najvažnijih područja turizma i doprinose svojim matičnim zajednicama na nekoliko načina: stvaranje ekonomskog učinka, povećanje cjelokupnog imidža destinacije, te potiču sudjelovanje u životu zajednice. Festivali također podižu prepoznatljivost odredišta. Prema Grunwell, Ha & Martin (2008), festivali bi mogli privući potpuno novu skupinu turista na odredište. Kada posjetitelji imaju pozitivno iskustvo u matičnom gradu, oni će se vratiti na to mjesto u budućnosti (Woosnam, McElroy i Winkle, 2009).

Yoon i Uysal (2005) predložili su model za prikazivanje idealnog procesa za postizanje odanosti odredištu. Model je temeljen na potrošačkoj motivaciji i pokazuje da bi poznavanje i razumijevanje motiva potrošača moglo u konačnici pomoći u postizanju destinacijske lojalnosti potrošača. To je festivalska lojalnost koju organizatori traže, jer stvara stalne posjetioce koji su od vitalnog značaja za

uspjeh bilo koje operacije (Petrick, 2004). Uobičajena poslovna strategija je odvajanje potencijalnih posjetilaca na segmente. Nakon što su posjetioci odvojeni, turistički proizvodi se mogu ponuditi svakom segmentu, pomoću specifičnog targetiranja. Poznavanje motivacije svakog segmenta pomaže festivalima u zadovoljavanju potreba svakog posjetioca pojedinačno, što će u konačnici dovesti to stalnih potrošača.

Imidž destinacije utiče na očekivano zadovoljstvo koje turista može da dobije u destinaciji, na sveukupnu evaluaciju puta prilikom povratka iz destinacije i na buduće namjere turista da ponovo posjete destinaciju ili da je usmeno promovišu (Crompton, Ankomah, 1993; Gartner, 1989; Godall, 1988). Samim tim, može se zaključiti da imidž neke destinacije pozitivno utiče na percepciju kvaliteta i ukupnog zadovoljstva destinacijom, dok će pozitivno iskustvo posjetilaca utjecati na poboljšanje imidža te destinacije (Chon, 1991; Echtner, Ritchie, 1991; Fakeye, Crompton, 1991; Ross, 1993).

Pored toga, ukupno zadovoljstvo putovanjem i pozitivno iskustvo u destinaciji doprinosi stvaranju lojalnih posjetilaca (Alexandris, Kouthouris, Meligdis, 2006; Bramwell, 1998; Oppermann, 2000; Pritchard, Howard, 1997). Nivo turističke lojalnosti nekoj destinaciji ogleda se u namjeri posjetilaca da ponovo posjete destinaciju i u njihovoj volji da tu destinaciju preporuče drugim potencijalnim turistima putem usmene propagande (Oppermann, 2000). Preporuka drugih posjetilaca koji već imaju iskustva vezano za neku destinaciju, može se uzeti kao najpouzdaniji izvor informacija za potencijalne turiste.

2. METODOLOGIJA I REZULTATI ISTRAŽIVANJA

U radu je primijenjen kvantitativni pristup istraživanju, koji je uključivao prikupljanje podataka putem anketiranja (*Face to Face* – licem u lice) ispitanika, uz korištenje anketnog upitnika, posebno kreiranog za ovo istraživanje.

Upitnik je struktuiran u pet sekcija: (1) sekcija koja sadrži pitanja vezana za demografsku strukturu posjetilaca, karakteristike njihovog boravka u Sarajevu i motivaciju za dolazak, (2) sekcija koja sadrži pitanja vezana za ocjenu pojedinih elemenata turističke ponude Sarajeva od strane inostranih turista (3) sekcija koja sadrži pitanja vezana za ocjenu pojedinih elemenata Sarajevo Film Festivala od strane inostranih turista, kao i ocjenu općeg imidža Sarajeva kao turističke destinacije, (4) sekcija koja sadrži pitanja koja se odnose na procjenu utjecaja boravka u Sarajevu na percepciju inostranih turista, (5) sekcija koja sadrži pitanja

koja se odnose na procjenu njihove lojalnosti (kroz spremnost za ponovni dolazak u Sarajevo i spremnost na preporučivanje posjete Sarajevu).

Prva sekcija uglavnom sadrži pitanja na koja su ispitanici odgovarali zaokruživanjem jednog od ponuđenih odgovora. Sve druge sekcije upitnika uglavnom sadrže pitanja na koja se odgovaralo korištenjem Likertove skale od jedan (1) do pet (5).

Populacija koja je obuhvaćena ovim istraživanjem su inostrani turisti (osobe koje nisu državljani BiH), a koji su posjetili Sarajevo u periodu održavanja Sarajevo Film Festivala (bez obzira da li je njihova posjeta uključivala posjetu dešavanjima na Sarajevo Film Festivalu ili ne), kao i u periodu od mjesec dana prije i poslije njegovog održavanja (juli i septembar 2014. godine).

Veličina uzorka za ovo istraživanje iznosila je 400 ispitanika (inostranih turista) odabranih metodom slučajnog uzorka – 200 inostranih turista koji su Sarajevo posjetili za vrijeme održavanja Sarajevo Film Festivala (15-23. avgust 2014. godine) i 200 koji su došli u periodu od mjesec dana prije i poslije njegovog održavanja (100 inostranih turista koji su ga posjetili u julu i 100 inostranih turista koji su ga posjetili u septembru 2014. godine). Za izbor ispitanika koristila se klasična metoda presretanja.

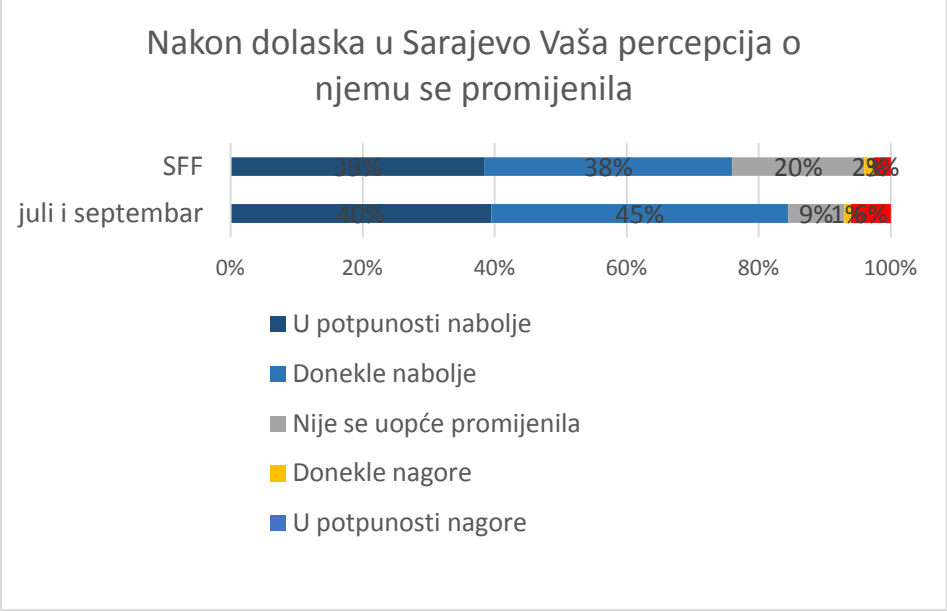
Nakon provedenog procesa anketiranja, podaci iz upitnika su unijeti u specijalno dizajniranu bazu u Excelu i onda eksportovani u Predictive Analytics SoftWare, verzija 18 (PAWS 18), bivši Softverski paket za društvena istraživanja (SPSS), u kojem je obavljeno njihovo čišćenje, te analiza.

Podaci dobiveni istraživanjem obrađivani su posebno za dvije ciljne grupe ispitanika tj. za (1) inostrane turiste koji su Sarajevo posjetili za vrijeme održavanja Sarajevo Film Festivala i za (2) inostrane turiste koji su Sarajevo posjetili u periodu od mjesec dana prije i poslije njegovog održavanja. Zatim je izvršeno poređenje ovih podataka i provedena analiza za svaku od navedenih grupa ispitanika.

Zbog postizanja naučne relevantnosti, pri analizi i interpretaciji dobivenih podataka korištene su deskriptivna statistika, testovi statističke značajnosti, korelaciona i regresijska analiza. Na taj način se provjerila validnost istraživačke i pomoćnih hipoteza.

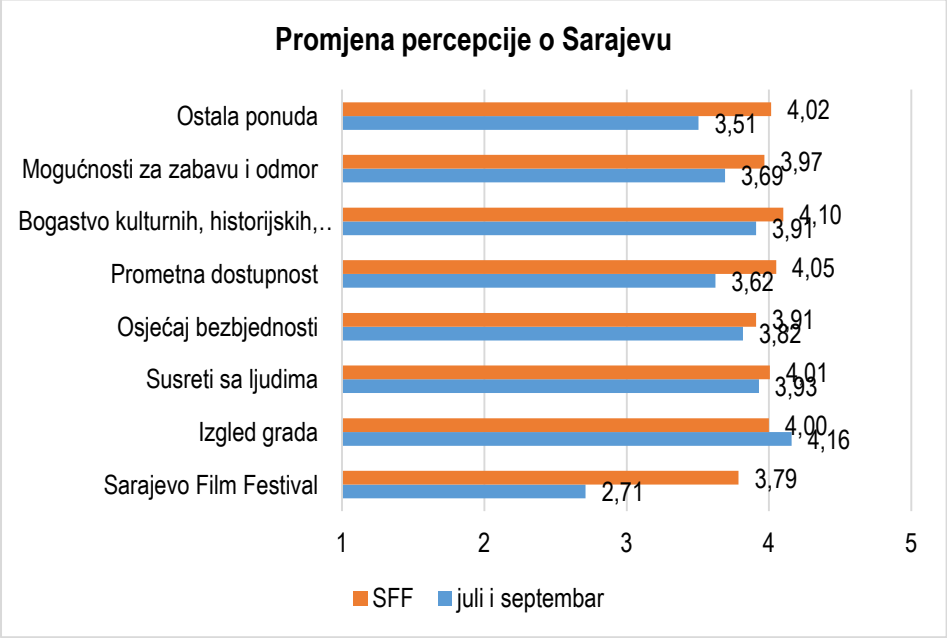
Rezultati istraživanja su pokazali da se nakon dolaska u Sarajevo, najvećem dijelu posjetilaca percepcija Sarajeva promijenila na bolje. Nešto je više onih kojima se percepcija promijenila u grupi koja je Sarajevo posjetila u toku jula i septembra.

Grafik 1: Promjena percepcije



Važno je istaći veliki udio, četiri od deset, onih kojima se percepcija promijenila u potpunosti na bolje (najpozitivnija promjena). To je slučaj kod obje grupe turista, skoro pa podjednako. Jako je mali broj onih koji su rekli da se percepcija promijenila na lošije. Kako bi se testiralo da li su ove razlike u proporcijama značajne, urađen je χ^2 test. Međutim, test je pokazao da ove razlike jesu statistički značajne, jer je p vrijednost χ^2 testa 0,008 što je niže od 0,05 i ukazuje na signifikantne razlike u proporcijama.

Grafik 2: Promjena percepcije o Sarajevu



Nakon pitanja o promjeni percepcije, turisti su označili koliko su ponuđeni elementi uticali da se percepcija promijeni. Kako se iz prethodnog grafika 2. vidi na turiste koji su u Sarajevu bili za vrijeme Sarajevo Film Festivala, a promjenili su percepciju o Sarajevu, najviše je uticalo bogatstvo kulturnih i drugih sadržaja, te prometna dostupnost.

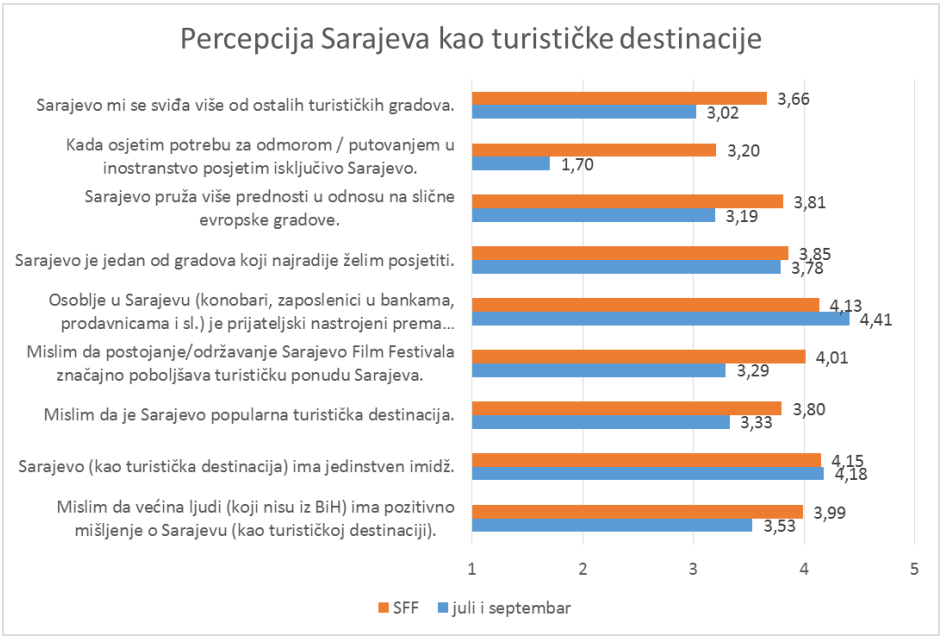
Tabela 1: Uticaj na promjenu percepcije Sarajeva

juli i septembar		SFF	
Izgled grada	4,16	Bogastvo kulturnih, historijskih, zdravstvenih i sportskih sadržaja	4,10
Susreti sa ljudima	3,93	Prometna dostupnost	4,05
Bogastvo kulturnih, historijskih, zdravstvenih i sportskih sadržaja	3,91	Ostala ponuda	4,02
Osjećaj bezbjednosti	3,82	Susreti sa ljudima	4,01
Mogućnosti za zabavu i odmor	3,69	Izgled grada	4,00
Prometna dostupnost	3,62	Mogućnosti za zabavu i odmor	3,97
Ostala ponuda	3,51	Osjećaj bezbjednosti	3,91
Sarajevo Film Festival	2,71	Sarajevo Film Festival	3,79

S druge strane, kod turista koji nisu bili u Sarajevu za vrijeme Sarajevo Film Festivala, izgled grada je najviše uticao na promjenu percepcije. Također, susreti sa ljudima i bogatstvo kulturnih i drugih sadržaja je snažno uticalo na promjenu percepcije. Ono što je zanimljivo, posebno kod grupe turista koji su boravili u Sarajevu za vrijeme Sarajevo Film Festivala je da je sam festival najmanje uticao na promjenu percepcije Sarajeva. U slučaju turista koji su bili u vrijeme kada se nije održavao festival, ovaj rezultat je očekivan, jer nisu imali iskustva sa festivalom. Međutim, kod posjetilaca koji su imali iskustvo sa festivalom je ovo važno detaljnije analizirati u budućnosti. Iako je ocjena od 3,79 blizu ocjene 4, koja znači da festival jeste uticao na promjenu percepcije (najčešće na bolje), ovu ocjenu treba posmatrati u kontekstu drugih elemenata koji su više uticali nego sam Sarajevo Film Festival.

Na kraju upitnika, testirani su stavovi koji se tiču Sarajeva kao turističke destinacije. Zanimljivo je razmotriti dobivene rezultate u grafiku ispod, te ih posmatrati poredeći ocjene turista koji su u Sarajevu boravili tokom i mimo Sarajevo Film Festivala.

Grafik 3: Percepcija Sarajeva kao turističke destinacije



Sada se ipak može primijetiti da je više tvrdnji sa kojima se slažu posjetioci u vrijeme festivala (sedam), nego onih s kojima se slažu posjetioci Sarajeva mimo festivala.

U ovom slučaju su ispod u tabeli izdvojeni elementi koji se statistički značajno razlikuju između ova dva uzorka. Podebljane su one tvrdnje s kojima se više slažu posjetioci za vrijeme Sarajevo Film Festivala, a u kurzivu napisane su tvrdnje s kojima se više slažu turisti anketirani u julu i septembru, a imaju statistički značajnu razliku između ova dva uzorka, ustanovljenu Mann Whitney U testom.

Tabela 2: Percepcija Sarajeva kao turističke destinacije i rezultati Mann Whitney U testa

	juli i septembar	SFF	P value
Mislim da većina ljudi (koji nisu iz BiH) ima pozitivno mišljenje o Sarajevu (kao turističkoj destinaciji).	3,53	3,99	0,000
Sarajevo (kao turistička destinacija) ima jedinstven imidž.	4,18	4,15	0,712
Mislim da je Sarajevo popularna turistička destinacija.	3,33	3,80	0,000
Mislim da postojanje/održavanje Sarajevo Film Festivala značajno poboljšava turističku ponudu Sarajeva.	3,29	4,01	0,000
Osoblje u Sarajevu (konobari, zaposlenici u bankama, prodavnicama i sl.) je prijateljski nastrojeni prema gostima.	4,41	4,13	0,002
Sarajevo je jedan od gradova koji najradije želim posjetiti.	3,78	3,85	0,771
Sarajevo pruža više prednosti u odnosu na slične evropske gradove.	3,19	3,81	0,000
Kada osjetim potrebu za odmorom / putovanjem u inostranstvo posjetim isključivo Sarajevo.	1,70	3,20	0,000
Sarajevo mi se sviđa više od ostalih turističkih gradova.	3,02	3,66	0,000

3. ANALIZA ISTRAŽIVAČKIH PITANJA

Turisti koji posjećuju Sarajevo tokom Sarajevo Film Festivala su mlađi nego turisti koji dolaze u neko drugo vrijeme, željni su zabave i pozitivno se izražavaju o opuštenoj atmosferi, zabavnim sadržajima u gradu, te programom i atmosferom na samom Festivalu. Njihova predodžba Sarajeva je donekle bila drugačija, ali ne tako različita kao kod „nefestivalskih" posjetilaca – ipak, su festivalski posjetioci nešto upoznatiji sa Sarajevom, jer su grad posjećivali više puta i postoji potencijal da ponovo dođu, ali i da budu ambasadori Sarajeva kroz preporuku drugima da posjete Sarajevo.

Svakako da vrijedi tretirati sve od ovih nalaza, kako bi se uvećao pozitivni efekat i upravljalo turističkim iskustvom u Sarajevu tokom, ali i mimo Sarajevo Film Festivala.

- Da li i na koji način Sarajevo Film Festival utiče na demografsku strukturu i karakteristike boravka inostranih turista u Sarajevu?

  Analize prvog dijela pitanja koje se odnose na demografsku strukturu posjetilaca su pokazale da postoji značajna razlika između posjetilaca tokom Sarajevo Film Festivala i u periodima prije i nakon festivala. Posjetioci tokom festivala su nešto mlađi, posjetili su Sarajevo više puta i češće imaju nedefinisano trajanje posjete.

  S druge strane, posjetioci koji su u Sarajevu bili u vrijeme kada nije trajao Sarajevo Film Festival su nešto stariji (ali i dalje je najdominantnija skupina stara između 24 i 39 godina), obrazovaniji i velika većina njih je u Sarajevu tek prvi put. Također, oni najčešće, sedam od deset ovih posjetilaca, borave u Sarajevu samo od jednog do tri dana.

  Posmatrajući ove informacije može se reći da Sarajevo Film Festival značajno utiče na demografsku strukturu inostranih posjetitelja Sarajeva, kao i na karakteristike njihovog boravka.

- Kakav je kvalitet iskustva inostranih turista u Sarajevu? Kakve su ocjene općeg imidža Sarajeva kao turističke destinacije i pojedinih elemenata turističke ponude Sarajeva od strane inostranih turista?

  Kvalitet iskustva, mjeren općim prosjekom mjerenja zadovoljstva ocjenama svih elemenata posjete, pokazuje da nema velike razlike među turistima za vrijeme i izvan održavanja festivala. Ipak, zadovoljstvo je blago veće kod turista u

„nefestivalsko“ vrijeme. Međutim, mnogo je važnije u ovom radu analizirati dimenzije zadovoljstva, odnosno razlike u zadovoljstvu pojedinim elementima posjete.

Vidljivo je da su turisti u vrijeme festivala zadovoljniji zabavnim sadržajima. S druge strane, posjetioci u julu i septembru su, između ostalog, zadovoljniji ljepotom prirode i kvalitetom smještaja.

Kada se na to doda i subjektivni osjećaj istraživača, ove ocjene su očekivane – u Sarajevu je mnogo zabavnih, koncertnih, filmskih i drugih događaja koji tokom Sarajevo Film Festivala turistima pružaju osjećaj i atmosferu provoda.

Ako se to analizira u kontekstu ranijeg pitanja, razlika između demografske strukture turista u vrijeme i mimo Sarajevo Film Festivala, dolazi se do toga da oba ova rezultata već daju veću sliku iskustva i atmosfere koja se nudi u Sarajevu za vrijeme i prije/nakon festivala. Mlađi posjetioci redovnije posjećuju Sarajevo, više zbog zabavnih sadržaja, a nešto stariji dolaze izvan festivala, te su zadovoljniji drugim sadržajima koje Sarajevo nudi.

- Da li je kod inostranih turista prisutna promjena u percepciji Sarajeva kao turističke destinacije nakon posjete Sarajevu, i ako da, u kom smislu? Da li i na koji način Sarajevo Film Festival utiče na promjenu ove percepcije?

  Promjena u percepciji, nakon dolaska u Sarajevo je zabilježena u velikoj mjeri. Najvećim dijelom se to odnosi na bolju percepciju grada nakon, nego prije posjete. Negativnih promjena je bilo u zanemarivom omjeru.

  Osim u apsolutnim omjerima, zanimljivo je bilo razmotriti promjenu percepcije Sarajeva između dvije različite skupine turista, prema terminu njihove posjete Sarajevu – u vrijeme i mimo Sarajevo Film Festivala. Turisti koji su Sarajevo posjetili za vrijeme festivala, su nešto manje promijenili percepciju o Sarajevu. Ipak, ta razlika nije statistički značajna. Ovaj rezultat treba pak posmatrati i u kontekstu ranije pomenutog nalaza da su turisti u vrijeme festivala češće turisti-povratnici, odnosno da su više puta bili u Sarajevu, te su već ranije imali izgrađenu percepciju Sarajeva.

  Na promjenu percepcije Sarajeva, posjetioci koji nisu bili u Sarajevu za vrijeme festivala, najviše su uticali izgled grada, susreti sa ljudima, te bogatstvo kulturnih, historijskih i drugih sadržaja. S druge strane, najveći uticaj da turisti u vrijeme Sarajevo Film Festivala promjene percepciju o Sarajevu su imali bogatstvo

kulturnih, historijskih i drugih sadržaja, prometna dostupnost i ostala ponuda. Kod obje grupe posjetilaca, najmanji uticaj je imao sam Sarajevo Film Festival.

- Da li i na koji način ocjena različitih aspekata Sarajevo Film Festivala utiče na ocjenu percepcije grada Sarajeva od strane inostranih turista?

  Kada se analiziraju različiti aspekti Sarajevo Film Festivala nalazi se da su inostrani turisti kod festivala najviše zadovoljni općim iskustvom na Sarajevo Film Festivalu, opuštenom atmosferom, te programom Sarajevo Film Festivala. Međutim, sama ova analiza ne govori puno, osim što se ima pregled koliko su kojim elementom turisti zadovoljni.

  Ono što je zanimljivije je posmatrati zadovoljstvo pojedinim elementima festivala među turistima koji su posjetili Sarajevo Film Festival prvi put i uporediti ih sa zadovoljstvom istim elementima među turistima koji su već ranije bili na Sarajevo Film Festivalu. Obje skupine su najviše zadovoljne općim iskustvom na Sarajevo Film Festivalu. Međutim, turisti koji su već bili na Sarajevo Film Festivalu su najviše zadovoljni, pored općeg iskustva, elementima koji se direktno tiču samog festivala (program, lokacije održavanja Sarajevo Film Festivala, usluga osoblja Sarajevo Film Festivala, te iskustvo sa rezervacijama).

  Turisti koji su na Sarajevo Film Festivalu prvi puta su, osim općeg iskustva, bili zadovoljni i opuštenom atmosferom, cijenom karata, programom i gostoprimstvom. Tu se vidi da su i dva elementa koja se direktno ne tiču Sarajevo Film Festivala (gostoprimstvo i opuštena atmosfera).

- Da li inostrani turisti imaju namjeru da ponovo posjete Sarajevo i da li imaju namjeru da posjetu Sarajevu preporuče drugim ljudima?

  Potencijal da se Sarajevo preporuči drugima i da se ponovo posjeti je značajan. Apsolutna i velika većina ima namjeru preporučiti dolazak u Sarajevo drugima. Približno jednak omjer je kod obje skupine ispitanika (u odnosu na termin posjete Sarajevu).

  Potencijal za ponovnu posjetu Sarajevu je nešto manji, ali ipak obje skupine (više od dvije trećine) su izrazile svoju namjeru da posjete Sarajevo. Međutim, ono što je važno istaći u ovom dijelu, je da ne postoji statistički značajna razlika između potencijala između ove dvije grupe turista. Potencijal i kod jednih i kod drugih je približno na istom nivou.

4. TESTIRANJE ISTRAŽIVAČKIH HIPOTEZA

Glavna hipoteza je glasila:
H1: Sarajevo Film Festival ima pozitivan utjecaj na percepciju inostranih turista o imidžu grada Sarajeva.

Glavna hipoteza se ne može prihvatiti, obzirom da su tri od četiri pomoćne hipoteze odbačene, možemo zaključiti da Sarajevo Film Festival nema pozitivan uticaj na percepciju inostranih turista o imidžu grada Sarajeva.

Međutim, to je potrebno posmatrati u kontekstu dobivenih nalaza i ne zaključivati direktno da Sarajevo Film Festival ne doprinosi turističkoj ponudi Sarajeva. Ovaj rad je doprinio da se bolje razumije vrsta iskustva u Sarajevu, koja se zaista razlikuje tokom i mimo održavanja Sarajevo Film Festivala.
Rad je pokazao da u Sarajevo tokom Sarajevo Film Festivala dolaze mlađi turisti, koji za razliku od drugih festivala i gradova imaju priliku osjetiti pozitivnu i opuštenu atmosferu, te učestvovati u brojnim zabavnim i festivalskim sadržajima, što su najbolje ocijenili prilikom evaluacije njihovog zadovoljstva.

Da bi se pozitivno iskustvo iskoristilo i aktiviralo posjetioce da budu ambasadori Sarajeva, potreban je aktivan rad sa posjetiocima od strane svih stakeholdera uključenih i u Sarajevo Film Film Festival i u turističku ponudu Sarajeva.

Osim toga, definirane su i sljedeće pomoćne hipoteze:

Pomoćna hipoteza 1: Sarajevo Film Festival značajno utiče na strukturu posjetilaca Sarajeva.

Posmatranjem rezultata i χ^2 test su pokazali da se turisti značajno razlikuju tokom i mimo trajanja Sarajevo Film Festivala. Razlike su dokazane χ^2 testom na varijablama koje predstavljaju dob (rezultat testa - 0.013) i nivo obrazovanja posjetilaca (0.000).
Udio mlađih posjetilaca je nešto viši tokom festivala, u odnosu na strukturu posjetilaca koji su Sarajevo posjetili u julu i septembru. Ovim podacima se prva pomoćna hipoteza prihvata.

Pomoćna hipoteza 2: Sarajevo Film Festival značajno utiče na kvalitet iskustva boravka u Sarajevu kod inostranih turista.

Testirajući varijable koje predstavljaju kvalitet boravka u Sarajevu tokom i prije/nakon Sarajevo Film Festivala, odnosno zadovoljstvo svim elementima kvalitete boravka, primijećene su značajne razlike. Primijenjen je Mann-Whitney U test, uzimajući u obzir vrstu podataka i ciljeve istraživanja. Test je pokazao da se značajno razlikuje zadovoljstvo na šest od 19 elemenata zadovoljstva boravkom. To su: osjećaj lične sigurnosti (rezultat testa značajnosti – 0.005), kvalitet smještaja (0.000), ljepota prirode i krajolika (0.004), zabava (0.005), raznovrsnost zdravstvenih sadržaja (0.005) i ispunjenost očekivanja posjetom (0.016).

Obzirom da se samo razlika značajno razlikuje na svega jednoj trećini elemenata, ne možemo prihvatiti ovu hipotezu, ali možemo djelomično iskoristiti ovaj nalaz za dobijanje kompletne slike o iskustvu turista u Sarajevu. Također, važno je napomenuti, da je zabilježeno veće zadovoljstvo na većem broju elemenata koji se razlikuju kod turista koji su boravili u Sarajevu u julu i septembru.

Pomoćna hipoteza 3: Posjeta Sarajevo Film Festivalu ima pozitivan utjecaj na buduće namjere inostranih turista da ponovo posjete Sarajevo.

Posjetioci Sarajeva su izrazili veliku spremnost da ponovo posjete Sarajevo, kako oni koji su boravili tokom, tako i prije/nakon festivala. Međutim, χ^2 test, koji je urađen da bi se provjerilo da li su proporcije odgovora o spremnosti da se ponovo posjeti Sarajevo značajno različite između turista za vrijeme i mimo Sarajevo Film Festivala, nije pokazao značajne razlike. Obje skupine su označile približno jednak nivo spremnosti da ponovo posjete Sarajevo (rezultat $\chi 2$ testa – 0.509).

Zbog toga se ova pomoćna hipoteza ne može prihvatiti, jer posjeta Sarajevu tokom festivala nije značajno uticala na veću spremnost turista da ponovo posjete Sarajevo. Međutim, Mann-Whitney U test (rezultat testa - 0.049) je pokazao da oni turisti koji su Sarajevo Film Festival posjetili više puta, spremniji da ponovo posjete Sarajevo.

Pomoćna hipoteza 4: Posjeta Sarajevo Film Festivalu ima pozitivan utjecaj na spremnost inostranih turista da posjetu Sarajevu preporuče drugim ljudima.

Slično kao i sa evaluacijom spremnosti i potencijala da se ponovo posjeti Sarajevo, spremnost turista da preporuče posjetu Sarajevu svojim prijateljima i rodbini je na visokom nivou. Međutim, nivo te spremnosti se ne razlikuje mnogo

između dvije različite grupe turista – onih koji su posjetili Sarajevo u vrijeme održavanja Sarajevo Film Festivala i onih koji nisu posjetili Sarajevo Film Festival.

Statistički χ^2 test (0.219) nije pokazao značajnu razliku između ova dva nivoa, što znači da posjeta Sarajevu u vrijeme održavanja festivala nije uticala da turisti pokažu veću spremnost da preporuče posjetu Sarajevu. Zbog toga se i ova pomoćna hipoteza odbacuje. Kao i u slučaju ponovne posjete, Mann-Whitney U test (rezultat testa - 0.022) je pokazao da turisti koji su Sarajevo Film Festival posjetili više puta, spremniji da posjetu Sarajevu preporuče drugim ljudima.

ZAKLJUČAK

Iako se hipoteza nije u potpunosti potvrdila, istraživanje u ovom radu ima višestruke koristi kako za turističku ponudu grada Sarajeva, tako i za Sarajevo Film Festival.

Prije svega treba krenuti od značajno različite strukture posjetilaca tokom i izvan vremena održavanja Sarajevo Film Festivala. Istraživanje je pokazalo da su posjetioci tokom Sarajevo Film Festivala značajno mlađi, a mimo Sarajevo Film Festivala stariji i obrazovaniji. Također, izvan festivala, posjetioci ostaju u Sarajevu kraće (do tri dana), a dolazak tokom festivala je duži i češće unaprijed nedefinirane dužine.

Kada se analizira kvalitet i zadovoljstvo pojedinim elementima posjete, odnosno turističkog iskustva, istraživanje je pokazalo da se zadovoljstvo značajno razlikuje. Posjetioci tokom festivala su zadovoljniji zabavnim sadržajima, a s druge strane su turisti mimo festivala zadovoljniji kulturnim i drugim sadržajima, prirodnim okruženjem i sl.

Već posmatrajući ova dva segmenta istraživanja vidi se da postoji različito iskustvo posjete, koje odgovara različitim profilima posjetilaca u dva različita vremenska perioda. Tokom festivala dolaze mlađi posjetioci, koji žele i dobivaju zabavu. U daljim segmentima, vrijedi istaći da se iskustvo značajno mijenja, kod svih grupa ispitanika, nakon što posjete Sarajevo. Promjena je u velikoj većini slučajeva bila pozitivna. Na tu promjenu, na posjetioce tokom festivala je najviše utjecalo bogatstvo kulturnih, historijskih i drugih događaja, a izgled grada kod posjetilaca mimo festivala.

Potencijal za preporuku i ponovnu posjetu Sarajevu postoji i to u velikoj mjeri. Međutim ne postoji velika razlika između ovog potencijala između posjetilaca tokom i mimo Sarajevo Film Festivala, pa se ne može reći da posjeta festivalu pravi značajnu razliku.

Kada bi se posmatrao cjelokupan istraživački projekat i izvlačili zaključci, to bi moglo da se predstavi u sljedećim tezama:

1. Sarajevo Film Festival nije tipičan filmski festival, već unikatna forma koja je organski izrasla u svojim godinama nastajanja.

   Ono što je marketinška implikacija ovoga, je da se dalji razvoj Sarajevo Film Festivala, odnosno razvoj i dizajn iskustva posjetilaca treba posmatrati kao unikatan projekat. Ovo nam govore nalazi istraživanja koji pokazuju da su posjetioci često zadovoljniji atmosferom, zabavom i elementima koji nisu direktno vezani za sam festival.

2. Iskustvo posjete Sarajevo Film Festivalu je neodvojivo od iskustva posjete gradu.

   Imidž grada i kvalitet posjete Sarajevo Film Festivalu se često miješaju i elementi kojima su ocjenjeni su kompatibilni. Posjetioci često ne razlikuju i ne odvajaju iskustva posjete gradu i posjete festivalu.

3. Zabava jeste dobar element festivala, ali ne treba zanemariti ostale elemente.

Ukupan nivo zadovoljstva je blago veći kod posjetilaca koji su u Sarajevu mimo festivala. Elementi kojima su posjetioci u to vrijeme najzadovoljniji su bogatstvo kulturnih, historijskih i drugih sadržaja.

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THE IMPACT OF A SPECIFIC EVENT ON THE PERCEPTION OF A TOURISM DESTINATION - THE CASE OF THE SARAJEVO FILM FESTIVAL

Abstract

The paper points to the underused possibilities of influence of the Sarajevo Film Festival, with aim of creating a positive tourist perception of the city of Sarajevo. This paper aims to determine how the Sarajevo Film Festival affects the tourist perception of the city of Sarajevo. One of the goals is to provide, on the basis of survey results, recommendations for a more efficient use of the Sarajevo Film Festival as a factor of event tourism in creating an authentic and recognizable tourist product of Sarajevo. The Sarajevo Film Festival is one of the most prominent film festivals in the Southeast Europe. It is held every year, since 1994 in Sarajevo, and has average visit of about 100,000 film fans. The research part of the paper analyzes the influence of the Sarajevo Film Festival on the motivation of foreign tourists to come to Sarajevo, the quality of experience of foreign tourists' stay in Sarajevo, their future plans to visit Sarajevo again and their willingness to recommend other people to visit Sarajevo. In this paper it was implemented quantitative approach to research, which included data collection through surveys (Face to Face) of respondents, with the use of questionnaires which were especially created for this study.

Key words: *event tourism, event industry, event management, tourism destination image, tourism destination perception*

PREGLEDNI NAUČNI RADOVI

REVIEW PAPERS

POVERTY AND INEQUALITY IN BOSNIA AND HERZEGOVINA: INCOME OR CONSUMPTION APPROACH – DOES IT MATTER?

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Abstract

Household Budget Surveys (HBS) are conducted in Bosnia and Herzegovina since 2004 and are still a basis for poverty assessment in the country. Household final consumption expenditure is a monetary measure used for the estimation of living standards and poverty in Bosnia and Herzegovina. Unlike Bosnia and Herzegovina, since 2003, European Union member states conduct Surveys on Income and Living Conditions (EU-SILC) and use it for poverty and living standards measurement on the basis of household income as a monetary measure.

HBS surveys were conducted in Bosnia and Herzegovina four times: in 2004, 2007, 2011 and 2015. This paper is based on HBS data from 2011 because data from 2015 are still not available for researchers. The aim of this paper is to determine differences in size, depth and severity of poverty, as well as in size of inequality in the country and its regions: Federation of Bosnia and Herzegovina, Republika Srpska and Brčko District, both by measuring poverty by using household consumption expenditure approach and by using household income approach.

In accordance with the requirements of Eurostat, data collection on household incomes was significantly improved in the Household Budget Survey conducted in 2011. Data collected within this survey were used in this paper to estimate the total household income in line with EU-SILC regulations and methodology. On the basis of these estimates, we will examine whether the existing measures of poverty and inequality in Bosnia and Herzegovina were underestimated. Considering that household consumption expenditure in Bosnia and Herzegovina is supported by remittances which are not registered, neither in bank transfers nor in Household Budget Survey, loans for consumption purposes and/or by informal incomes, we will test the assumption that household consumption expenditure is significantly higher than household income. Based on this fact, the question arises: is the measurement of poverty and inequality based on consumption expenditure an adequate approach?

In this study, for the purpose of comparison of poverty and inequality we will use indicators based on consumption and income approach. We will use Foster–Greer–Thorbecke poverty indices (headcount index, poverty gap index and poverty severity index) and Gini and Theil indices as inequality measures. We expect that poverty and inequality measures based on income will be higher in comparison to those based on consumption expenditure. It will be a clear sign that the poverty in Bosnia and Herzegovina is significantly underestimated due to inadequate monetary measure of wellbeing and that it is urgently needed to fully harmonize poverty assessment method to EU requirements and standards, i.e. to conduct full-scale EU-SILC.

Keywords: poverty, inequality, income, consumption expenditure

JEL classification: I131, I132

1. Introduction

The official statistical assessments of the poverty in Bosnia and Herzegovina were based on the consumption approach. It was the case of poverty analysis based on the LSMS-Living Standards Measurement Survey in 2001, as well as in all household budget surveys, which were conducted later. Although within these household budget surveys, data on incomes was collected, they were never used for poverty indices calculations. The main reasons for this practice, was the opinion that income data within household budget surveys were significantly underestimated in comparison to consumption data and that the consumption better fits the poverty in Bosnia and Herzegovina, as a country in transition. Income data was only poorly analyzed and compared to consumption expenditure data and above-mentioned conclusion was taken. It is worth noting that the income analysis was only done on raw data, i.e. income data was never edited nor imputed, as the consumption data did. The household budget survey methodology was significantly improved in last decade and the level of the harmonization to EU standards and best practices was increased, but never to the high level because income approach in measuring poverty was not applied. It has prevented comparisons of poverty with other EU and non-EU countries, which used income approach in assessing poverty.

In order to increase the level of harmonization of poverty and living standards statistics, it is very important to strictly apply the EU regulations, i.e. to use income as a monetary poverty indicator. Apart of this fact, there are also theoretical and methodological reasons for using of income instead or with consumption as a monetary poverty indicator. In that way, the poverty analysis becomes richer and multidimensional and could provide data users more detailed picture of the country in terms of poverty and living standards of its population. Especially, it is very important for government bodies, which are in charge for designing strategies and for the poverty reduction and social protection policies. They need to get a real picture of the poverty situation at state and entity levels. In the case that consumption based poverty indices were significantly lower compared to those based on income, one could conclude that data users were not provided with adequate poverty indicators and, consequently, all policies based on consumption as a monetary poverty indicator could be less efficient.

2. Literature review

Although income level poverty indicators remained the main paradigm for economic deprivation and poverty measurement in the majority of countries[1], much literature had been published in order to examine this practice. Many authors discussed wheather income or consumption is better monetary measure of well-being. By discussing this issue, authors put this topic in the relationship to the level of development of the country, as well as they examined the effect of the used measure of well-being on specific population subgroups (for ex. poor and rich households, families with children, single parents households, low-educated single mothers, disabled, elderly people, jobless households, etc) in order to define their corellation and to be able to select better welfare measure. Unlike the USA, EU member states and other developed countries, in developing and countries in transition, as Bosnia and Herzegovina is, consumption is better choice in measuring well-beeing.

Meyer and Sullivan (2003) explained the differences between developed and developing countries as well as conceptual and reporting issues, which justify the use of income and consumption approach, respectivelly. They used several data sources from the Consumer Expenditure Survey, the Panel Study of Income Dynamics and the March Current Population Survey in order to compare two main welfare measures. They focused on the analysis of percentile distributions of income and consumption as well as the comparisons of their values. They also analysed both welfare measure for several specific population subgroups (low-educated single mother, single mother with a high schol degree, elderly families and families with a head who is disabled) and recorded the observed disparities. They found out that consumption for people in the bottom part of the distribution greatly exceed reported income and provided evidence that household surveys have substantial under-reporting of key components of income.[2] Their conclusion is that „consumption does a better job of capturing well-being for disadvantaged families".[3] Authors favor the consumption approach in deciding benefit amounts for social benefit programs and in the evaluation of effectiveness of transfer programs and general trends in poverty and food spending. But, they also recomended the use of income as the main eligibility criteria for transfer programs because of its ease of reporting.

[1] See Meyer & Sullivan (2003). EU member states introduced EU-SILC in 2003 and it became the standard for living condition and poverty analysis.

[2] Meyer & Sullivan (2003).

[3] Meyer & Sullivan (2003)., p. 35.

Johnson et al. (2005) examined which measure of well-being, income or consumption, is appropriate to use as inequality measure over time. Authors compared Gini coefficient based on two source of data (Census and Consumer Expenditure microdata) and also examined distribution of income and consumption over different types of households. They concluded that, in many cases, it does make a difference which measure is used. Consequently, they suggested using both measures for each household to evaluate their well-being and resulting distribution of resources.
Slesnick (1993) compared income and consumption approaches in measuring poverty in the Postwar United States and found out that consumption based poverty indicators are substantially lower than those based on income. He recommended to focus attention on persons who need assistance the most and to use consumption- rather than income-based welfare measures in order to better identify these individuals.[4]

In more detail, the literature review has highlighted the following elements:
1) There are substantional differences in poverty rates based on income or consumption
2) Percentile distributions of income and consumption are also different, especially for specific population subgroups
3) The choice of monetary measure of poverty has an impact on effects of poverty reduction strategies
4) The choice of monetary measure of poverty depends of the level of development of the countryand much more.

This paper is a first step of a more comprehensive attempt aiming at analyzing different approaches to measuring poverty in Bosnia and Herzegovina and will be complemented with quantitative analyses of several standardized poverty and inequality indicators and their relationship.

3. Monetary measures of well-being

Poverty is usually understood as a concept of income poverty i.e. lack of monetary capacities to meet basic needs. This concept is based on income or consumption expenditure as monetary measures of well-being or monetary poverty indicators. The most of surveys of income or consumption expenditure consider households as observational units. Both indicators are usually measured in relation to the household size. If household size is used as a number of household members, one has to assume that all household members

[4] Slesnik (1993), p.34.

have the same income contribution or the same needs, although that is not the case. In order to overcome this problem, scales of equivalence are used. The most commonly used scale of equivalence is OECD and modified OECD scale. OECD scale is defined by:

(1) $N' = 1 + 0,7 \cdot (N_{adults} - 1) + 0,5 \cdot N_{children}$,

where:
N' – equivalised household size,
N_{adults} – the number of adults and
$N_{children}$– the number of children in household.

In practice, the most widely used scale of equivalence is the modified OECD scale, defined by:

(2) $N'' = 1 + 0,5 \cdot (N_{adults} - 1) + 0,3 \cdot N_{children}$.

Although income and consumption expenditure are natural well-being measures, they are not easily measurable. Generally adopted definition of income is the Haig-Simons definition:

(3) *Income = consumption + change in net worth.*

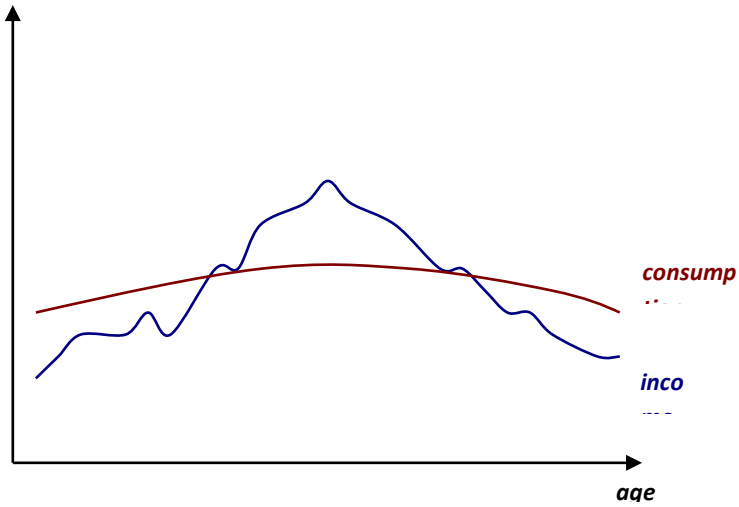
Intuitively, income represents the sum of incomes of all household members, but it includes a numerous amounts such as rents, dividends, informal transfers (family, friends), social transfers, subventions, loans etc. According to the Haig-Simons definition, it also includes changes in value of capital that is a part of total assets of households. Income measurement can be limited by the existence of grey economy and inefficient tax legislation. Besides that, people don't record income for a long period and there is possibility of hiding income due to avoid taxes or illegal sources of income.
Household consumption expenditure is defined as the value of goods and services purchased or self-produced in a certain period of time. Due to measure of consumption expenditure, it is needed to identify all components that are included in total household consumption. If consumption expenditure is used for poverty measurement, some components can be omitted. In certain cases, it is sufficient to include expenditure that is related to food and basic existential needs. On the other hand, even the poorest households have expenditure related to housing, clothes and toiletries.

Aiming to decide which monetary indicator will be used, it is needed to perceive their advantages and disadvantages. Usually, income is used in developed and consumption expenditure in developing countries.

The advantage of income is significantly smaller number of components, comparing to consumption expenditure. Also, decision on expenditure is individually based. Low consumption doesn't necessarily mean low living standard. On the other hand, income can be underestimated and affected by short-term changes (seasonal fluctuations).

Consumption reflects current living standard and people are more willing to provide information on expenditure than income. However, poor households can have higher consumption than their total income (debts, social networks). Consumption is much more stable in one life cycle. A typical relationship between consumption and income is presented on Figure 1.

Figure 1**. Life cycle: Consumption and income**[5]



4. Foster – Greer – Thorbecke poverty indices

Foster, Greer and Thorbecke (1984) defined new class of poverty indices. The best known and the most commonly used are headcount ratio, poverty gap index and poverty severity index.

[5] Source: Introduction to Poverty analysis, World Bank Document, p. 18.

4.1. Headcount ratio

The most commonly used poverty measure is headcount ratio P_0 (or incidence of poverty or poverty rate). For predefined poverty threshold z, headcount ratio is proportion of population units whose income[6] is not higher than z.

In the other words, headcount ratio represents proportion of poor units in population. It can be calculated by using the formula:

(4) $P_0 = \frac{1}{n}\sum_{i=1}^{n} I_i$,

where

n is population size;

I is indicator function of poverty, $I_i = \begin{cases} 1, & y_i \le z \ (i-th\ unit\ is\ poor) \\ 0, & y_i > z \ (i-th\ unit\ is\ not\ poor) \end{cases}$;

y_i is income of i-th population unit.

Formula (4) can be simplified as following:

(5) $P_0 = \frac{n_s}{n}$,

where n_s is the number of population units classified as poor.

The values of headcount ratio belong to interval $[0,1]$. It will be equal to 0 if there are not poor units in population (n_s=0) and equal to 1 if all population units are considered as poor (n_s=n). Although headcount ratio is simple to calculate and interpret, it has some serious disadvantages. In comparison of two populations or the same population in different time periods, it can indicate the same level of poverty although one population is in state of more serious poverty than the other. Also, it doesn't consider depth of poverty. Any population unit, which is below the poverty threshold, is treated in the same way. Any change below poverty line, e.g. falling into deeper poverty, doesn't affect headcount ratio.

Headcount ratio can be impractical and misused in evaluation of social policies and strategies. If strategies and reducing poverty measures treat only poor unit on the top of distribution of poor units (that are close to poverty thresholds), more

[6] We will keep income as poverty indicator, although all indices can be calculated for any quantitative poverty indicator.

units will come out of poverty. In that case, headcount ratio will indicate better results in reducing poverty than in the case that strategies and measures treat the most vulnerable units, on the bottom of income distribution.

4.2. Poverty gap index

Poverty gap index P_1 is defined on the basis of adjusted vector (adjusted distribution) of income y. If $Y=(y_1,y_2,...,y_n)$ represents vector of income, defined on population, than adjusted vector $Y^*=(y_1^*,y_2^*,...,y_n^*)$ is defined by:

$$(6)\ y_i^*=\begin{cases} y_i, & for\ y_i\le z \\ z, & for\ y_i>z \end{cases}.$$

In the other words, adjusted vector of income is obtained by vector of income by replacing incomes of nonpoor population units with the amount of poverty threshold. We will assume that vector Y, and therefore vector Y^*, is arranged in non-decreasing order.

Normalized income deficit, for i-th population unit is defined by:

$$(7)\ PG_i=\frac{z-y_i^*}{z},\ i=1,2,...,n$$

For nonpoor population units, normalized income deficit is equal to zero: $PG_i=0\ \ (i=n_s+1,n_s+2,...,n)$.

Poverty gap index is constructed as the average normalized income deficit, based on adjusted income distribution:

$$(8)\ P_1=\frac{1}{n}\sum_{i=1}^{n}PG_i=\frac{1}{n}\sum_{i=1}^{n}\frac{z-y_i^*}{z}.$$

Based on (7):

$$(9)\ \sum_{i=1}^{n}\frac{z-y_i^*}{z}=\sum_{i=1}^{n_s}\frac{z-y_i}{z}.$$

Considering last equation, poverty gap index can be expressed as following:

$$(10)\ P_1 = \frac{1}{n}\sum_{i=1}^{n}\frac{z - y_i^*}{z} = \frac{1}{n}\sum_{i=1}^{n_s}\frac{z - y_i}{z}.$$

If μ^* is average income of adjusted income distribution, poverty gap index is equal to:

$$(11)\ P_1 = \frac{z - \mu^*}{z}.$$

On the other hand, by using indicator function of poverty, poverty gap index can also be expressed by formula:

$$(12)\ P_1 = \frac{1}{n}\sum_{i=1}^{n}\frac{z - y_i}{z}\cdot I_i.$$

Like headcount ratio, values of poverty gap index belong to interval $[0,1]$. It will be equal to 0 if there are not poor unit in population and equal to 1 if all population units are poor with income of 0 (without incomes).
Poverty gap index considers the depth of poverty i.e. the distance of poverty threshold, so it removes disadvantage of headcount ratio. Each monetary unit directed as social transfer below poverty line, regardless of position of population unit, will decrease total deficit for the same amount 1/*z*. In that case, policy creators are not stimulated to intervene at the top of income distribution of poor units.

4.3. Poverty severity index

Poverty severity index - P_2 is defined as the average squared normalized deficit of adjusted income distribution:

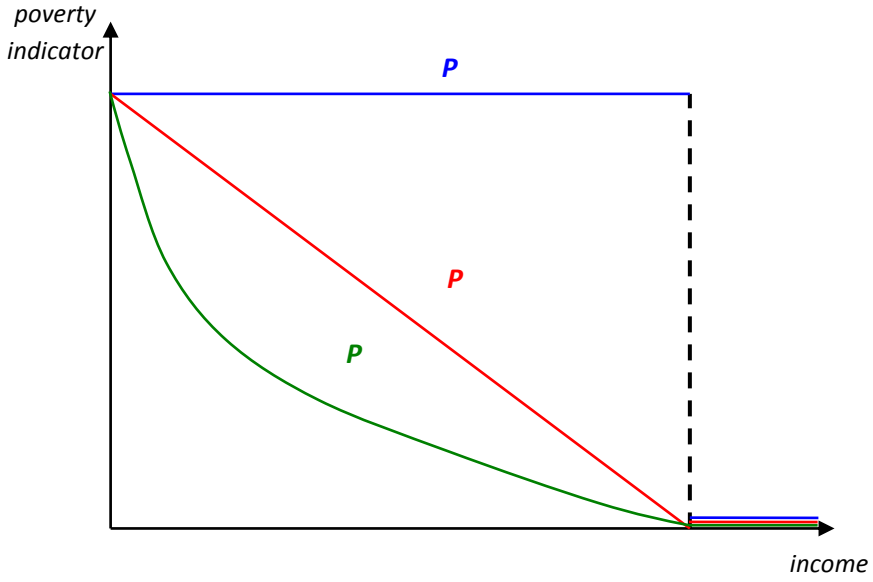
$$(13)\ P_2 = \frac{1}{n}\sum_{i=1}^{n} PG_i^2 = \frac{1}{n}\sum_{i=1}^{n}\left(\frac{z - y_i^*}{z}\right)^2$$

The values of poverty severity index also belong to interval $[0,1]$ with the value of 0 if there are not poor population units and value of 1 if all population units are

poor with income of 0. Poverty severity index can be understood as weighted poverty gap index, where each normalized income deficit is weighted by itself. Proportionally higher weights are assigned to the units with the higher deficit of income. In that way, units at the bottom of income distribution have higher significance. Therefore, unlike headcount ratio and poverty gap index, poverty severity index takes care of income distribution among poor population units. The usage of this index will stimulate policy creators to direct budget at the bottom of distribution first.

Figure 2 represents the relationship among values of headcount ratio, poverty gap index and poverty severity index.

Figure 2. P_0, P_1 i P_2[7]



4.4. Foster – Greer – Thorbecke's class of unidimensional poverty indices

Headcount ratio, poverty gap index and poverty severity index belong to the class of indices defined by Foster, Greer and Thorbecke (1984):

$$(14)\quad P_\alpha = \frac{1}{n}\sum_{i=1}^{n} PG_i^\alpha = \frac{1}{n}\sum_{i=1}^{n}\left(\frac{z - y_i^*}{z}\right)^\alpha,\ \alpha \geq 0.$$

[7] Source: Ravallion, M., Poverty Comparisons, p. 41.

Coefficient $\alpha \geq 0$ represents the measure of sensibility to poverty. If α increases, then also increases significance (weight) which is assigned to units at the bottom of income distribution.

For $\alpha = 0$, formula (14) represents headcount ratio, for $\alpha = 1$ it is poverty gap index and for $\alpha = 2$ poverty severity index.

Values of all indices from the class of Foster – Greer – Thorbecke indices belong to interval $[0,1]$, where 0 represents case of population without poor units, and 1 case of population in which all units are poor with income of 0.

5. Gini coefficient

Gini coefficient is the most commonly used inequality measure. It is defined based on the Lorenz curve as the share of concentration area compared to maximum concentration area.[8] Let *L*=*L*(*r*) be Lorenz curve of income distribution *Y*, where *r* is cumulative share of population units. Then, Gini coefficient is equal to:

$$(15)\quad G = 2P = 1 - 2 \cdot \int_0^1 L(r)dr \,.$$

In practice, there are more equivalent formulas to calculate Gini coefficient. Suppose that population incomes are arranged in non-decreasing order. The most common method for calculation of Gini coefficient is *trapezium rule*:

$$(16)\quad G = 1 - \frac{1}{n}\sum_{i=1}^{n}\left(Q_i + Q_{i-1}\right),$$

where Q_i represents cumulative income for the first *i* population units. Gini coefficient can be calculated directly by income: [9]

[8] Triangle on Lorenz curve graph, below the total equality line.
[9] Šošić, I., Primijenjena statistika, p. 125.

$$(17)\quad G=\frac{2\sum_{i=1}^{n} iy_i-(n+1)\sum_{i=1}^{n} y_i}{n\sum_{i=1}^{n} y_i}.$$

There are some other equivalent formulas for calculation of Gini coefficient directly by income:[10]

$$G=\frac{1}{2n^2\mu}\sum_{i=1}^{n}\sum_{j=1}^{i}\left|y_i-y_j\right|=$$

$$(18)\quad =1-\frac{1}{n^2\mu}\sum_{i=1}^{n}\sum_{j=1}^{i}\min(y_1,y_j)=$$

$$=1+\frac{1}{n}-\left(\frac{2}{n^2\mu}\right)\left(y_1+2y_2+\ldots+ny_n\right)$$

In case of sample with defined weights for sample units, expression for calculation of Gini coefficient is:[11]

$$(19)\quad G=\left(\frac{2\cdot\sum_{i=1}^{n'}\left(w_i\cdot y_i\cdot\sum_{j=1}^{i} w_j\right)-\sum_{i=1}^{n'} w_i^2\cdot y_i}{\sum_{i=1}^{n'} w_i\cdot\sum_{i=1}^{n'} w_i\cdot y_i}-1\right)\cdot 100,$$

where *n*' is sample size.

The values of Gini coefficient belong to interval $[0,1]$ where 0 represents total equality and 1 represents total inequality. The main disadvantage of Gini coefficient is lack of decomposability on population subgroups. Also, it is not possible to distinct different inequality types by using Gini coefficient. There are cases in which Lorenz curves intersect, indicating different patterns of income distributions but Gini coefficients have close values.

[10] Unidimensional Inequality Measurement (On line materials), OPHI

[11] Hulliger et al, Robust Methodology for Laeken Indicators, European Comission, str. 19.

6. Generalized measures of entropy

This class of inequality measures is based on entropy concept. In thermodynamics, entropy is a measure of chaos and in informatics, a measure of uncertainty. If applied on income distribution, entropy represents deviation from total equality. Generalized measures of entropy are defined by:

$$(20)\quad GE(\alpha)=\begin{cases}\dfrac{1}{n}\sum_{i=1}^{n}\ln\left(\dfrac{\mu}{y_i}\right)=\dfrac{1}{n}\sum_{i=1}^{n}\left(\ln\mu-\ln y_i\right), & \alpha=0\\ \dfrac{1}{n}\sum_{i=1}^{n}\dfrac{y_i}{\mu}\ln\left(\dfrac{y_i}{\mu}\right), & \alpha=1\\ \dfrac{1}{\alpha(\alpha-1)}\left[\dfrac{1}{n}\sum_{i=1}^{n}\left(\dfrac{y_i}{\mu}\right)^{\alpha}-1\right], & \alpha\neq 0,1\end{cases}$$

Depending on value of α, different measures of entropy are obtained. Positive values of α set sensibility focus of entropy measures to the certain part of income distribution. For large positive α, *GE* index will be more sensitive to inequality at the top of income distribution. Small positive α replaces sensibility focus at the bottom of income distribution.

Although $\alpha\in(-\infty,\infty)$, in practical uses are present only nonnegative α, considering that for negative α, measures of entropy (20) are not defined for incomes of 0. The most commonly used measures of entropy are obtained for $\alpha=0,1 \text{ and } 2$. Generalized entropy measure obtained for $\alpha=0$ is ***mean log deviation***. The most known and widely used is ***Theil index***, obtained for $\alpha=1$. Mean log deviation and Theil index have common disadvantage – they are not defined for incomes of 0. In practice, incomes of 0 can be replaced with incomes of small positive values. Their minimum of mean log deviation and Theil index is equal to 0, in the case of total equality, and maximum cannot be directly determined. In the case of total inequality, all incomes, except one,[12] are equal to 0 and replaced with the incomes of small positive value. Then, maximal value of Theil index tends to $\ln n$ and maximal value of mean log deviation cannot be determined. All other measures from the class of generalized measures of

[12] Which is different from 0, in the case of total inequality.

entropy have the minimal value 0 (total equality) and maximal value $\frac{n^{\alpha}-n}{n\alpha(\alpha-1)}$ (total inequality).

Aiming to improve interpretability, these indices can be normalized to interval $[0,1]$ and defined as *relative generalized measures of entropy*.
For $\alpha=1$, *relative Theil index* is defined by:

(21) $$RGE(1)=\frac{1}{n\ln n}\sum_{i=1}^{n}\frac{y_i}{\mu}\ln\left(\frac{y_i}{\mu}\right).$$

For $\alpha\neq 0,1$, relative generalized measures of entropy are defined by:

(22)
$$RGE(\alpha)=\frac{\frac{1}{\alpha(\alpha-1)}\left[\frac{1}{n}\sum_{i=1}^{n}\left(\frac{y_i}{\mu}\right)^{\alpha}-1\right]}{\frac{n^{\alpha}-n}{n\alpha(\alpha-1)}}=\frac{1}{n^{\alpha}-n}\left[\sum_{i=1}^{n}\left(\frac{y_i}{\mu}\right)^{\alpha}-1\right],\quad \alpha\neq 0,1.$$

Due to absence of maximal value in case of $\alpha=0$, relative generalized measure of entropy is not defined.

All relative generalized measures of entropy are equal to 0 in the case of total equality and equal to 1 in the case of total inequality.

7. Poverty and inequality measures based on income and consumption

As a source of data, this study utilizes the most recent available datasets from Household Budget Survey 2011. Datasets contain data collected on the sample of 7400 households. Monetary poverty indicators used for construction and calculation of poverty and inequality indices are equivalised[13] monthly household's consumption expenditure and equivalised monthly household's income. For both indicators relative poverty thresholds calculated as 60% of

[13] Household monthly consumption expenditure and household monthly income are divided by adjusted household size, obtained by using modified OECD scale.

median for consumption expenditure or income are used. Poverty threshold based on equivalised monthly household's consumption expenditure amounts 416.40 BAM, while poverty threshold based on equivalised monthly household's income amounts 217.25 BAM.

In case of households' incomes, there were 489 households with the incomes of 0. The reason for such data was inadequately prepared datasets: checking and imputation of missing incomes were not performed. We have noted that there were households that have recorded the existence of certain income components but still had income of 0. The share of these households is about 55% of the households with zero income. Still, we decided to exclude households with zero incomes from the analysis based on income as poverty indicator. Excluding of households with the income of 0 from the sample was the reason why we can conclude that indices based on income will be underestimated.

In case of households' consumption expenditures, all 7400 household were included.

The average and median of household's consumption expenditure and income were calculated for both samples (Table 1.).

Table 1. Mean and median of household's consumption expenditure and income (2 samples)

	Sample 1 (7400 households)		**Sample 2 (6911 households)**	
	Consumption	**Income**	**Consumption**	**Income**
Mean	822,78	444,22	817,01	475,55
Median	694,00	337,33	688,78	362,08

The mean and median for consumption are significantly higher in both samples. These results led to reasonability of comparisons of indices based on households' consumption expenditures and households' incomes.

7.1. Foster – Greer – Thorbecke poverty indices

Based on formulas (5), (10) and (13), Foster – Greer – Thorbecke poverty indices: headcount ratio, poverty gap index and poverty severity index, were constructed for entire Bosnia and Herzegovina and separately for Federation of Bosnia and Herzegovina, Republika Srpska and Brčko District. All indices were

calculated based on households' consumption expenditures and households' incomes as poverty indicators.
The results are presented in the Table 2.

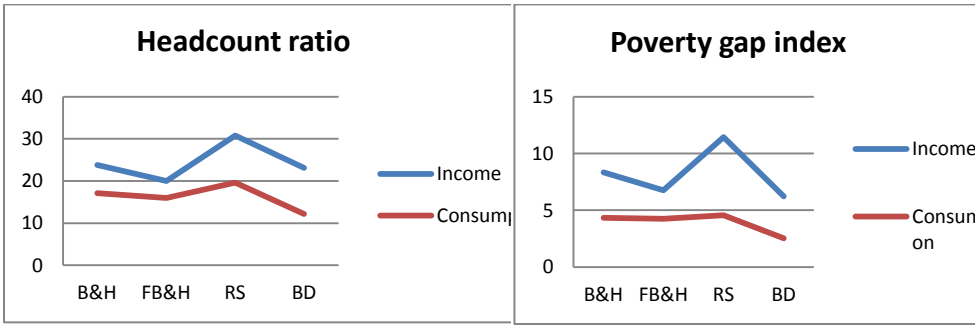
Table 2. FGT indices based on consumption and income (B&H, FB&H, RS and BD, HBS 2011)

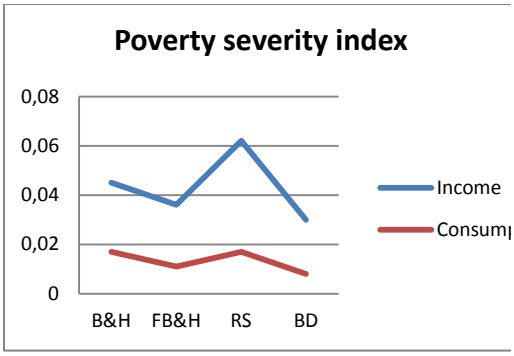
	Headcount ratio (P_0)		Poverty gap index (P_1)		Poverty severity index (P_2)	
	Income	Consumption	Income	Consumption	Income	Consumption
B&H	0,238	0,171	0,083	0,043	0,045	0,017
FB&H	0,200	0,160	0,067	0,042	0,036	0,011
RS	0,308	0,196	0,114	0,045	0,062	0,017
BD	0,231	0,122	0,062	0,025	0,030	0,008

As expected, all poverty measures based on income are higher than corresponding poverty measures based on consumption. Especially in case of poverty rate (headcount index), for Republika Srpska and Brčko District, the percentages of poor households are more than 10 percentage points higher if measured by income. For these regions, depth of poverty is more than double higher in case of income as poverty indicator. Also, for all regions, severity of poverty is more than triple higher if measured by income.

Graphical presentation of differences between two approaches to poverty measurement is given on Figure 1.

Figure 1. Graphical presentation of FGT indices based on consumption and income





Based on Table 2. and Figure 1. we concluded that incidence, depth and severity of income poverty in Bosnia and Herzegovina and its parts are significantly higher than consumption poverty.

7.2. Inequality measures

Based on household's consumption expenditures and income distributions, we calculated Gini coefficients and Theil indices for Bosnia and Herzegovina, Federation of Bosnia and Herzegovina, Republika Srpska and Brčko District. The results are given in the Table 3.

Table 3. Gini coefficients and Theil indices for B&H, FB&H, RS and BD (2011)

	Gini coefficient (%)		Theil index	
	Income	Consumption	Income	Consumption
B&H	39,74	31,19	0,2725	0,1640
FB&H	38,87	31,76	0,2565	0,1685
RS	40,83	28,42	0,2974	0,1471
BD	33,30	29,16	0,1956	0,1443

Inequality indices, calculated on the basis of distributions of households' consumption expenditures and households' incomes, indicate higher level of inequality in all areas in case of income distribution. Gini coefficients for Republika Srpska and Brčko District are more than 10 percentage points higher for income distribution, compared to consumption distribution. Theil indices show exactly the same relationships between levels of consumption inequality and income inequality. In the case of Republika Srpska, Theil index of income distribution is more than double higher than the same measure in the case of consumption distribution.

Also, official reports indicate the highest level of inequality in Federation of Bosnia and Herzegovina. On the other side, obtained income inequality indices indicate the highest level of inequality in Republika Srpska, in the case of both indices, Gini or Theil.

All obtained differences in poverty and inequality indices can be considered as a proof that poverty and inequality shouldn't be measured exclusively on the basis of consumption expenditure.

8. Conclusion

Although data on households incomes were collected in Household Budget Surveys in Bosnia and Herzegovina, official statistical assessments of poverty are still based exclusively on household's consumption expenditure as a measure of material well-being . Considering that the income measurement is significantly improved in the last wave of HBS, it is important to investigate whether poverty and inequality measures indicate similar conclusions. The importance of income poverty and inequality is particularly emphasized in order to harmonize living standard statistics to EU regulations and best practices and to achieve international comparability of results. Additionally, data users, especially government bodies which are in charge for economic and social policies, must be provided with adequate measures of well-being.

The aim of this study is to present methodology of construction of main poverty and inequality indices and to compare results of their applications on consumption and income data. Based on data from HBS 2011, we calculated Foster-Greer-Thorbecke poverty indices: headcount ratio, poverty gap index and poverty severity index, and also Gini coefficient and Theil index as the inequality measures. In case of consumption expenditure, we used the sample consisted of 7400 households while in case of income, sample was restricted to 6911 households. The main reason for this restriction is vagueness in the case of households with zero incomes. It was not undoubtedly clear whether those households had zero incomes or incomes were not reported. Although we were aware of this lack, we believe that results based on restricted sample satisfactorily indicate the main direction of relationship between poverty and inequality measures based on income or consumption.

Based on calculated Foster – Greer – Thorbecke poverty indices, we concluded that there were differences in incidence, depth and severity of poverty in Bosnia

and Herzegovina, Federation of Bosnia and Herzegovina, Republika Srpska and Brčko District. All poverty indices, in all areas, were higher in the case of income as poverty indicator. This result led us to conclusion that state of poverty in country is underestimated if measured by consumption expenditure.

Similarly, calculated inequality measures indicate the greater income inequality level in all areas, in certain cases for more than 10 percentage points. Also, the relationship between inequality levels in two entities: FB&H and RS, had the opposite direction if inequality is measured based on income or consumption distribution.

Considering these conclusions, to achieve more efficient poverty and inequality assessments in Bosnia and Herzegovina, it is needed to improve the analysis of income data, which are collected in Household Budget Survey in the sense that appropriate procedures of data editing and imputations must be applied within data validation process. In this way it is possible to get complete income variables ready for the analysis and to produce both, income and consumption poverty indicators. Besides that, Household Budget Survey could be used as an unique data source for consumption and income variables and to enable the comparison of aggregate income and consumption data for main domains of the analysis. Fully harmonization of the living standards statistics with EU regulations and best practices requires the introduction of EU-SILC survey as a source of income data and a basis for poverty analysis. Once the EU-SILC was introduced, it should be continuously conducted, while Household Budget Survey could be conducted less frequently (for ex. every five years). The optimal combination of EU-SILC and Household Budget Survey should be the goal of statistical institutions in Bosnia and Herzegovina in coming years.

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MODERNISATION OF BUSINESS STATISTICS: CHALLENGES AND OUTCOMES OF THE SLOVENIAN STATISTICAL OFFICE

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Abstract

Business statistics are facing major challenges: the world economy has become global, more integrated. Development and growing importance of the service sector in recent years have led to increasing demands and needs for a separate and broader monitoring of services. At the same time there is strong pressure to cut red tape and reduce the burden on enterprises.

For business statistics to continue to be relevant to users, to also balance the needs for information between traditional statistical areas and the areas of emerging economic phenomena and at the same time reduce the burden on enterprises, it was necessary to begin to invest in an integrated approach and renovation. At the European level a special project was launched aimed to integrate the existing domain-specific regulations in business statistics by establishing a cross-cutting legal framework. At the national level these resulted in modification and modernisation of the current statistical methodology and processes as well as in the development of missing economic indicators in the field of business statistics.

The Slovenian statistical office responded to the challenges in different ways by adequately reflecting these new phenomena and requirements. The article illustrates the challenges we have been facing on this path, some results and solutions, which are already available and have recently been implemented in practice.

One of the main engagements done in recent years was to strengthen the role of the business register at the national level by setting up the new Statistical Business Register (SBR). Other important tasks were the development of new economic indicators, modernisation of data collection and the rationalisation of the statistical processes. In the context of monitoring the phenomenon of globalization, we started with the investigation of profiling. Also connected with profiling was another technical challenge, i.e. setting up a new enterprise group register and establishing connections and data exchange with the EuroGroup Register.

Although the modernisation of Slovenian business statistics started several years ago, some important and complex challenges are still in front of us.

Keywords*: business statistics, modernisation, globalisation, register, enterprise*

JEL classification*: M*

1. Introduction

In recent years, many fields of statistics, including business statistics, have been facing a strong need for reorganization and modernization to make them more efficient and flexible in order to quickly respond the ever growing needs of different users for new data, to monitor new phenomena and at the same time reduce the costs and burden for national statistical offices and enterprises arising from data reporting.

The Slovenian statistical office (SURS) has strived to respond to all these challenges and new requirements. One of the main engagements done in recent years was to strengthen the role of the business register at the national level and establish data exchange with the EuroGroup Register (EGR) also through a new Enterprise Group Register (EnGR). Other important challenges were the development of new economic indicators, modernisation and rationalisation of the statistical processes, using new data sources and in the context of monitoring the phenomenon of globalization, the investigation of profiling.

The article illustrates the challenges we have been facing on this path, some results and solutions that are already available and have recently been implemented in practice as well as some plans for the future.

2. Statistical registers

2.1. New Statistical Business Register – the backbone of business statistics

The Statistical Business Register (SBR) plays the central role in business statistics both in terms of how to prepare individual statistics as well as in terms of content and quality. The register is a database of all business entities and links between them and also serves as a framework for the selection of observation units, the implementation of business demography, etc.

From the point of modernisation of business statistics, the main objective at the national level was to strengthen the role of the business register as a key infrastructure element from which it is expected to draw all the necessary information on the business sector to meet the needs of business statistics and at the European level to support the EGR and other needs.

SURS set up the first SBR already in 2004 as a combination of administrative and statistical sources. Over the years, it has shown the need to upgrade and improve it. The users needed more up-to-date information on business population, more reliable information on the main activity code, complete coverage of local units, timely monitoring of demographic events and insolvency proceedings, following the continuity of units, etc. On the other hand, new data sources appeared and became available for statistical purposes. There were also new EU recommendations for keeping registers and statistical experiences on setting up more standardised and centralised technical solutions.

Major reengineering was carried in the 2011-2016 period, during which several new functionalities were set up. The first functionality is central management of demographic and insolvency events. The process is mainly based on information from administrative sources (e.g. court decrees, Register of Transaction Accounts) and statistical algorithms. At entry into the SBR, all units are assigned the new statistical identifier (SIR), which was introduced due to the need to monitor statistical successors. Based on the mentioned statuses, data in the basic integration database SBR are updated weekly, where continuity of SIR is preserved in cases when this makes sense due to demographic events. Central results are then used in fields dealing with enterprises and are welcomed both in data processing and for annual monitoring of business demography, high-growth enterprises, Structural Business Statistics (SBS), etc.

The second functionality is central management of statistical activity code that is different from the administrative one for statistically important units. The enterprise determines the main activity in the Administrative Business Register (ABR) and because this variable is used for different purposes, it does not always reflect the actual situation regarding the operation of units. Therefore, a special group at SURS is striving to determine the main activity in the SBR that would reflect as much as possible the actual situation regarding the operation of units. The statistical code is later on used in data processing in all relevant business surveys.

The third functionality is central management of so-called fictive local kind of activity units (LKAUs). Those units are not a part of administrative databases; they are “virtual” units that statistics generates artificially to help in statistical coverage, processing and observation of actual phenomena and are only part of the SBR. As such they are always part of the enterprise employing at least one person and performing the same or different activity on a different location or a different activity on the same location as existing LKAUs.

Because of the mentioned functionalities, the new SBR simplifies the preparation of the annual master sample frame and increases its quality, coherence, coverage; since it uses the central registration of all units relevant for statistics from the SBR and with better stratification variables (i.e. employment, NACE code, turnover). Basic units of the SBR are legal units or enterprises and LKAUs. The SBR has been regularly preparing the monthly and annual iterations. Monthly iterations became part of the regular data processing in 2015; they have established an annual SBR, that is prepared regularly since 2016.

Due to the complexity, the new functionalities of the SBR will be introduced into the processes and surveys at SURS gradually. The new functionalities namely require the modification and harmonisation of many statistical processes. But in the end it is expected that the use of the SBR in all business statistics is the optimisation of processes, since centrally managed sub-processes and procedures cover and manage changes for all users in the same way. It will also reduce the setting up of different kinds of statistical solutions.

2.2. Enterprise Group Register (national EGR)

Following the requirements of the EU regulation on statistical business registers, in 2006 SURS started to develop also the Enterprise Groups Register (EnGR). Based on the analysis, the four main sources were determined and used: the Central Register of Dematerialised Securities and Monetary Settlement of Securities Transactions for Joint Stock Companies as a source for data on the ownership share of the holder in the resident join stock company, the Court Register as a source for identifying control over other legal units, the Bank of Slovenia with its reports on capital investments among residents and non-residents and the SBR as a source for statistical data on resident legal units and enterprises that are part of enterprise groups, such as an activity code, the number of persons employed, turnover. On the basis of the above mentioned data, the common table of relationships was prepared. This table is the main input in the algorithm procedure for the identification of enterprise groups in Slovenia. Results obtained are then exchanged with EGR.

The EnGR was established due to the need for presenting the data on multinational and resident enterprise groups, as the data source for the EGR and to improve globalisation statistics. It contains data on enterprise groups: resident, truncated and multinational. For the new SBR the EnGR provides information whether the enterprise is a part of the group and, if yes, which group. The SBR

and the EnGR can be directly connected via the legal unit identifier, which every business entity receives at registration in the ABR.

In 2016 the development work continues within the new project, which main objectives is to improve the quality of the national group register with the using of new tools, developed in the frame of EGR2.0, determining the quality indicators, investigating the possibility of implementing the first results of profiling in the registers, contributing to the further improvements of EGR.

3. Modernisation of statistical methodology and processes

As other statistical authorities, SURS is under pressure to produce data faster and at lower costs, to become responsive to users' demands, while at the same time providing high quality output. To at least partly fulfil the above mentioned demands, in recent years a lot of effort has been put into the rationalisation, automation of statistical process and making more use of new or already available data sources. So SURS is more and more transforming from a "data-collector" to a "re-user of data".

3.1. New data sources

In countries with well-developed systems of registers, such as Slovenia, practices in the use of various administrative sources for the purpose of conducting statistical surveys are also well-established. In SURS, from its beginning in 2003 the SBS has been conducted entirely on the data from annual accounts and other administrative sources.

The next important fields where administrative sources are widely used are Short-Term Business Statistics (STS) and External Trade Statistics. Since 2008 monthly turnover indices in retail and wholesale trade and other services have been calculated using two types of data. For the small number of the largest units the data are still collected in the field. These units cover around 60% of the total turnover. For the remaining, majority part of the population, the VAT data are used to estimate monthly turnover. The table below shows the reduction of the response burden resulting from the transition to the use of administrative sources in the case of retail and wholesale trade and other service statistics.

Table 1. Essential reduction of the STS surveys response burden

Survey	Sample size of field units	Sample size of all units	Sample size of field units	Sample size of VAT data units
	2007	2016		
Turnover in Retail trade	1,300	2,900	270	2,630
Turnover in Wholesale trade	1,620	3,800	100	3,700
Turnover in Services	2,670	8,900	880	8,020

Source: SURS

The last example of the transition from data collection in the field to the administrative source was done in 2016 in the case of statistics on building permits. The source of data for statistics on building permits is now the Spatial Information System managed by the Ministry of the Environment and Spatial Planning. In this system now municipalities directly entering also the data on issued building permits, while in the past they sent them to SURS on paper. Due to the transition to the administrative source, SURS also revised the entire survey and rationalised the data set to be collected. It was also estimated that for SURS the savings, due to transition to administrative sources, are around EUR 10,000 annually.

All together currently more than half of surveys where business entities are included are conducted entirely or partly on the data from administrative sources. SURS's practice is also to sign with each institution an agreement on the transmission and use of data and a technical protocol; this provides an opportunity to have a say in making any changes to the data source and insuring the stability of administrative data collections.

In addition to the increased use of administrative data sources, more recently a lot of work has been done on the re-use of data already available for other purposes, e.g. through the exchange of micro-data, linking data from different statistical areas and thereby creating new statistics and indicators.

The micro-data exchange system is already in place and in use within the EGR. During the last two years it was tested also in another important business area, i.e. monitoring of trade between EU Member States (Intrastat). Intrastat is, despite some simplifications, one of the most burdensome surveys for enterprises. Consequently, it was decided in late 2011 that it is necessary to reduce the burden by taking into account the principle that data are not collected

more than once and so reducing the reporting burden on enterprises by approximately 50% compared to the current Intrastat system and at the same time providing high-quality statistical data. The result was the launch of the SimStat (Single Market Statistics) project, in which Slovenia also took part. The main idea of this project was exchange of micro-data on export between MSs to then estimate the data on import on the basis of mirror data. For this purpose, SURS set up a new database and the entire infrastructure necessary for secure exchange of micro-data on dispatches of goods between EU Member States (MSs). The project showed that the exchange of micro-data between MSs is possible from technical as well as from the safety point of view, but before regular use some methodological and legislative issues should be determined and agreed. Nevertheless, SURS has already used the exchanged data also to check the regularly collected data, to improve some quality controls and to study the always problematic asymmetries.

Despite the large volume of data, conventional international trade statistics do not offer insights into the actors actually engaged in cross-border trade, so in recent years a new exercise has been started. **Trade by Enterprise Characteristics (TEC)** aims to fill this gap, and i**t answers questions such as which are the enterprises that are engaged in foreign markets, and what are their characteristics.** The survey, which SURS started in 2013, is based on linking external trade statistics data with structural business statistics data and especially with data from the SBR. **TEC** presents data on the structure and concentration of Slovenia's trade in goods (export and import) by characteristics of enterprises (exporters and importers) such as size, sector of economic activity or level of concentration. These data are also an important additional analytical tool for studying Slovenia's economic participation in a globalized world and allow a deeper analysis of the impact of international trade on employment, production and value added.

3.2. Modernisation of data collection

Electronic data collections present new challenges and opportunities. To simplify and accelerate data reporting in business statistics, in 2013 SURS introduced electronic data reporting, i.e. so-called e-STAT. After testing, such a method of data reporting is first being introduced in monthly surveys, which contributes the most to reducing the reporting burden of business entities. For business entities a special website with technical and practical information on the e-reporting system and on individual surveys was also set up and a special section was created within SURS. Electronic data reporting is now enabled for the majority of

business surveys and, as shown in Table 2, was very well accepted by the business entities. In most surveys the response rate in 2016 was over 70%.

Table 2. Introduction of e-collection/reporting in business surveys

Name of the survey	Periodicity	Sample	Transition to e-reporting	WEB response (%)	Overall response (%)	Institution collecting the data
Industrial production	Monthly	1,900	2013	84	95	SURS
Turnover in retail trade	Monthly	270	2014	86	99	SURS
Turnover in wholesale trade	Monthly	100	2014	93	99	SURS
Turnover in services	Monthly	880	2014	84	97	SURS
Production in construction	Monthly	200	2016	70	80	SURS
Business tendency	Monthly	2,700	2014	52	98	SURS
Earnings paid out by legal persons	Monthly	57,000	2005	80	80	AJPES
Intrastat	Monthly	7,500	2009	100	100	FURS
Job vacancy	Quarterly	2,800	2015	45	93	SURS
Performance of enterprises	Quarterly	3,400	2011	90	90	AJPES
ICT usage in enterprises	Yearly	2,000	2013	68	85	SURS
Business services	Yearly	2,000	2010	85	85	AJPES
Labour cost	Every 4 years	4,000	2009	90	90	AJPES
Structure of earnings and working time	Every 4 years	3,100	2007	82	82	AJPES

Source: SURS

SURS has also quite a lot of experience in electronic data collection in cooperation with other institutions, i.e. with the Financial Administration of the Republic of Slovenia (FURS) in external trade and with the Agency of the Republic of Slovenia for Public Legal Records and Related Services (AJPES) in several surveys.

Data for Intrastat have been collected with a statistical questionnaire via the national Intrastat information system since 2007. Most of the reporting units immediately transmitted their data electronically (data are collected, verified and

harmonised then by the Financial Office Nova Gorica), which significantly reduced the administrative burden of data reporting. For implementing external trade statistics and the quality of its data, good cooperation between SURS and the Financial Administration, which takes place at professional and operational level, is very important and necessary.

SURS has even slightly longer cooperation in the collection and exchange of data with AJPES; since 2005, when the two institutions joined their questionnaires on data on earnings of persons in paid employment into a common e-questionnaire. In this way the reporting burden was greatly reduced and data collection was rationalised. In the following years this cooperation was extended to another six surveys as well as on exchange of some important administrative sources (e.g. ABR, annual accounts, register of transaction accounts).

The further use of administrative and other sources as well as good cooperation with institutions, responsible for them is for sure one of the SURS`s key direction also in the future.

3.3. Rationalisation of statistical processes

Statistical data processing has always been a demanding, time consuming and consequently a very expensive task. For the purpose to reduce costs and also rationalise the statistical processes SURS has begun with systematic work on developing the generalised system for data processing called SOP (statistical data processing) several years ago.

SOP is within SURS indicating renewed implementation procedures, statistical processing of the following basic elements:

- A standardized database organisation of microdata.
- General programs, based on metadata ("metadata-driven") programs for data processing.
- The user application for centralized management procedures, called MetaSOP.

Acronym SOP also represents a group within SURS dealing with the introduction and implementation of the SOP procedures at the operational level. The primary purpose of introducing SOP procedures is to standardize and with general software solutions to modernize the statistical processes. SOP largely eliminates

the practice of developing for each individual survey software solutions for data processing, whose main disadvantages are patchy and non-standardized procedures for statistical processing of data and the resulting lack of transparency and efficiency.

The MetaSOP application is a tool for the introduction of process metadata and for the launching of static data processing for individual surveys. MetaSOP statistical processing of data is carried out by calling web services, written in the SAS environment. Calls to web services provide for appropriate data processing and export them to the database. General programs are standardized for all surveys and are based on a common methodology. Metadata and macro data are stored in a common database and are organised in accordance with uniform rules and easily accessible.

With the development of the MetaSOP application and general software solutions, SURS made a big step forward towards a process-oriented organisation conducting surveys, particularly in data management (which includes logical control, correction, insertion) and aggregation and tabulation (which includes the calculation of aggregates, sampling error, statistical protection and tabulation).

At the moment statistical data processing is implemented based on general software solutions in most surveys coming from business statistics. Successful implementation of SOP was possible only with good cooperation between experts from general methodology, IT and statistics. In this way also a significant rationalisation of procedures was achieved, since it is no longer necessary to develop software solutions for each individual survey. The application also enables complete repeatability and traceability of individual phases of the process, which increases transparency and clarity of used procedures. In the coming years SURS will continue to introduce general software solutions into the remaining surveys and is planning to develop some new functionalities.

4. New business indicators

Over the last several decades there has been significant growth in the services sector in all economies and a growing recognition that current data and indicators are no longer adequate for tracking different activities in economy over the course of the business cycle. Current indicators, mainly from traditional producing and trading sectors, need to be accompanied by similar information for the services sector.

Within the modernisation of business statistics, for services and trade it is proposed to set up a new monthly Index of Services Production (ISP), to switch from quarterly calculation of the turnover index to monthly calculation, to extend the coverage of the service by including additional service industries in the computation of Service Producer Price Indices (SPPIs), and by a comprehensive trade volume indicators. Furthermore, some of the deadlines for data transmission should be shortened for improving the timeliness and a set of data in all areas of business statistics should be harmonised and thus extended to all areas of service industries.

Given the mentioned new requirements, some have already been implemented in SURS (e.g. monthly production of turnover index on services, publication and transmission of data). To fulfil the remaining, a special project was launched in 2015, under which SURS started to monitor the new service industries, explored all available sources and price indices that can be used for setting up the most appropriate deflators for Wholesale trade (G46) and ISP.

Analysis of the data on turnover for industry L68 indicated that in the case of real estate service industry indices can be produced from the combined sources of data, the main source being the administrative VAT data. In addition, the methodology and the production process were determined for the preparation of required deflators and first experimental calculations were done for service industries for which both turnover data and matching deflators had already been available (in case of ten service industries). Some tasks in this process were quite challenging. Some price indices are namely produced quarterly and so firstly have to be extrapolated to the monthly periodicity. Another issue is that not all price indices are available. Currently only half of the required service industries are covered in SPPIs. In the coming years it is planned to develop all the missing ones. In the first phase during 2017 price indices for the four most important service industries – i.e. Accommodation (I55), Real estate activities (L68), Rental and leasing activities (N77), and Travel agency, tour operator reservation service and related activities (N79) – will be developed. In continuation it is also planned to explore and evaluate which existing statistics or other data sources can also be used for upgrading current deflators and in the end to set up a regular production and publication of a monthly ISP, expected in 2018.

Since the set of data in all areas of business statistics should be harmonised and thus extended to all areas of service industries, by 2020 the coverage in the SBS and Foreign Affiliates Statistics (FATS) will be extended to the activities

Education (P), Human health and social work activities (Q), and Arts, entertainment and recreation activities and other activities (R).

Business demography data are also an important subject for policy-maker's discussion about increasing the level of employment and also the demand for these data is growing rapidly. Business demography namely provides information on births, deaths and survival rates of enterprises, as well as information on related employment data. Enriching business demography data with breakdowns by region (incl. by size class), quarterly data on registrations and bankruptcies, and the number of young high growth enterprises (gazelles) will increase the amount of information. First pilot exercises have already been carried out.

Globalization has become something common, but it has emerged the need, both to monitor new statistics as well as to differently monitor certain existing statistics. One of the ways to better monitor the globalization is also the right determination of the surveyed units by using profiling. Profiling represents a new way of defining statistical units when in the Global Enterprise Group (GEG) lower statistical units i.e. Global ENterprises (GEN) are defined on the basis of the so-called "top down" method.

Under the first project SURS analysed links for 5 enterprise groups (4 with headquarters in Slovenia and 1 with headquarters outside the EU) and cooperated in profiling by some other EU MSs (as a partner country). In this regard, there is still some work to do, i.e. re-profiling of existing enterprise groups, examination and testing of the automatic profiling mode, the transmission of the results to the EGR and the continuation of cooperation in its development and in the final phase also the introduction of the results obtained from profiling in our business surveys and the SBR. It is also planned to develop algorithms for automatically determining the smaller units, and their automatic consolidation of some SBS variables. In this way it will be possible in the future to develop business statistics based on a combination of legal units. But in all cases the profiling is very complex challenge that requires a lot of time and human resources with good knowledge from economy, accounting, communication etc. On the other hand first results, obtained from automatic profiling do not differ so much from current ones.

5. Conclusions

The presented work and activities in the field of business statistics and beyond show that SURS has been facing many challenges and development tasks in the

last couple of years. Some of them are finished, but many of them are still in the development phase or even on the "to do" list.

The SBR is thus becoming the backbone of business statistics and has been regularly preparing the monthly and annual iterations. In continuation its new functionalities have to be fully introduced into the statistical processes and surveys, which also is challenging task.

The different administrative sources are widely used in various statistical surveys, but nevertheless new ones are all the time taken into the consideration for their possible use. Big data are currently one such possible, promising new source of data, which can possibly be used to provide auxiliary variables in models that estimate economic phenomena at detailed geographical level, or to "nowcast" macroeconomic series, or just to provide additional information on enterprises.
For business statistics to be flexible, relevant, timely, inexpensive and friendly to reporting units, the modernisation and standardisation of individual statistical processes and the development of missing economic indicators remain the first priority and practically the only way forward.

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ANALYSIS OF THE EFFECTS OF SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS ONSTUDENTS' ACADEMIC ACHIEVEMENT

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Abstract

This paper examines the impact of selected socioeconomic and demographic variables on the success of students at the Department of Professional Studies, University of Split, Zagreb Teaching Centre, in the colloquium of business statistics in the second semester, the academic year 2009/10. Independent variables in the model are: the percentage of students’ presence at lectures and exercises, the amount of time spent in self-study, gender, age, employment status, personal study conditions and parenting status. The dependent variable is the number of points achieved at the colloquium. The research results confirmed some assumptions. The students’ regular attendance of both lectures and exercises has a positive impact on the number of points in the colloquium. A positive impact on the success in the colloquium was confirmed for the variable the time spent in self-study, too. Also, students who rated their own study conditions by grades good (3) and very good (4), on a scale from 1 to 5, had significantly better results than other students. The other variables such as age, gender, employment and parenting did not prove to be statistically significant.

Keywords: education, higher education, linear regression model, regression diagnostics model validation, academic achievement

JEL classification: C20, C52, I20, I21, I23

1. INTRODUCTION

The research presented in this paper focuses on the impact of the chosen variables on the students' academic achievement in the course in business statistics measured in written colloquia within professional study programmes at the university level. The empirical analysis relates to the students of the Department of Professional Studies, University of Split.

The professional study programmes were introduced due to changes in the labour market. Modern companies need highly educated professionals with their professional knowledge which they can use in their respective fields and thus enhance companies' competitiveness in the market. For this reason, the education system should be constantly enhanced in order to educate the professionals who could fulfil the requirements of an increasingly demanding market. Consequently, there is also a need to conduct scientific research on the quality of education.

The quality of the formal education system is one of the foundations of the development of human resources' competitiveness. In the developed countries there seems to be a high correlation between higher educational levels and economic growth. Every additional year of education of the population increases the production per inhabitant by 4%-7%. Besides the quantity, the quality of education also has a great impact on economic growth.

By joining the European Union, the Republic of Croatia demonstrated its readiness to implement the reforms required to enhance the competitiveness at the global economic level. Croatia committed to build the education system which would deliver a highly qualified work force ready for direct competition with the employees from other member states. In the next several years, Croatia needs to quickly shift its focus on knowledge-based industries and jobs as well as innovation-driven economic growth. In such conditions, the employees will need to be capable of quickly changing workplaces, directly cooperating with the users, managing themselves and their work environment as well as participating in lifelong learning (Barić, 1996, 1998, 2004).

In order for individuals to stay competitive in the business environment, they should acquire knowledge and skills on a continuous basis throughout their life. Professional study programmes, which are a relatively recent form of education in Croatia, also offer that possibility.

A professional study programme enables the students to acquire an appropriate level of knowledge and skills for performing professional jobs and trains them to directly participate in the work process. Unlike university study programmes, professional study programmes are focused on practical and

applicable knowledge. Therefore, many lecturers in professional study programmes are individuals with practical experience in the field they teach.

In developed European countries, about 70% of students are enrolled in professional study programmes. In Croatia, professional study programmes have been neglected for a long time but currently the number of students completing professional study programmes is raising (Krivačić, 2010).

The aim of this paper is to assess which variables contribute to academic achievement within a course in business statistics.

The main research hypothesis examined is whether regular class attendance has a positive impact on the achievement at the exam of the students attending a course in business statistics within a professional study programme. Furthermore, a hypothesis of whether a number of socio-economic and demographic variables has an impact on students' final result is explored so the analysis of the dependence of the students' achievement at the exam in business statistics and the variables such as the amount of time spent in self-study, gender, age, employment status, personal study conditions and parenting status is conducted.

A linear regression model based on Bahovec and Erjavec (2009) as well as appropriate statistical hypothesis testing methods based on Dumičić et al. (2011) are used in the research. Hypotheses are tested by means of multiple linear regression models and regression coefficients are estimated using the least squares method on the original survey data.

A survey questionnaire was used to collect data as proposed by Žugaj, Dumičić, Dušak (2006) in the form of a personal interview. The survey was conducted among 230 students of the Department of Professional Studies, University of Split, Zagreb Teaching Centre in the second semester of the academic year 2009/10.

2. OVERVIEW OF PREVIOUS RESEARCH

Researchers have for years been investigating the causes of students' success or lack of success in different courses of various faculties in the world. In this section, we provide an overview of previous research that involved the variables the impact of which has been researched in our study as well.

2.1. Impact of regular class attendance upon exam results

A significant number of research studies focused on the impact of class absenteeism on the exam results as well as the reasons of non-attendance. The problem of class absenteeism is not a recent issue and it has existed since the

beginning of organised teaching but the reasons for non-attendance have changed over the years. The issue of class absenteeism was recorded in Oxford as early as in the 14th century (Tuchman, 1979). In the past, class non-attendance was mainly caused by frequent illnesses or student participation in wars while today it is of a very different nature.

The researchers started to inquire about the reasons of class absenteeism and their impact on academic achievement in the second half of the 20th century in the United States. The results of almost all studies show that there is a statistically significant correlation between regular class attendance and exam results regardless of the course and the faculty where the research was conducted. The only difference is in the strength of the relationship so the results vary from a lower to a higher correlation.

One of the first studies which researched the relation between regular class attendance and academic achievement was conducted by Nelson (1973). He studied two groups of students: "regular" ones (up to three absences are tolerated) and "irregular" ones with four or more absences. The research included the total of 320 students in 4 courses taught by 5 different professors within a history study programme at Polk Community College in Florida, USA in the winter semester of the academic year 1972/73. There were twice as much students with regular attendance than those with the irregular one.

The $\chi^2 - test$ proved a statistically significant difference in the final grade between the two groups of students. The probability that the student acquires the highest grade – A is four times higher in a student who is absent only two times from classes then in a student who is absent six times. Among unsuccessful students who did not pass the exam there is a higher number of those who did not regularly attend classes: the exam was not passed by 22% of students with irregular attendance and only by 7% of students with regular attendance.

Hammen and Kelland (1994) subsequently used the data from Nelson (1973) and they discovered a linear regression model explaining the impact of absenteeism (*x*-variable) on the final grade (*y*-variable). The numeric variables were attributed to grades as presented in the Table 1.

Table1. Numeric values attributed to grades

Grade	A	B	C	D	F
Numeric value	4	3	2	1	0

Source: Advances in Physiology Education 267, Vol. 12

The obtained linear regression model equation is $y = 2.915 - 0.198 \cdot x$ with the correlation coefficient $r = -0.83$, i.e. the coefficient of determination $r^2 = 0.69$. A student who attended all classes can expect to obtain the average grade of 3, i.e. B, at the exam and every absence decreases the grade value by 0.198.

A similar research was conducted by Lynette Silvestri (2003) who also divided the students, i.e. pre-service teachers, in two groups: students with "regular" attendance who were absent from up to 3 classes and students with "irregular" attendance who were absent from 4 or more classes. Among the students who regularly attended classes a weak, but statistically significant correlation between class attendance and the grade ($r = 0.235$) was found, while the results of the other group (the students with irregular attendance) indicated a higher level of correlation ($r = 0.525$).

LeBlanc (2005) conducted a studyin the period from 1989 to 2003 within communication courses at four different faculties in the United States which included two hypotheses:

H1: class absenteeism decreases the grade

H2: students achieve better results when classes are compulsory.

The study showed that the students with a higher number of absences have lower grades. The correlation coefficient between absences and the grade was $r = -0.425$.

The second hypothesis which states that better grades are to be achieved if the classes are compulsory was not confirmed – no statistically significant difference was found in the success of the students whose class attendance was compulsory in the comparison with those whose attendance was not.

Davenport (1990) also conducted a research study exploring the impact of absenteeism from law classes on the final grade. The students were divided in three groups: the first group included the students with three or fewer absences, the second group the students with four to six absences and the third group the students with more than six absences. Out of 78 students who participated in the study, 11 students obtained the lowest passing grade or did not pass the exam. It is interesting that all 11 of them pertained to the group with six or more absences. Based on the data analysed by Davenport, Hammen and Kelland (1994) concluded that each absence decreases the number of points by 3.06% with a correlation coefficient $r = -0.81$.

Papić, Milun and Kitić (2010) analysed the records on the percentage of class attendance and academic achievement among 600 students of a professional study programme in business economics at Libertas Business School in Zagreb in the winter semester of the academic year 2009/10. The

results confirmed a correlation between class attendance and achieved grades for all courses over a span of $r \in < 0.37, 0.63 >$ with an average value $r = 0.51$.

During five semesters Hammen and Kelland (1994) researched the impact of class absenteeism on the total score achieved at the exams of 556 second year pharmacy, nursing, dentistry and kinesiology students. The correlation coefficient between class absenteeism and exam results was between $r = -0.22$ and $r = -0.46$, i.e. an average of $r = -0.33$.

The linear model equation was $y = 293 - 1.93x$, where *x* represents the number of class absences and *y* is the total exam score (a maximum possible score was 400 points). A student who attended all classes can expect to achieve 293 points out of 400. Each absence decreases the number of points by 1.93 on the average. The similar results on a negative correlation between class absence and the grade were obtained by some other researchers such as Magdeburg (2001) for students enrolled in a microeconomics course.

Romer (1993) was also interested in this issue in the United States and conducted a study in three faculties of economics. He concluded that regular class attendance had a positive impact on the grade students achieved at the final exam. Similar results were obtained by Halpern (2007) who obtained a correlation coefficient $r = 0.60$ as well as Margaret H. Launius (1997) exploring the relation between regular class attendance and the final grade. Students attend the classes less frequently when their attendance is not compulsory. In addition, she confirmed a positive correlation between exam results and the final grade.

The exception is the result obtained in the research study conducted by Berenson, Cartera and Norwood (1992) which suggests that there is no statistically significant correlation between class attendance and the grade.

To conclude the issue on the importance of regular class attendance, we refer to Thomas and Higbee (2000) who consider that a lecturer, regardless of how interesting and clear in explaining he is, will not be able to reach to a freshman who has no interest in learning and the student who does not come to class will not be successful in acquiring knowledge and skills. Students are responsible for their own success and their effort is in most cases rewarded.

2.2. Time-on-task

Interesting results were obtained in a study conducted by Greenwald and Gillmore (1997) at the University of Washington: there was a negative coefficient of correlation between time spent learning and the grade, i.e. $r = -0.15$. In other words, the more time the student spent learning the poorer were his exam

results. Such an unusual result can be explained by the fact that the study was very large and included courses of different difficulty level. It seems that the students spend more time studying for the courses which are more difficult and they achieve poorer exam results in comparison to less demanding courses where they have better grades. Therefore a correlation between course difficulty level and time-on-task is positive and moderate $r = 0.36$.

The students expect that class attendance and participation be directly included in the final grade. They also consider that they should achieve at least a grade "very good" (4) if they attend lectures and exercises regularly (Moore, 2003).

Olivares (2002) researched the variables correlated with the time-on-task. A negative correlation was found between cognitive abilities and the time spent learning ($r = -0.23$) as well as between time-on-task and expected student grade ($r = -0.19$), while a positive correlation was found between time-on-task and students' previous interest for course content and the level of difficulty of the course content ($r = 0.14$). In addition, the students spent less time learning for courses for which they expected to obtain a higher grade than deserved.

In their paper *Does hard work help students to "make the grade"?* Rau and Durand (2000) obtained a negative correlation coefficient $r = -0.21$ between time-on-task and the test score.

Schuman, Walsh, Olson and Etheridge (1985) revealed that there was a weak, negative and statistically insignificant impact of time-on-task on the exam result.

The aim of the research study conducted by Van den Hurk, Wolfhage, Dolmans and Van der Vleuten in 1998 was to determine the relation between time spent in self-study and academic achievement. The results suggest that there is a weak positive correlation and reconfirm a complex relation between these two variables as well as the importance to conduct further research studies including other variables which might influence the academic achievements. The fact that students' learning effort self-assessment is unreliable (Sappington, Kinsey and Munsayac, 2002) and that pupils and students tend to study less than before (Young, 2002) should also be taken into account.

Since this paper explores the impact of time-on-task on the academic achievement in only one course, a positive correlation is to be expected.

2.3. Gender

Many studies have shown that girls outperform boys in school (Alfan and Othman 2005; Smith, 2004). Boys have lower grades, more problems with

discipline and schooling is less enjoyable for them than for girls (Kleinfeld, 1998). However, some studies, for example the one conducted by Swope and Schmitt in 2006 at the United States Naval Academy did not show a statistically significant difference between men and women, although women were somewhat more successful.

2.4. Age

Richardson (1995) refuted a widely spread opinion that mature students lack skills to successfully learn new material. The study included 38 adult and 60 younger students who attended the same course and it was concluded that mature students achieved significantly better results in understanding what they were learning while they were less successful in reproducing the learned content. Richardson (1995) concluded that mature students are at least equally successful as younger ones. The study conducted by Trueman and Hartley (1996) proved that mature students have better time-management skills while academic achievement in general does not depend on the students' age.

2.5. Employment

Students working full time have lower academic achievement than students who do not work (Hofman & Van Den Berg, 2000), while those having a certain work experience achieve better results during their studies (Gracia & Jenkins, 2003).

2.6. Review of similar studies

Rodgers (2001) conducted a similar study in which he explored the dependence of the success at the exam in basic statistics of students in Economics and the following variables: class attendance, employment (dummy variable), average grade in other courses, year of study (students could have chosen the course in basic statistics during any year of study), full tuition fee payment or not (dummy variable), modality of enrolment to the faculty (standard or special entry), gender and chosen educational level (single degree or double degree). Variables of class attendance and average grade in other courses had a positive impact on the final grade of the course in basic statistics, while the success of the students with a special entry to the faculty was lower than the one of the students who got enrolled based on their high-school grades. Other variables did not reveal to be statistically significant.

Kirby and McElroy (2003) searched for a regression model which shows the impact of different variables on the achievement of freshmen in the economics courses at the University College Cork in Northern Ireland. The following variables proved to be statistically significant: attendance at lectures and exercises, number of points at the enrolment to the study programme (proportional) and the number of working hours (inversely proportional).

In the period from the academic year 2003/04 to the academic year 2006/07, Halpern (2007) conducted a study which included 179 students in airport business management at London Metropolitan University. He explored which variables were significant for the exam success. The following variables revealed as significant: previous work experience, success at the entrance exam, British cultural background, age, work during the study programme and class attendance. Students who had previous work experience, achieved better results at the entrance exam, came from the British cultural background, did not work during their studies, were older than 21 and regularly attended classes were more successful at the exams.

3. EMPIRICAL RESEARCH

The study described in this paper included 230 students of the Department of Professional Studies, University of Split, Zagreb Teaching Centre, in the colloquium of business statistics in the second semester, the academic year 2009/10. In this section each variable will be described in detail and the research results will be presented.

3.1. Description of the variables

Eight independent and one dependant variable will be used in the multiple linear regression model. The impact of the chosen variables on the success in the colloquium in business statistics was explored.

Table2. Description of the variables

Variable	Type of variable	Description	Descriptive statistics
Lectures	Quantitative	Percentage of attendance at lectures	$\bar{x} = 65\%$, $\sigma = 33\%$, $V = 52\%$
Exercises	Quantitative	Percentage of attendance at exercises	$\bar{x} = 87\%$, $\sigma = 22\%$, $V = 26\%$
Gender	Dummy	0-male, 1-female	24% male 76% female
Personal	Qualitative	1=very bad	$\bar{x} = 3.61$, $\sigma = 1.01$,

study conditions		5=excellent	$V = 28\%$
Employment	Dummy	0-unemployed, 1-employed	42% - unemployed58% - employed
Parenting	Dummy	0- does not have children, 1- has children	83%- have no children, 17%- have children
Age	Quantitative	Age	$\bar{x} = 26.02$, $\sigma = 6.87$, $V = 26\%$
Self-study hours	Quantitative	Time spent in self-study	$\bar{x} = 11.77$, $\sigma = 8.55$, $V = 77\%$
Colloquium score	Quantitative	Points earned in the colloquium	$\bar{x} = 58.67$, $\sigma = 22.91$, $V = 39\%$

Source: Authors' calculations

Students on the average attended 65% of lectures, the standard deviation being 33% and a relatively high coefficient of variation of 52%. The exercises attendance rate was higher than the lecture attendance rate and it amounted on the average to 87%, the standard deviation being 22% and a relatively low coefficient of variation of 26%.

The variable *personal study conditions* is a qualitative rank variable estimated individually by the students so a possibility of misperception exists. In order to minimize the misperception, the students were told to take into account the following: whether they have their own room or work space, the possibility to study in quiet, free time they have at their disposal etc. Students were asked to rate their personal study conditions on the scale of 1 to 5, where the value 5 represents excellent study conditions. Students assesed their study conditions with the average grade of 3.61, and the average variation from the average grade was1.01, i.e.28%. The majority of students, i.e. 66% of them, rated their personal study conditions with highest grades: verygood (4) or excellent (5).

The variable *employment* has two modalities: 0-unemployed and 1-employed. Neither the duration of employment, such as full-time or part-time, nor the types of employment, such as permanent employment or temporary employment were explored. Since the Department of Professional Studies does not enrol full-time but only part-time students, a large portion of students, i.e. 58% of them, were working part-time students, and 42% of students were unemployed.

As the majority of students is older than 30, the fact that some students are parents could have an impact on their academic achievement. Students stated if they had minor children living with them in the same household and out of the total number of students 38 of them or 17% have one or more children, while 192 students, i.e. 83%, do not have children. The variable *parenting* was

used in the model as a dummy variable in two modalities: 1 – has children, 0 – does not have children.

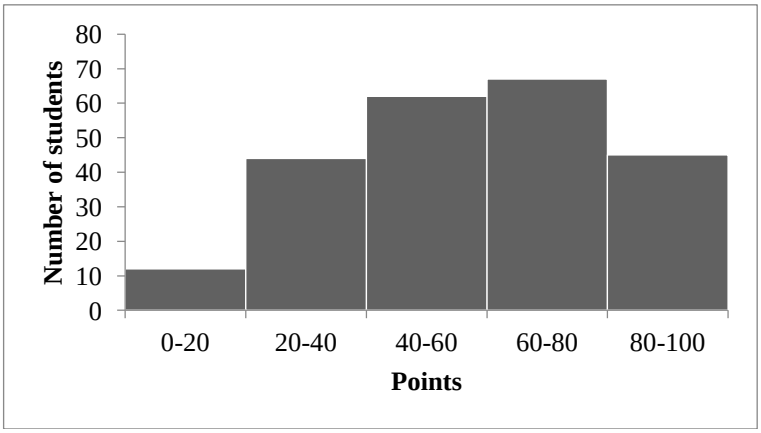
The variable *age* had a range of 31 years. The youngest person who participated in the study was 18 and the oldest 49. The average age is 26.02, with the average variation of 6.87 years arround the mean, i.e. 26%.

The variable *self-study hours* is a quantitative variable which should reveal the amount of time the student invested in self-study. The variable is unreliable for three reasons: the students' self-assessment is often erroneous – it was confirmed that the students incorrectly asses the time spent in self-study (Sappington et al., 2002). In addition, the quality of self-study time differs from one student to another. In the end, although the students were aware of the fact that the number of self-study hours entered into the questionnaire will not affect their grade, there is a possibility that they increased the number of hours so the professor awards them a better grade.

The estimated number of hours spent in self-study ranges from 0 to 48. The students estimated that they spent on average 11.77 hours preparing for the colloquium with the average variation of 8.55 from the average number hours, i.e. a great variability of 77%. The largest portion of students, i.e. 48 of them, prepared for 10 or less hours. Six students stated that they had spent 30 or more hours preparing for the colloqium.

The variable *colloquium score* is a dependant variable. Altogether 230 students took the colloquium and achieved from 1 point (one student) to a maximum of 100 points (two students). The distribution of students based on the achieved scores is presented in the Figure 1.

Figure1. Distribution of students based on the achieved scores in the colloquium in business statistics



Source: Authors' calculations

The majority of students achieved between 60 and 80 points. On average, the students achieved 58.67 points with the average variation around the mean of 22.91 points, i.e. 39%, which indicates a moderate variability of students' achievement in the colloquium.

3.2. Multiple linear regression model

A linear regression model of the population has the following form:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_j x_j + ... + \beta_k x_k + \varepsilon . \quad (1)$$

Regression parameters were estimated using the least squares method.

Using the statistical programme SPSS 20 and applying the Stepwise method the following results are obtained: five variables revealed significant at the 0.05 significance level. The variables and regression diagnostics are shown in the Table 3.

Table3.Regression model

Variable	Variable mark	Coefficients	Standard error	t-value	p-value	VIF
Lectures	X_1	0.121	0.050	2.408	0.017*	1.423
Exercises	X_2	0.166	0.076	2.190	0.029*	1.035
Self-study hours	X_3	0.457	0.167	2.733	0.007*	1.413
Conditions 3	X_4	8.053	3.765	2.139	0.034*	1.183
Conditions 4	X_5	6.686	3.19	2.096	0.037*	1.167
Constant	X_6	27.388	6.093	4.495	0.000*	
Variables not in the model						
Age	X_7			1.215	0.226	1.101
Gender	X_8			0.164	0.870	1.010
Employment	X_9			0.462	0.645	1.082
Parenting	X_{10}			1.205	0.229	1.076
Conditions 2	X_{11}			-0.205	0.838	1.201
Conditions 5	X_{12}			0.635	0.526	1.467
				F-statitic p-value		8.261 0.000
					$\overline{R}^2$	0.137
					n	230
					W	0.819
					BG	0.786
					JB	0.051
					KS	0.200

**statistically significant at 0,05*
Source: Authors' calculation

If a student increases his lecture attendance by 1 percentage point while other variables, i.e. attendance of exercises, hours spent in self-study and study conditions, remain the same, the student could expect to achieve a score in the colloquium in statistics higher by 0.121 points.

If a student increases his attendance of exercises by 1 percentage point while other variables, i.e. lecture attendance, hours spent in self-study and study conditions, remain the same, the student could expect to achieve a score in the colloquium in statistics higher by 0.166 points.

If a student spends 1 more hour in self-study while other variables, i.e. attendance of lectures and exercises and study conditions, remain the same, the student could expect to achieve a score in the colloquium in statistics higher by 0.457 points.

Students who rate their study conditions with the grade 3 achieve on average 8.053 points more than the students who rate their conditions with the grade 1.

Students who rate their study conditions with the grade 4 achieve on average 6.686 points more than the students who rate their conditions with the grade 1.

3.3. Regression diagnostics

In order to determine whether there is a possible multicollinearity problem (linear dependence or approximate linear dependence of regression variables in the model), a correlation matrix was analysed and the necessary parameters were calculated. The correlation matrix is shown in the Table 4.

Table 4. Correlation matrix

	X_1	X_2	X_3	X_4	X_5	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	Y
X_1	1.00											
X_2	-0.11	1.00										
X_3	-0.53	-0.01	1.00									
X_4	0.05	-0.11	-0.07	1.00								
X_5	0.02	0.02	0.02	0.37	1.00							
X_7	0.03	0.02	0.26	0.12	-0.16	1.00						
X_8	-0.02	-0.05	-0.05	0.06	-0.01	-0.04	1.00					
X_9	-0.08	-0.01	0.17	0.20	-0.14	0.59	0.01	1.00				

X_{10}	0.11	0.14	0.21	0.06	-0.13	0.58	-0.16	0.31	1.00			
X_{11}	-0.01	-0.08	-0.02	-0.18	-0.26	0.30	-0.08	0.25	0.32	1.00		
X_{12}	-0.06	0.07	-0.02	-0.26	-0.37	-0.26	0.05	-0.35	-0.19	-0.18	1.00	
Y	0.28	0.27	0.22	0.13	0.06	0.12	-0.01	0.05	0.14	-0.09	-0.04	1.00

Source: Authors' calculation

The data from the correlation matrix indicate that there is no significant linear correlation between independent variables. The strongest correlation revealed to be the one between the age and the employment with the correlation coefficient 0.592, while linear correlation coefficients between other variables were close to zero.

It can be concluded that there is no serious multicollinearity problem since in the analysed model the values of variance inflation factors VIF_j are lower than 5.

Since the empirical significance (0.819) of the White test for heteroscedasticity is higher that the threshold value (0.05), the null-hypothesis of homoscedasticity (invariability) of variance can not be rejected.

The first-order and second-order autocorrelation residuals were tested by the Breusch-Godfrey test. The *Obs*R-squared* value is 0.074 and the empirical significance 0.786 which is higher than 0.05, so the Breusch-Godfrey test confirms that the null-hypothesis stating that there is no first-order or second-order autocorrelation cannot be rejected.

The normality of residualswas tested bythe Jarque-Bera andthe Kolmogorov-Smirnov tests. The results suggest that the empirical significance level for the Jarque-Bera test is 0.051 and for the Kolmogorov-Smirnov test is 0.200 so we conclude that at the significance level of 0.05 the null-hypothesis stating that residuals are normaly distributred cannot be rejected.

4. CONCLUSION

This study focused on the effect of certain variables on students' success in the colloquium in statistics. The research included 230 students of the Department of Professional Studies, University of Split, Zagreb Teaching Centre, in 2010. A linear regression model was developed where the independent variables included the percentage of lecture attendance, the percentage of exercise attendance, the time spent in self-study, gender, age, employment, personal study conditions (in the range from 1 to 5) and parenting. The dependant variable was the score acquired in the colloquium in statistics in the range of 0 to 100.

An estimation of a multiple linear regression model was made whereby statistical packages Eviews3 and SPSS20 were used. The following five variables revealed to be statistically significant: percentage of lecture attendance, percentage of exercise attendance, time spent in self-study as well as personal study conditions 3 and personal study conditions 4. Students who attended lectures and exercises more regularly and spent more time in self-study for the colloquium on average achieved better results. In addition, the students who assessed their personal study conditions with the grades 3 or 4 achieved on average a higher score in the colloquium. Other variables did not reveal as significant. Female students acquired somewhat higher scores in comparison to male students as well as mature students in comparison to young ones, students with children in comparison to those without children, employed students in comparison to the unemployed ones and the students who assessed their study conditions with the grade 5 in comparison to those who assessed them with the grade 1 or 2, but these differences were not statistically significant so it can be concluded that the variables of gender, age, number of children, employment and study conditions 1, 2 i 5 did not have a significant impact on the success in the statistics course.

Since the model validity depends on certain initial assumptions, a regression diagnostics was applied. The testing procedure proved that initial assumptions were not undermined. The multicollinearity problem was verified by means of variance inflation factor calculation. The heteroscedasticity problem was tested by the White's test. Absence of autocorrelation residuals was confirmed by the Breusch-Godfrey test. The normality of residuals autocorrelationwas tested by the Jarque-Bera and the Kolmogorov-Smirnov tests.

The results have shown that students are still not sufficently aware of the importance of attending classes. Although they are familiar with the benefits of regular attendance, students miss on average every seventh class of exercises and every third class of lectures. The results of this study may help various educational stakeholders in improving students' and pupils' results in acquiring course content as well as present a basis for future research on the impact of certain variables on academic achievement.

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ANALIZA UTJECAJA SOCIO-EKONOMSKIH I DEMOGRAFSKIH KARAKTERISTIKA NA AKADEMSKI USPJEH STUDENTA

Rezime

Ovaj rad ispituje utjecaj odabranih socio-ekonomskih i demografskih varijabli na uspjeh na kolokviju iz poslovne statistike studenata Sveučilišnog odjela za stručne studije Sveučilišta u Splitu, nastavni centar Zagreb u 2. semestru nastavne godine 2009/10. Nezavisne varijable u modelu su: postotak prisustva na predavanjima i vježbama, količina vremena provedena u učenju pred ispit, spol, dob, zaposlenost, osobni uvjeti za učenje i broj djece. Zavisna varijabla je broj bodova na kolokviju. Dobiveni rezultati potvrdili su neke pretpostavke. Redovito pohađanje predavanja i vježbi pozitivno utječe na broj bodova na kolokviju. Pozitivan utjecaj na uspjeh na kolokviju potvrđen je i za varijablu: vrijeme provedeno u učenju. Također, studenti koji su procijenili svoje uvjete za rad ocjenama 3 i 4 (na skali od 1 do 5) imali su značajno bolje rezultate od ostalih studenata. Ostale varijable: dob, spol, zaposlenost i roditeljstvo nisu se pokazale statistički značajnima

Ključne riječi: obrazovanje, visoko obrazovanje, linearni regresijski model, regresijska dijagnostika, akademsko postignuće

JEL classification: C20, C52, I20, I21, I23

MONITORING AND EVALUATION: DEVELOPMENT INDICATORS

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Rezime

Today, the concept of monitoring and evaluation has an important role in international development area. Monitoring and evaluation support for the improvement of performance and achievement of the results concerning the intervention of international organizations. International Development is monitored and evaluated by the actors in international arena via several tools including the indicators. At this stage, Statistics has a critical role since the actors in the international development arena need the data in order to measure the performance. Due to this huge demand, statisticians have to measure the indicators related to the development. However, how will statisticians be able to cover all data under this complicated and extremely diverse domain of factors? Therefore, Statistics is not only a tool for monitoring the achievement of international goals and targets but also it is a target itself under the Sustainable Development Goals (SDGs). Within this context, a general framework on the concepts of monitoring, evaluation and indicators is outlined in this paper. While the indicators for the measurement are examined like the functions and types indicators; SDGs, their connection with Statistics and the importance of statistical community in the context of the 2030 agenda are explained. In the final part of paper, considering that Statistics is a development target, the indicators in Statistics area are focused as well as a statistical analysis on one of the indicators of the target 17.19 under the SDGs.

Key Words: *Sustainable Development Goals (SDGs), Indicators, Measurement, Statistics, International Development and Aid.*

JEL Classification: *F35, O2, C19*

Note*: The opinions and arguments expressed in the document are those of the author and do not necessarily reflect the official views of the Turkish Statistical Institute.*

1. INTRODUCTION

Today, the concept of monitoring and evaluation has an important role in international development area. Monitoring and evaluation support for the improvement of performance and achievement of the results concerning the intervention of international organizations. International Development is monitored and evaluated by the actors in international arena via various tools.

In the monitoring and evaluation process, some indicators could be used in order to evaluate the development. At this stage, Statistics has a critical position since the actors in the international development arena need the data in order to measure the performance. Statistical data is an indispensable tool for the international organizations in this process. Due to this huge demand, statisticians have to measure the indicators related to the development. However, how will statisticians be able to cover all data under this complicated and extremely diverse domain of factors? Therefore, Statistics is not only a tool for monitoring the achievement of goals and targets but also it is a target itself under the Sustainable Development Goals (SDGs). The issue was also brought forward in the context of Post-2015 agenda prepared to maintain the Millennium Development Goals. In order for statistical systems to remain relevant and equipped to meet demands, Statistics has been positioned as a development target in the preparation process of SDGs.

Within this context, a general framework on the concepts of monitoring, evaluation and indicators is outlined in this paper. While the indicators for the measurement are examined in detail like the functions, types and selection of indicators; SDGs, their connection with Statistics and the importance of statistical community in the context of the 2030 agenda are explained. In the final part of paper, the selection of indicators in Statistics area to measure the performance are focused. Additionally, a statistical analysis related to one of the indicators of the target 17.19 under the SDGs has been made.

2. WHAT ARE MONITORING AND EVALUATION?

Monitoring and Evaluation (M&E) are important management tools to track the progress and facilitate decision making (Sera and Beaudry, 2007). M&E of development activities provides government bodies, development organizations and civil society with better means for learning from past experience, improving service delivery, planning and allocating resources, and demonstrating results as part of accountability to key stakeholders (World Bank, 2004).

Monitoring is the ongoing process to obtain regular feedback on the progress being made towards achieving the goals and objectives. Evaluation is a rigorous and independent assessment of either completed or ongoing activities to determine the extent to which they are achieving stated objectives and contributing to decision making (UNDP, 2009).

In comparing these two definitions, it can be stated that they are distinct yet complementary. Monitoring gives information on where a policy, program, or project is at any given time (and over time) relative to respective targets and outcomes. Evaluation gives evidence of why targets and outcomes are or are not being achieved (Kusek and Rist, 2004).

In conducting evaluation efforts, there is an internationally agreed evaluation criteria. The criteria and examples of questions for each are as follows:
•Relevance: Do the objectives and goals match the problems or needs that are being addressed?
•Efficiency: Is the programme/project delivered in a timely and cost-effective manner?
•Effectiveness: To what extent does the intervention achieve its objectives? What are the supportive factors and obstacles encountered during the implementation?
•Impact: What happened as a result of the programme/project? This may include intended and unintended positive and negative effects.
•Sustainability: Are there lasting benefits after the intervention is completed (Sera and Beaudry, 2007)

In addition to above mentioned criteria, M&E can be conducted using a wide array of tools, methods and approaches. Core M&E methods can be expressed as stakeholder analysis, documentation review, biophysical measurements, direct observation, cost-benefit analysis (CBA), questionnaires and surveys, semi-structured interviews, case studies (IFAD, 2015).

The other key issue is to build a M&E system in this process. The essential actions involved in building a M&E system are to:

•Formulate outcomes and goals
•Select indicators to monitor
•Gather baseline information on the current condition
•Set specific targets to reach and dates for reaching them
•Regularly collect data to assess whether the targets are being met
•Analyze and report the results

The selection of indicators is one of the most important steps in M&E system. They are effective means to measure progress toward objectives (Kusek and Rist, 2004).

3. WHAT IS AN INDICATOR?

An indicator is a quantitative or qualitative factor or variable that provides a simple and reliable means to reflect the changes connected to an intervention. Indicators enable us to perceive differences, improvements or developments relating to a desired change (objective or result) in a particular context (Church and Rogers, 2006). The objectives of using indicators are to set performance targets, to assess progress and to identify problems through an early warning system to allow corrective action to be taken (World Bank, 2004).

Indicators do not specify a particular level of achievement, thus, the words "improved", "increased", or "decreased" do not belong in an indicator. The change measured by the indicator should represent progress that the programme hopes to make (UN Women, 2015).

The function of an indicator is defined by what it measures in connection with the achievement of an objective. Therefore, there are various types of indicator (Delorme and Chatelain, 2011):

TABLE 1: TYPES OF INDICATORS

Objective level	Indicator Type	Definition	Examples
	Input indicator	Provides information about the financial, human, material, organization and regulatory resources needed to implement the policy in question.	Annual budget deployed; number of people involved in the programme
Operational Objective	Output indicator	Refers to what has been achieved, i.e. the products or services generated.	Kilometres of roads built, the number of people who have completed a training course
Specific Objective	Outcome indicator	Refers to the direct, short-term effects on beneficiaries or recipients.	Time gained by road users;new practices implemented by trained staff; level of satisfaction among

			companies benefited from a consultancy service
General Objective	Impact indicator	Points to the consequences beyond the scope of the intervention itself and its interaction with beneficiaries. This includes any negative or unplanned consequences	Trainee employment rate after 12 months, survival rate of companies established as a result of the programme

In other words, above mentioned indicators are process and result indicators. Process Indicators are used to monitor the number and types of activities carried out. Results Indicators are used to evaluate whether or not the activity achieved the intended objectives or results. Results indicators can be developed at the output, outcome and impact levels. Output indicators illustrate the change related directly to the activities undertaken within the programme. Outcome indicators relate to change that is demonstrated as a result of the programme interventions in the medium-to-longer term. Impact indicators measure the long-term affect of programme interventions (UN Women, 2015).

There are some challenges and considerations when selecting indicators. Ideal indicators may not be practical, the feasibility of using certain indicators can be constrained by the availability of data as well as financial and human resources. When selecting indicators during project preparation and appraisal, it should be used baseline data and comparative data from other programs to set targets for the indicators.

Several sets of criteria have been compiled for the qualification of indicators:

- **Specific, Measurable, Achievable, Realistic and Time-limited (SMART);**
- **Clear, Relevant, Economic, Adequate and Monitorable (CREAM);**
- **Eurostat (logic, relevance, possibility of setting a target, frequency of data collection, appropriateness and possibility of estimating precision). (**Delorme and Chatelain, 2011**)**

4. DEVELOPMENT GOALS AND STATISTICS

There are a number of international initiatives and forces in the International Development which is a wide concept concerning level of development on an international scale. The efforts in international development area were found an answer with Millennium Development Goals (MDGs) which were accepted in 2000 by United Nations. The MDGs consisted of 8 goals and 18 targets to be achieved by 2015, agreed by 192 countries. These included reducing extreme poverty, reducing child mortality rates, fighting disease epidemics, and building a global partnership for development (OECD, 2015). The framework has helped to galvanize development efforts and guide global and national development priorities. While three of the eight goals have been achieved prior to the final deadline of 2015, the progress has been uneven within and across countries. Thus, further efforts and a strong global partnership for development are needed to accelerate progress and reach the goals by 2015 (UN ECOSOC, 2015).

The outcome of the Rio+20 Conference on Sustainable Development initiated an inclusive intergovernmental process to prepare a set of Sustainable Development Goals (SDGs). There has been a broad agreement on the need for close linkages between the two processes to arrive at one global development agenda for the post-2015 period, with sustainable development at its centre (UN ECOSOC, 2015).

In accordance with the outcome document of the Rio+20 Conference, the Open Working Group (OWG) on SDGs was established in January 2013 to prepare a proposal on SDGs. In July 2014, the OWG adopted its outcome document, which contains *17 goals and 169 targets* (Report of the Friends of the Chair Group on broader measures of progress, 2014).

To monitor the implementation of the SDGs, it is important to improve the availability of and access to data and statistics disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts (Open Working Group on Sustainable Development Goals, 2014). The role of the statistical community in the process of the selection of the goals, targets and indicators for the new development framework is critical. There was lack of consultation in the past. The process of selecting the MDG targets and indicators was perceived by countries primarily as a “top-down” initiative, without involvement and consultations with a wide range of stakeholders. The absence of the consultation with national statistical systems is one of the main causes of numerous conflicts and inconsistencies between

national and international data systems on MDG monitoring (Report of the Task Team on Lessons Learned from MDG Monitoring of the IAEG-MDG, 2013). Therefore, involvement of statistical community in the process for goals, targets and indicator selection was one of the essential issues for the new development agenda.

5. STATISTICS AS A SUSTAINABLE DEVELOPMENT TARGET

5.1. Indicators for Statistics

Taking into consideration the targets under the data, monitoring and accountability framework, there is a need to strengthen the capacity of national statistical systems to compile and report development indicators. As a development target in the context of SDGs, how should be made monitoring and evaluation in Statistics area? What will be the role of indicators to measure the performance in Statistics area?

Development in Statistics area is monitored by not only the actors who are responsible for the implementation in the NSO but also international organizations via various tools. These tools include progress reports presented to the international organizations, regular annual assessment meetings, new versions of global assessments, peer review studies, project/programme evaluation missions, compliance monitoring tools and data availability exercises. In this process, some indicators could be used in order to evaluate statistical capacity level. The indicators which may be used for monitoring the Statistical Capacity Building can be expressed below:

TABLE 2: CASE STUDY FOR MONITORING STATISTICAL CAPACITY BUILDING

Objective level	Indicator Type	Definition	Examples for Statistics Target
	Input indicator	Provides information about the financial, human, material, organization and regulatory resources needed to implement the policy in question.	*Domestically and externally funded budget amount for statistics *Number of staff involved in strengthening of statistical capacity programme *Number of adopted new law and regulations *Number of signing protocols with main data

			providers in the countries *Number of countries which have established Statistical Council *Number of countries with formal planning processes
Operational Objective	Output indicator	Refers to what has been achieved, i.e. the products or services generated.	*Number of staff enhanced knowledge on the managerial and technical subjects *Number of people who have completed statistical training courses *Number of consultants' working days provided to National Statistical Systems *Number of servers and computers *Number of data releases
Specific Objective	Outcome indicator	Refers to the direct, short-term effects on beneficiaries or recipients.	*Number of new statistical datasets covered *Number of surveys replaced by administrative registers *Number of surveys benefitting from the use of administrative data sources *Number of micro-datasets provided to the researchers *Number of prepared micro-datasets for public usage
General Objective	Impact indicator	Points to the consequences beyond the scope of the intervention itself and its interaction with beneficiaries. This includes any negative or unplanned consequences	*Percentage of produced indicators for SDGs *Percentage in completeness of data in international publications *Satisfaction percentage of users in satisfaction surveys related to the statistical services *Volume of data validated and published by international

			organizations

When we have a look SDGs and indicators, it is clear that the targets of 17.18 and 17.19 under Goal 17 (strengthen the means of implementation and revitalize the global partnership for sustainable development) are directly related to Statistics area and Statistical Capacity Building. Under Goal 17, the sub-heading of data, monitoring and accountability includes the following targets and related indicators:

"17.18 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts.

17.18.1 Proportion of sustainable development indicators produced at the national level with full disaggregation when relevant to the target, in accordance with the Fundamental Principles of Official Statistics

17.18.2 Number of countries that have national statistical legislation that complies with the Fundamental Principles of Official Statistics

17.18.3 Number of countries with a national statistical plan that is fully funded and under implementation, by source of funding

17.19 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries.

17.19.1 Dollar value of all resources made available to strengthen statistical capacity in developing countries

17.19.2 Proportion of countries that (a) have conducted at least one population and housing census in the last 10 years; and (b) have achieved 100 per cent birth registration and 80 per cent death registration."[14]

Above mentioned five indicators under the 17.18 and 17.19 targets of SDGs can be analyzed by type of indicator considering the Statistical Capacity Building target. If we use same approach in the table of "Case Study for Monitoring Statistical Capacity Building", these five indicators can take place at the following table according to the indicator types as follows:

TABLE 3: CASE STUDY-SDG INDICATORS' TYPES FOR STATISTICAL CAPACITY BUILDING

Objective level	Indicator Type	Definition	SDG Indicators for Statistics Capacity Building
	Input indicator	Provides information about the financial, human, material, organization and regulatory resources needed to implement the policy in question.	**17.18.2 Number of countries that have national statistical legislation that complies with the Fundamental Principles of Official Statistics** **17.18.3 Number of countries with a national statistical plan that is fully funded and under implementation, by source of funding** 17.19.1 Dollar value of all resources made available to strengthen statistical capacity in developing countries
Operational Objective	Output indicator	Refers to what has been achieved, i.e. the products or services generated.	
Specific Objective	Outcome indicator	Refers to the direct, short-term effects on beneficiaries or recipients.	17.19.2 Proportion of countries that (a) have conducted at least one population and housing census in the last 10 years; and (b) have achieved 100 per cent birth registration and 80 per cent death registration.

[14] United Nations Statistics Division, 2017, Report of the Inter-Agency and Expert Group on Sustainable Development Goal Indicators (E/CN.3/2017/2)

General Objective	Impact indicator	Points to the consequences beyond the scope of the intervention itself and its interaction with beneficiaries.	**17.18.1 Proportion of sustainable development indicators produced at the national level with full disaggregation when relevant to the target, in accordance with the Fundamental Principles of Official Statistics**

As it is seen at the table above, the indicators of **17.18.2, 17.18.3 and** 17.19.1 are input indicators for Statistical Capacity Building in the context of SDGs since these are related to **national statistical legislation, national statistical plan and the** resources made available to strengthen statistical capacity in developing countries.

The indicator of 17.19.2 can be evaluated as outcome indicator since it is related to conducting population and housing census and accordingly achievement of birth and death registration.

The indicator of **17.18.1 is impact indicator for statistical capacity building efforts, which ensures production of sustainable development indicators at the national level with full disaggregation.**

5.2. Statistical Analysis for an Indicator

The indicator of "17.19.1 Dollar value of all resources made available to strengthen statistical capacity in developing countries" which was also examined above aims to provide US Dollar value for statistical capacity building in developing countries. This indicator only addresses international support to statistics and does not account for domestic resources as it is stated in its metadata.

PARIS21 prepares Partner Report on Support to Statistics (PRESS) each year to present the US dollar value of ongoing statistical support in developing countries. PRESS numbers on this issue are based on the Creditor Reporting System (CRS) for Official Development Assistance (ODA) commitments supplemented by voluntary reporting from additional donors. We can say that the data sources for the indicator 17.19.1 are OECD CRS and PARIS21.

This indicator was evaluated as an input indicator since it provides information about the financial resources needed to strengthen statistical capacity. When we

deal with the figures of PARIS21, we may have a detailed information on the international aid for statistical capacity bulding. Further, we may think about what is the impact of financial resources on Statistical Capacity Building (SCB). How can we measure it? In order to find an answer to this question, we can approach The World Bank's Statistical Capacity Indicator. It provides an overview of the statistical capacity of over 140 developing countries. It is a composite score assessing the capacity of a country's statistical system. It is based on a diagnostic framework assessing the following areas:

- methodology
- data sources
- periodicity and timeliness.
-

For each dimension, a country is scored against specific criteria, using information available from the World Bank, IMF, UN, UNESCO, and WHO.

Countries are scored against 25 criteria in these areas, using publicly available information and/or country input. The overall Statistical Capacity score is then being calculated as simple average of all three area scores on a scale of 0-100.
When we deal with the figures of PARIS21 and the World Bank SCB scores, can we conclude a result? What is the impact of international financial aid to statistics on the World Bank SCB scores? Is there any correlation between two variables?
It has been analysed the correlation between them using the figures of PARIS21 on total international support in the years of 2006 and 2012 and 2015 World Bank SCB scores for some countries. In order to do this, the total commitments between 2006 and 2012 for statistics has been calculated for 94 countries. When selecting 94 countries, the available data for the total commitments between 2006 and 2012 for statistics in PARIS21 database and year 2015 data in The World Bank's Statistical Capacity Indicator database has been considered. The countries which do not have any data in related databases, have been removed from the list. In other words, an intersection of two sets has been found and 94 countries simultaneously have the figures in both sets.

The reason to calculate the correlation between the total commitments to the countries for 2006-2012 and 2015 Statistical Capacity Scores of countries (three years after 2012), is that National Statistical Systems need a reasonable time to make progress after getting international aids during the implementation process in the context of their capacity building efforts. Further, the realization of commitments by donors may take time.

According to the correlation analysis between these two data sets at the attachment for 94 countries, the following findings have been reached:

- **The correlation** between the total commitments between 2006 and 2012 and 2015 Statistical Capacity Scores is **%23,4**. There is **positive correlation of %23,4** between two variables.
- **The correlation level is significant** according to the regression analysis. If we deal with used methodology and analysis in more detailed manner, it should be stated that Pearson correlation has been calculated as 0,234 using SPSS package programme. The correlation is significant at the 0,05 level (2-tailed) since Ho is rejected (0,023<0,05).

Concerning the regression analysis, although R Square value is quite low, according to the Anova method, the regression model is significant (0,023<0,05). Since there are several factors to build the capacity in the countries, it is logical to not explain the capacity scores with the only international commitments. There are several variables or factors for capacity building such as legal infrastructure, autonomy, human resources, infrastructure and technical resources, internal financial resources, coordination roles of NSOs and culture etc.

6. CONCLUSION

In the context of Post-2015 agenda, monitoring of the SDGs and the related targets is key topic and statistical community has a critical position since the actors in the international development arena need the data in order to measure the performance. While Statistics area has this important role in the monitoring and evaluation of SDGs, strengthening of statistical capacity should be focused as one of the targets under the Post-2015 agenda in this process. The selection of indicators for the performance measurement in Statistics area is an key issue. In order to evaluate statistical capacity level, results oriented indicators would be developed at the output, outcome and impact levels. Moreover, in medium term, outcome indicators and impact indicators could be focused. The international community needs the data for measurement of development goals and targets. Therefore, statistical community should consider the data availability issue under the quality criteria and in the context of the development target in Statistics area, the performance indicators for related programmes/projects should be determined as result oriented indicators rather than input oriented.

Three (17.18.2, 17.18.3 and 17.19.1) **of five indicators under the 17.18 and 17.19 targets of SDGs are input indicators. The other two indicators (17.19.2 and** 17.18.1) **can be defined as respectively outcome and impact indicators.**

As it is seen, most of them have been formulated as input oriented indicators instead of result oriented indicators**. Under these conditions, how can we evaluate the impact of inputs on statistical capacity building in the countries? The data analysis shows that** there is a positive correlation between the total commitments in the years of 2006 and 2012 and 2015 Statistical Capacity Scores. It is clear that the international aid to statistics positively effects the statistical capacity building. Although 17.19.1 is defined as input indicator, we can say that it is one of the key factors which make positive contribution to the intended result. In this respect, it is evident that the selection of this indicator under the SDGs is logical. Moreover, existence of the indicator related to international aid for statistics in the context of SDGs ensures drawing attention of international community and continuing the international support. The analysis also verifies that the international support should be continued with the object of strengthening the statistical capacity in the future.

Enc.:

1. Total international aid for Statistics between 2006 and 2012 and 2015 World Bank Statistical Capacity Building scores for 94 countries
2. SPSS Results

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CAUSAL IMPACT OF PUBLIC REVENUES AND PUBLIC EXPENDITURES IN REPUBLIC OF MACEDONIA

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Analyzing the relationship between public revenues and public expenditures is vital for establishing appropriate fiscal policy crucial for appreciating the consequences of unsustainable fiscal deficits and as a result in addressing such imbalances due to the fact that fiscal policy is important tool for promoting price stability and sustainable growth.

The main purpose of this paper is to investigate the causal relationship between public expenditures and public revenues in the case of Republic of Macedonia, conducted through monthly data for the time period from 2000 to 2015, by using Granger causality and Vector Error Correction Model (VECM) tests methodology. Data properties were analyzed to determine their stationary by using Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) test for unit root. Additionally, in order to test the causality between the series of public revenues and public expenditures, it's necessary to verify if the two series are co-integrated therefor Johansen test for co-integration is implemented. Moreover, for modelling variables in a manner that conquest in severable characteristics of its time series, we use SIC, AIC and HQIC to properly define lag structure of the series. Although plenty of empirical research is available on revenue and expenditure relationship yet there is no consensus about the causal link between these variables.

Due to the available theoretical and empirical findings regarding the causal link between public revenues and expenditures both in developed and developing countries, an existing consensus regarding the nexus of these variables is not found so far. Moreover, based on the empirical side of causal link between public revenues and expenditures, there is no a discernable pattern among countries, thus demonstrating country specific analysis results. Despite the significance of a proper understanding of relationship between public expenditure and revenue in formulating fiscal policy, there is scanty empirical study for the case of Macedonia. Theory implies existence of three main hypotheses regarding the relationship of public revenues and expenditures: tax and spend hypothesis, spend and tax hypothesis and fiscal synchronization, while results regarding the case of Macedonia, are addressing to the third hypothesis, thus fiscal synchronization for the analyzed time period 2000 – 2015.

In addition, this paper tries to add a solid contribution to the empirical debate of the causal link between public revenues and public expenditures by using data from a transition country such as Republic of Macedonia, to be used as further recommendation regarding budget deficit planning policy for the future.

***Keywords**: Public revenues, Public expenditures, Budget deficit, Granger causality, Vector Error Correction Model.*

***JEL classification:** E620, H20*

1. INTRODUCTION

The existing debate regarding the causal link between public revenues and public expenditures as well as the significant impact of budget deficit for stimulating economic growth, it has become an issue analyzed from many scholars among years globally.

The causal relationship between public expenditures and revenues shows to be an important public policy implication due to the fact that budget deficits and controls of size of government are emphasized as dependent on this relationship (Baghestani and McNown, 1994; Ross and Payne, 1998). Moreover, this relationship is vital for establishing appropriate fiscal policy crucial for appreciating the consequences of unsustainable fiscal deficits and as a result in addressing such imbalances (Eita and Mbazima, 2008). Fiscal policy is important tool in promoting price stability and sustainable growth, income and employment (Wolde - Rufael, 2008; Fasano and Wang, 2002). Despite the significance of a proper understanding of relationship between public expenditure and revenue in formulating fiscal policy, there is scanty empirical study for the case of Macedonia and Albania. Theory implies existence of three main hypothesis regarding the relationship of public revenues and expenditures: first theory that is argued by Friedman in 1978, is for "tax and spend" hypothesis. Based on this theory there is present unidirectional causality that runs from revenue to expenditure implying an increase in revenue to increases public expenditure. (Chang, 2009; Al-Zeaud; 2014). Second hypothesis is "spend and tax" hypothesis, that suggests public expenditures to lead public revenues (Baghestani and McNown, 1994). The last but not the least hypothesis is "fiscal synchronization" suggested by Musgrave (1966), that is arguing that decisions regarding public revenues and public expenditures are determined jointly, thus there is bidirectional causality between them (Chang, 2009), where are also based the results of our analysis. Moreover, for obtaining appropriate financial policy in a particular country, it is necessary to define and analyze the relationship between public revenues and expenditures, which in this analysis is done through VAR model, as well as are seen the Impulse response function and Forecast error decomposition regarding the instantaneous effects of public revenues and public expenditures in Republic of Macedonia during the period 2000 – 2015.

Further, the paper is consisted from: the first section displays the review of economic and empirical literature on the behalf of this paper. The second section

includes the empirical modeling, data and results of the analysis, the third section deals with the conclusions and further recommendations.

2. LITERATURE REVIEW

Although plenty of empirical research is available on revenue and expenditure relationship, yet there is no consensus about the causal link between these variables. Indeed, it is noted unidirectional causal evidences from revenue to expenditure and from expenditure to revenue available in the literature and on the other side there exist some studies that claim bidirectional link between these variables.

Al-Zeaud (2014) examines the causal relationship between government revenues and expenditures in Jordan for the period 1990 to 2011 using Granger causality and VECM tests methodology and he discovered that there is a stable long-run equilibrium relationship between government revenues and expenditures, although, they may be in disequilibrium in the short run. He also concluded that there exists bidirectional causality between public revenues and expenditure during this period.

Mehrara and Rezaei (2014) investigated the nexus between public revenues and public expenditures in IRAN by using annual data and Toda - Yamamoto Granger causality test for the period 1978-2011. Their conducted analysis found results consistent with the revenue-spend hypothesis thus unidirectional causality from public revenue to public expenditure. The relationship of public revenues and expenditures was also investigated by Rafaqet and Mahmood (2012) through using annual data for Pakistan for time period 1976 – 2009 and applying Granger Causality and Johansen co-integration methodology and concluded that there is no evidence for causal relationship of public revenues and expenditures in the short run in Pakistan. Moreover, Saeed and Somaye (2012) analyzed the long term and causality relationship between public revenues and expenditures in oil exporting countries for time period 2000-2009 through using P-VAR techniques and results showed positive and unidirectional nexus between oil revenues and public expenditures. In their study, Nyamongo et al. (2007) analyze public revenue and expenditure nexus in South Africa by using monthly data and unit root test and Vector Error Correction Model (VECM) and found that public revenue and expenditure are co-integrated where it is evidenced a long-run relationship between them. Moreover, through applying Granger causality, they founded a bidirectional Granger causality that supports fiscal synchronization hypothesis. On the other side, Tsen and Kian-Ping (2005) examined this nexus

for Malaysia during period 1965 – 2002 and applied Augmented Dickey-Fuller and Phillips Perron Unit root tests, as well as Johansen co-integration and Error Correction Models was applied to their research. Finally results supported tax-spend hypothesis, thus public revenues Granger cause expenditures in Malaysia during analyzed period.

3. ECONOMETRIC MODEL AND RESULTS OF CAUSALITY BETWEEN PUBLIC EXPENDITURES AND REVENUES IN REPUBLIC OF MACEDONIA

The objective of this section is to investigate the interdependence as well as the presence and the direction of the causality between public expenditures and revenues in the case of Republic of Macedonia. Moreover, I emphasize the time period for this investigation to be 2000 – 2015, where I have used monthly time series for the variables included in this analysis. So far, I have seen the existing empirical working papers for finding the direction of the causality relationship between public revenues and expenditures, where they have claimed to use the granger – causality tests and VECM method also applied to my empirical research as well. Indeed, for finding the relationship between public expenditures and revenues in Republic of Macedonia, I have adopted a two-step procedure for this analysis. The first step is regarding the evaluation of the existence of a unit root between public expenditures and revenues through the analysis of Augmented Dickey Fuller and Philips-Perron test. On the other hand, the second step refers to the investigation of the causal relationship between the series of public expenditures and revenues in the long – run, by using VECM and Granger causality Wald test. Since when series are non – stationary at their level and stationary at first difference, then it should be used the Vector Error Correction Model (VECM). Moreover, the analysis firstly I test for unit root versus stationarity. But firstly, regarding the monthly data for Total Public Revenues (TR) and Total Public Expenditures, summary descriptive statistics is available in the following table.

Table1: Descriptive statistics

Variables	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis
TR	8844.229	9428.5	15827	2801	3340.314	-.001724	1.826922
TE	9468.021	9549.0	22891	2833	4068.593	.2671511	2.351179

Source: authors calculations.

From the Table 1, we can see that the mean value of Total Public Revenues is 8844.229, while this value for Total Public Expenditures is 9468.021. If we can see the median values, that of TR is 9428.5 while the median value of TE is

9549. The next two columns are about the maximum and minimum values of TP and TR, where maximum value for TP and TR are 22891 and 15827, while for minimum value we can note 2833 and 2810, respectively. Moreover, regarding the standard deviation value for Total Public Revenues and Total Public expenditures are 3340.314 and 4068.593, respectively. The values for Skewness and Kurtosis test for TR are -.001724 and 1.826922, while for TP are .2671511 and 2.351179.

3.1. Unit Root Test

In order to model the variable in a manner that captures the inherent characteristics of its time-series, we determine the lag structure level of the series through using the FPE, AIC, SBIC and HQIC criteria.

Moreover, lag with the smallest value is the order selected by that certain criterion. An '*' indicates the optimal lag. Strictly speaking, the FPE is not an information criterion, though we include it in this discussion because, as with an information criterion, we select the lag length corresponding to the lowest value; and, naturally, we want to minimize the prediction error. The AIC measures the discrepancy between the given model and the true model, which, of course, we want to minimize. Amemiya (1985) provides an intuitive discussion of the arguments in Akaike (1973). The SBIC and the HQIC can be interpreted similarly to the AIC, though the SBIC and the HQIC have a theoretical advantage over the AIC and the FPE. As Lutkepohl (2005) demonstrates, choosing p to minimize the SBIC or the HQIC provides consistent estimates of the true lag order. In contrast, minimizing the AIC or the FPE will overestimate the true lag order with positive probability, even with an infinite sample size.

Furthermore, the results of the lag level in our analysis are presented in the following table:

Table 2. Determination of lag structure

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-3384.09				3.3e+13	36.8053	36.8195	36.8403
1	-3255.54	257.11	4	0.000	8.5e+12	35.4515	35.494	35.5563
2	-3230.15	50.783	4	0.000	6.8e+12	35.219	35.2898	35.3937
3	-3205.91	48.471	4	0.000	5.4e+12	34.999	35.0982	35.2436*
4	-3197.15	17.53	4	0.002	5.2e+12*	34.9472*	35.0747*	35.2617

Source: authors calculations.

The next step in this empirical section is to determine the degree of integration of both variables. The main objective of a Unit root test is to examine whether a series contains a unit root and since many macroeconomic series are non – stationary (Nelson &Plosser, 1982), then Unit Root test are expressed as very useful in determining the order of integration of the variables, by which they can provide the properties of time- series data. For implementing a rigorous examination for the presence of the Unit root in the series of public revenues and expenditures, I have adopted the Augmented Dickey Fuller (ADF) test as well as Phillips – Perron (PP) test is also employed in this section empirical analysis conduction.

The ADF and PP unit root test with intercept; with intercept and trend are adopted to check whether the variables contain a unit root or not.

The results of ADF and PP test are reported in the table 6 and 7 for the level as well as for the first difference of each of variable. The result shows that the null hypothesis that the series contain unit root cannot be rejected in both cases at zero order levels. But the hypothesis of a unit root is strongly rejected for the differenced series of both variables.

Given the consistency and ambiguity of the results from this testing approach, we conclude that the series under investigation are I (1). This reveals that both, public revenues and expenditures are non-stationary in its levels and stationary in first difference.

Table3. Results of Augmented Dickey Fuller test

Sl. No.	Variable	Intercept	Intercept & Trend
Levels	**TR**	-0.454[4] (-2.884) MacKinnon approximate p-value for Z(t) = 0.9007	-2.528 [4] (-3.438) MacKinnon approximate p-value for Z(t) = 0.3139
	TE	-1.006 [4] (-2.884) MacKinnon approximate p-value for Z(t) = 0.7509	-3.481 [4] (-3.438) MacKinnon approximate p-value for Z(t) = 0.0415
First difference	**ΔTR**	-9.047 [4] (-2.884) MacKinnon approximate p-value for Z(t) = 0.0000	-9.044 [4] (-3.439) MacKinnon approximate p-value for Z(t) = 0.0000

	ΔTE	-9.714 [4] (-2.884) MacKinnon approximate p-value for Z(t) = 0.0000	-9.688 [4] (-3.439) MacKinnon approximate p-value for Z(t) = 0.0000
***Notes**:* *† numbers in brackets represent lag length in ADF test, which is selected using the Akaike Information criterion and these numbers denote Bandwidth in PP test by applying Newey-West using Bartlett kernel.* *‡ Numbers in parentheses represent critical values at the 5% level of significance.*			

Source: Authors calculations.

Table 4. Results from Phillips – Perron test

Sl. No.	Variable	Intercept	Intercept & Trend
Levels	**TR**	-2.803 [4] (-2.884) MacKinnon approximate p-value for Z(t) = 0.0578	-3.438 [4] (-9.311) MacKinnon approximate p-value for Z(t) = 0.0000
	TE	-3.256 [4] (-2.884) MacKinnon approximate p-value for Z(t) = 0.0170	-3.438 [4] (-10.278) MacKinnon approximate p-value for Z(t) = 0.0000
First difference	**ΔTR**	-33.131 [4] (-2.884) MacKinnon approximate p-value for Z(t) = 0.0000	-33.050 [4] (-3.438) MacKinnon approximate p-value for Z(t) = 0.0000
	ΔTE	-30.514[4] (-2.884) MacKinnon approximate p-value for Z(t) = 0.0000	-30.425 [4] (-3.438) MacKinnon approximate p-value for Z(t) = 0.0000
***Notes**:* *† numbers in brackets represent lag length in ADF test, which is selected using the Akaike Information criterion and these numbers denote Bandwidth in PP test by applying Newey-West using Bartlett kernel.* *‡ Numbers in parentheses represent critical values at the 5% level of significance.*			

Source: Authors calculations.

Considering such results from Augmented Dickey Fuller and Phillips-Perron test for Unit root, we suggest thatpublic revenues and expenditures to be non-stationary in their level and stationary in their first difference, therefor Vector Error Correction model should be considered when testing the causality.

3.2. Co-Integration testing

Since the first difference series are stationary, let us examine the existence of co-integration between government revenue and expenditure. To test the co-integration or long run relationship, first we run the regression, table 5 reports the results obtained from the co-integration tests.

The ADF and PP unit root test suggests that the estimated residuals from equation 3 and 4 are stationary: thus null hypothesis of a unit-root can be rejected, meaning that there is evidence of a co-integration relationship between the series government revenue and expenditure. Having established the long run relationship by the Engle-Granger two-steps co-integration test, Johansen-Juselius procedure is used to further test for co-integration between government expenditure and revenues.

Table5. Results of co-integration test.

Johansen-Juselius co-integration test results.		
Null hypothesis	**λ_{trace}**	**λ_{max}**
r = 0	44.4434 [15.41]	44.0913 [14.07]
r ≤ 1	0.3520 [3.76]	0.3520 [3.76]
**terms in [ ] indicates 5% level critical value.*		

Source: Authors calculations.

Table 5 presents the result of the trace test (λtrace) and maximum eigenvalues test (λmax) statistics for the existence of long run equilibrium between the government expenditure and revenues . The null hypothesis of no co-integration (r=0) based on both the trace test and the maximum eignvalues test between government expenditure and revenues is rejected at (5%) level of significance and accept at r ≤ 1 for both variables, thus claim the existance of one cointegrating vector between the variables.

3.3. Granger Causality Test

The above analysis suggests that there exists a long-run relationship between government revenue and expenditure in the country. But in order to determine which variable causes the other, Granger causality Wald test is used. The Granger causality test results are presented in the following table.

Table 6. Granger Causality Wald tests results.

Equation	Excluded	chi2	df	Prob> chi2
TR	TE	13.868	4	0.001
TR	ALL	13.868	4	0.001
TE	TR	42.028	4	0.000
TE	ALL	42.028	4	0.000

Source: Authors calculations.

As shown in table 6, TR on TE and TE on TR are statistically significant at the 5% level ($p < 0.05$), implying that there is causality running from both sides. Moreover, these results imply that the null hypothesis TR does not granger cause TE and TE does not granger cause TR can be rejected at the 5% significance level. This means that higher revenue would lead to higher government expenditure. On the other hand, since TE on TR is also statistically significant at 5% level and the F statistics imply that the null hypothesis that TR does not granger cause TE can be rejected at the 5% significance level. Such results indicate that an increases in expenditure would induce higher revenue in the long run. Therefore, the study reveals bidirectional causation between public revenue and expenditure in Republic of Macedonia, which is running from revenue (TPR) to expenditure (TPE) and vice a versa.

Above findings lend support to the fiscal synchronization hypothesis, implying that government of Republic of Macedonia has to make its revenue and expenditure decisions simultaneously, thus will have to reconsider the fiscal deficit policy which is maintain the last several years.

3.4. Vector Error Correction Model (VECM)

The vector Error Correction Model (VECM) is used to generate the short run dynamics. The number of lags in the model is four lags.

By giving a simple AR (1) process as the following:

$$y_t = py_{t-1} + \delta x_t + \varepsilon_t \quad (1)$$

Where: y_t - time series (in this case, Public revenue and Public expenditure), x_t - optional exogenous regressors (such as constant or a constant and a trend) p and t - parameters to be estimated; ε_t - white noise error component.

In this equation, the standard DF is implemented through Ordinary Least Squares (OLS) estimation of the above AR (1) process when we already subtract the term (y_{t-1}) at both sides of equation. Therefore, this will lead to the following first difference equation:

$$\Delta y_t = a y_{t-1} + \delta x_t + \varepsilon_t \quad (2)$$

where: Δ - first difference operator, a= p-1 and ε - error term with zero mean and constant variance.

So, if we adopt now a simple t - test and if α = 0 (i.e. if p=1), then it implies that (y) is a non-stationary series and its variance increases within time. Under these circumstances, the series is said to be I (1), requiring once to be differenced to achieve its stationary. Anyway, if series are correlated at higher order lags, then the assumption of ε - white noise error in this case is violated. Therefore, Augmented Dickey Fuller (ADF) test present a possible solution for this problem: permits the correction of higher order correlation through employment of lagged differences of the series (y_t) among its regressors. Thus, ADF test de facto "augments" the traditional Dickey Fuller test, assuming that (y) series is an AR (p) process and, through including (p) lagged difference terms of dependent variable to the right side on the above equation for first difference. By this we can get the following equation:

$$\Delta y_t = a y_{t-1} + \delta x_t + \sum_{i=1}^{p} \Phi \Delta y_t + \varepsilon_t \quad (3)$$

Moreover, both cases, constant and linear trend are both included, since this represents most general specification form.

For investigating the causality between the series of Public Revenues and Public Expenditures by applying the Error Correction Model, it is necessary to verify whether two series are co-integrated or not. Indeed, we claim that two or more variables are co-integrated if they share a common trend. Thus, when the series are linked by a long-run equilibrium relationship, which relationship can deviate in the short-run but still have or must return to it in the long term and therefore with other words we can say that they exhibit same stochastic trend (Stock and Watson, 1988). Expressed it differently, Co-integration is considered as one exception to the general rule that states, if two series are both I (1), in that case any linear combination of them will yield a series integrated in a lower order, that de facto means that common stochastic trend is cancelled out, which will lead to something that is not spurious but has some significance in economic terms. Moreover, the existence of a co-integration relationship between the series of public expenditures (TE) and public revenues (TR) it has been verified through

implementing a unit root Augmented Dickey Fuller and Philips Perron test for residuals from two long-run regressions between levels variables:

$$\mathrm{TR} = \beta 0 + \beta 1 \mathrm{TE} + \varepsilon \quad (4)$$

$$\mathrm{TE} = \beta 0 + \beta 1 \mathrm{TR} + \varepsilon \quad (5)$$

In co-integration theory, regressions of the above equations are known as co=integrating regressions, while β0 and β1 and the slope parameters represent the co-integrating parameters (Gujarati & Sangeetha, 2007). But apart from Engle – Granger technique, Johansen and Juselius even is considered a better one due to the context of a two variable as well as it gives better properties of a small sample because permits feedback effects between the variables. Moreover, Johansen technique let us investigate the existence of non-unique co-integrating relationships at cases with more than two variables. Indeed, this technique represents a test of the rank of the matrix Π. Moreover, when we deal with two non-stationary series, in this case co-integration requires that the matrix Π not to have full rank thus 0 < r (Π) = r < n, where r represents the number of co-integrated vectors. Based on the Likelihood ratio test (LR) we use two suggested tests statistics in order to determine the number of co-integrated vectors: trace test and maximum eigenvalues test.

Thus, trace test can be estimated through the following equation:

$$Trace = -T \sum_{i=r+1}^{\Pi} \log(\lambda) \quad (6)$$

According to trace test, null hypothesis claim that the number of co-integrating vectors is ≤ r while alternative hypothesis state that the number of c0-integrating vectors = r.

On the other side, the maximum eigenvalues test ($\lambda \max$) can be expressed as:

$$\lambda\, max = -T \log(1 - \lambda) \quad (7)$$

In this case, null hypothesis claims that the number of co-integrating vectors = r while the alternative hypothesis is that the co-integrating vectors are r+1.

After accomplishment the testing of co-integration, we move to establishing the evaluation of the causal relationship between public revenues and expenditures through the implementation of the Error Correction Model (ECM). Causality in the analysis it assumes a different meaning toward more common use of the term, based on the standard of Granger (1969). Indeed, the claim that government expenditures granger causes government revenues and vice a versa represent how much of the current government expenditures and government revenues

can be explained through the past values of government expenditures and government revenues as well as estimating whether adding lagged values of government expenditures and revenues can improve such explanation. Taking these facts into account, the analysis of causal relationship can be established by using the following two regressions:

$$\Delta TR_t = \beta_0 + \sum_{i=0}^{m} \beta_{1i} \Delta TR_{t-1} + \sum_{i=0}^{n} \beta_{2i} \Delta TE_{t-1} + \varepsilon \quad (8)$$

$$\Delta TE_t = \beta_0 + \sum_{i=0}^{m} \beta_{1i} \Delta TE_{t-1} + \sum_{i=0}^{n} \beta_{2i} \Delta TR_{t-1} + \varepsilon \quad (9)$$

Taking account these two equations, m represents the lag length which indeed should be set to be equal to the longest time period for which one series in this case might reasonably help to predict the other series variable. This approach predicts the null hypothesis that claim that Government expenditures does not granger cause government revenues in the regression equation (8), and that Government revenues does not granger cause Government expenditures in the regression equation (9) that should be tested by using the implementation of a simple F – test for the jointly significance of β1i and β2i. By following the above regression equations, where estimated using lags of every variable in order to represent the adequate lag length in order one series to predict the other, where in this case government revenues and expenditures are used as variables.

From Johansen – Juselius testing, since variables in the VAR system are co-integrated, we use the Vector error correction models, to estimate the speed of the adjustment of the deviation in the long term equilibrium among Government revenues and expenditures. Moreover, the vector error correction model can be established through usage of the following equations:

$$\Delta TR\,t = \beta 0 + \sum_{i=1}^{m} \beta 1i \Delta TR\,t-1 + \sum_{i=1}^{n} \beta 2i \Delta TE\,t-1 + \beta 3i\,\eta t-1 + \varepsilon \quad (10)$$

$$\Delta TE\,t = \beta 0 + \sum_{i=1}^{m} \beta 1i \Delta TE\,t-1 + \sum_{i=1}^{n} \beta 2i \Delta TR\,t-1 + \beta 3i\,\mu t-1 + \varepsilon \quad (11)$$

Where μ_{t-1} and η_{t-1} in these cases represent the error correction term lagged residual from the relations of co-integration process. Moreover, the above error correction terms capture the speed of adjustments in the short run into the long run equilibrium. The above error correction model equations (10) and (11) also allow us to test causality between government expenditure and revenues in the short run as well as in the long run, where the short run causality is realized through standard F-test statistics in order to evaluate the jointly significance of the coefficients of their explanatory variables during their first differences. On the other side, the long run causality testing it is based by using a standard t-test. Furthermore, negative and statistically significant values of the coefficient of the

vector error correction model emphasize the existence of the causality in the long run.

Further, Table 6 reports the results of vector error correction model. The findings from VECM are similar the ones resulting from the application of standard Granger Causality test, which means that evidence of bidirectional causal relationship in Macedonia results from data.

Table5. Vector error correction results

Regression	ΔTR	ΔTE
η_{t-1}	-1.503722	
μ_{t-1}		-1.575163
ΔTR_{-1}	0.144 (1.46)	0.000 (10.63)
ΔTE_{-1}	0.000 (6.69)	0.000 (-4.93)
R^2	0.7763	0.6337
S.E	.0349317	.0589984

(terms in brackets are t – ratios).
Source: author's calculations.

In the table5, error correction models estimations are represented, where error terms η_{t-1} and μ_{t-1}, in both equations are negative and statistically significant at 95% level of significance, indicating the existence of bidirectional causality between public expenditures and revenues in the long- run. The value of η_{t-1} indicates the speed of adjustment of any disequilibrium towards a long-run equilibrium, thus the percent of the disequilibrium in TR that is corrected each year, while the value of μ_{t-1}indicates the speed of adjustment of any disequilibrium towards a long-run equilibrium, thus percent of disequilibrium in TE that is corrected each year. In addition, the significant error terms in both equations support the existence of a long run equilibrium relationship between TR and TE. Furthermore, VECM indicate the existence of bidirectional causality running between TR and TE. Moreover, findings of VECM emphasize the bidirectional Granger causality between public revenues and expenditures which consists with the fiscal synchronization hypothesis.

4. CONCLUSIONS AND RECOMMENDATIONS

The paper investigated causal relationship between public expenditures and public revenues in the case of Republic of Macedonia, conducted through monthly data for the time period from 2000 to 2015, by using Granger causality and Vector Error Correction Model (VECM) tests methodology. Data properties were analyzed to determine their stationary by using Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) test for unit root, showing that both variables are non stationary at their level and stationary at first difference. Additionally, in order to test the causality between the series of public revenues and public expenditures, it's necessary to verify if the two series are co-integrated therefore Johansen test for co-integration was implemented, resulting the variables to be I(1). Moreover, for modeling variables in a manner that conquest in severable characteristics of its time series, we use AIC, SIC and HQIC to properly define lag structure of the series, resulting the optimal lag order to be four. The next step implemented the Granger Causality test, implying the existence of bidirectional causality running from public revenues to expenditures and vice a versa. Moreover, VECM model was used to investigate the long run and short run relationship between these two variables in Republic of Macedonia. Moreover, findings emphasize that due to negative sign and its statistical significance at 95% level of error terms of both variables there exist a long run causal relationship running in both directions, from revenues to expenditures and vice a versa. Moreover, bidirectional causality is also seen during short run, thus findings are in line with fiscal synchronization hypothesis.

Findings are in line with those of Al-Zeaud (2014), AbuAl-Foul and Baghestani, (2004), Gounder et al., (2007), Aslan and Taşdemir, (2009), Chang and Chiang, (2009) and Chang et al., (2002) for Canada, regarding the bidirectional causality running between government revenue and government expenditures. Finally, our paper lifts important suggestion for policymakers that Republic of Macedonia is a small open economy where impositions of taxes are decided on basis of allocated government expenditures. However, public expenditures positively induce revenues by affecting also the current expenditures and those of next fiscal years. Indeed, the existence of bidirectional causality between public expenditures and revenues might complicate the effort of state to control budget deficit in Republic of Macedonia.

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STRUČNI RADOVI

EXPERT PAPERS

POSSIBLE APPROACH TO MODERNISE STATISTICAL SYSTEM OF BOSNIA AND HERZEGOVINA

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Rezime

National statistical institutes (NSIs) are currently facing many challenges: competition against the many producers of statistics, the emergence of new data ecosystems, and mounting pressure for cost-effectiveness and timeliness. In order to gain a sustainable competitive advantage, NSIs need to modernize their processes and technologies, increase skilled resources, tools, methods and standards, and adopt the best solutions to meet new demands. In process-oriented organizations the focus is on business processes and the improvement of interdepartmental and cross- functional interactions, with the goal of optimizing the execution of the whole procedure through a thorough understanding of end-to-end processes and the production system as a whole. One of the international standards supporting this modernization process is the Generic Statistical Business Process Model (GSBPM). Moving away from the current traditional state toward a more process-oriented organization is a complex, time-consuming and costly effort, but the adaptation of international standards for business processes and the establishment of a coherent system would make NSIs more efficient in comparing and integrating international best practices and standards in the methodology, quality and IT fields, as well as in identifying further needs for harmonization and development. Modernization takes time, so even those NSIs which are the most committed to streamlining the processes have not yet fully completed statistical workflow management systems, end-to-end standardization and the automation of statistical processes. This paper focuses on elaborating the possible approach to the modernization of the statistical institutes of Bosnia and Herzegovina through the implementation of the following steps in its statistical institutes:
(1) initiation of a strategy and a project, mandated to propose and implement activities for the GSBPM establishment; (2) assessment of the current situation in terms of the establishment of the GSBPM, (3) development of a template for the detailed methodological descriptions and applications for all subject matter domains, (4) adoption of a tailor- made GSBPM, (5) development of an IT tool to support the workflow, process management and monitoring, which includes (5.1) development of an IT tool that will unify/standardize the processing phases of the statistical process, (5.2) development of an IT tool for automation of the maintenance, and (5.3) the development of an IT tool for the monitoring of the whole standardization and automation processing, (6) preparation of detailed GSBPM-based process documentation, (7) establishment of a GSBPM-based metadata system, (8) establishment of a GSBPM-based quality management system.

The modernization process in a few countries will also be briefly mentioned.

Keywords: business process management, process-oriented approach, GSBPM, standardization, automation

1. Introduction

Statistical production has traditionally been product-oriented, meaning organized by topic or subject-related aspects, i.e. labor force, industry, trade, etc., having stovepipe production where each survey has its own production system and there is little coordination between them. In this stovepipe model, it is often difficult to reuse procedures that are similar from survey to survey and to integrate data from different surveys, even though the processes of production are similar and comparable. Generally, this amount of individual methodical and technical solutions causes high costs for the development of statistics as well as greater respondent burden since, for example, similar variables are collected multiple times. Over time, this approach to processing statistical data has been improved, usually in the frame of a single subject-related stovepipe, for example through the standardization of some processes (i.e. editing rules) or the use of automated solutions for some processes (i.e. editing, imputation, evaluation, etc.). National statistical institutes (NSIs) have often identified, on their own initiative, similar parts of the production processes and tried to optimize them by standardizing tools, methods, and/or instruments, etc., according to their individual means and possibilities. Thus, repetitions of similar procedures, methods or tools for each survey production process are inevitable.

But, today's NSIs face many challenges, such as competition from other (private) producers of statistics, increasing demands in statistics production (cost-effectiveness and timeliness), changing technologies (new data ecosystems - big data), decreasing budgets, etc. These factors force producers of official statistics to invest in IT infrastructure, improvements to the production process and staff with more knowledge and skills. Namely, in order to gain a sustainable advantage over other producers of statistics, NSIs need to modernize their processes and technologies, increase skilled resources, tools, methods and standards, and adopt common solutions to meet new demands.

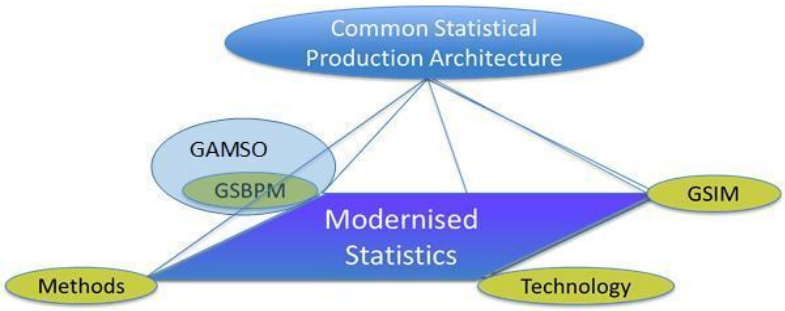
The key area 4 of the European Statistical System (ESS) Vision 2020 states that the ESS will intensify the sharing of knowledge, experiences, methodologies, tools, data, services and resources where appropriate, based on agreed standards and common elements of technological and statistical infrastructure (domain- independent standard processes, metadata-driven business chains and service-oriented data-based outputs of statistical processes), and will adopt enterprise architecture as a common reference framework. (ESS Committee, 2014) In response to this, many statistical organizations have been moving towards a process-based approach. In this approach, the focus is on business

processes and the improvement of interdepartmental and cross- functional interactions with the goal of optimizing the execution of the whole process through a thorough understanding of end-to-end processes and production system as a whole. (ECE, 2015) Moving from the current traditional status quo to a more process-oriented organization is a complex, time-consuming and costly effort. (ECE, 2015) It takes time and requires investments in machines, tools and labor. But, the adaptation of the business processes to international standards and establishment of a coherent system will make the NSIs more efficient in comparing and integrating international best practices and standards in the methodology, quality and IT fields, as well as in identifying further needs for harmonization and development.

One of the international standards supporting this modernization process is the Generic Statistical Business Process Model (GSBPM). It was developed during the Joint UNECE/Eurostat/OECD Work Session on Statistical Metadata, and its original purpose was to provide a standard terminology to be used regard ing metadata and statistical processes.

The Common Statistical Production Architecture, as the reference architecture for the statistical industry, developed and peer reviewed by the international statistical community, covers statistical production across the processes defined by the GSBPM, provides a practical link between conceptual standards (the GSBPM and the Generic Statistical Information Model - GSIM) and statistical production. It also includes application architecture and associated principles for the delivery of statistical services as well as technology architecture and principles (limited to the delivery of statistical services); but, does not prescribe technology environments of statistical organizations. (UNECE)

Figure 1. Relationship between GSBPM and the Common Statistical Production Architecture



Source: http://www1.unece.org/stat/platform/display/GAMSO/Purpose

The GSBPM is a flexible, comprehensive model that defines and describes the set of business processes needed to produce official statistics, comparing and benchmarking them within and between organizations, while also organizing the resources accordingly, and sharing methods and components. The GSBPM recognizes several overarching (transversal) processes that apply across the statistical business process, where the most relevant overarching processes are quality and metadata management. (UNECE)

The Bureau of the Conference of European Statisticians conducted an in-depth review of the process-oriented approach to statistical production at its meeting in February 2015. In order to evaluate NSIs' approaches to process-oriented statistical production and include the findings in this in-depth review, Statistics Turkey (TurkStat) undertook a survey in November 2014. Here are some findings of this survey regarding the impact on products, production and work culture:

- The Australian Bureau of Statistics' (ABS) movement toward a process-oriented approach enabled the production of more statistical products. Savings were made with regard to production. It became more feasible to manage the transition to updated technology within the statistical process, such as e- forms. Staff had less manual tasks that were excessively detailed and routine, and had more time available for higher level tasks, such as analysis and innovation. Compared to stove-piped working arrangements in the past, there was more emphasis on different parts of the organization working together in practice to achieve results.

- Statistics Canada increased specialized expertise in collection, processing (business/social), IT, and operations. This allowed subject matter experts to focus on analysis in their area of expertise rather than operational activities. Being more efficient saved financial resources, which were then reinvested in the organization's programs and quality maintenance.

- Statistics Finland introduced changes in the work and planning processes through a more centralized approach. Staff improved their understanding of the ongoing work in other units.

- Statistics Norway improved quality across domains using the same process and introduced more meetings (physical and/or virtual) and documented routines for cross-cutting processes.

- In TurkStat, the data production and dissemination systems were

standardized and new systems were built. All business surveys and most household surveys moved to a new data collection environment (Data Documentation Initiative (DDI)-based IT tool), so that all surveys would use the same IT tool for data collection. Metadata was standardized and maintained in one place. As a result of these standardizations and new systems, the timeliness and effectiveness of the data collection process improved, and process metadata became available for the creation of new reports for senior management to help with their decision- making. (ECE, 2015)

To summarize, NSIs reported many significant benefits as a result of developing a process-oriented approach to statistical production. The increased standardization helped reduce costs, allowed subject matter experts to focus on analysis rather than operational activities, reduced routines, and improved timeliness and effectiveness of data collection. The financial resources that were saved could be more efficiently reinvested in the organization's programs to maintain the required range of statistical products and improve quality across statistics. The change helped to develop process phase-specific skills, e.g. IT skills that make the transition to updated technology more feasible. (ECE, 2015)

The statistical institutes of Bosnia and Herzegovina (B&H) (Agency of Statistics of B&H (BHAS) at national level; Federal Institute for Statistics of B&H (FIS) and Republic of Srpska Institute of Statistics (RSIS) at entity level) adopted GSBPM (v4.0) as a part of their strategies toward the development of a metadata system within the statistical system of B&H in 2013. Although the general commitment is to follow and adapt the GSBPM to the national context, the statistical production process remains more product-oriented with a strong burden on IT and Methodology departments, and no specific steps toward the improvement of business process management have been taken.

This paper presents the structure of a possible approach for the establishment of one of the main pillars for the modernization of the statistical system of B&H: adaptation and implementation of the GSBPM (v5.0) in the statistical system of B&H.

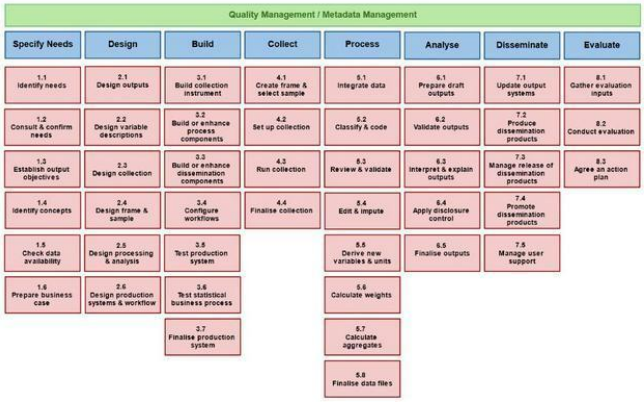
2. Overview of Various National Statistical Business Models in Place

The GSBPM is used by more than 50 statistical organizations worldwide to manage and document statistical production. A national statistical business model is just a representation of reality that varies from organization to organization. (UNECE)

Below are graphically presented the generic GSBPM and some national representations of it, in order to provide a quick overview of the overlapping elements and/or differences.

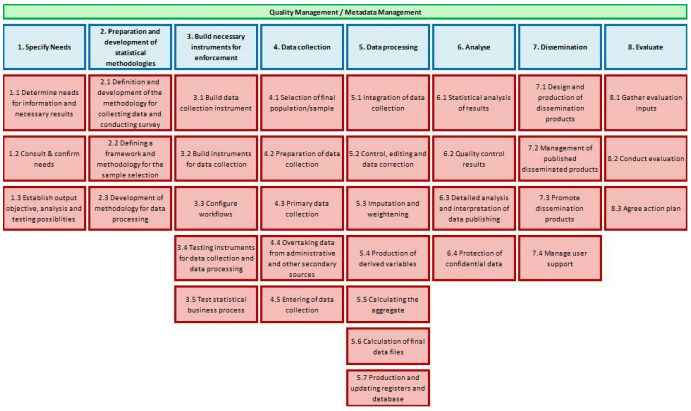
The examples used are the national GSBPMs of the statistical offices of countries with which the statistical institutes of B&H share some commonalities, in the sense of similar conditions, infrastructure, and processing activities, support in the development of various statistics processes, etc. (Hungary, Croatia, Sweden, Germany, Turkey).

Figure 2. GSBPM v5.0



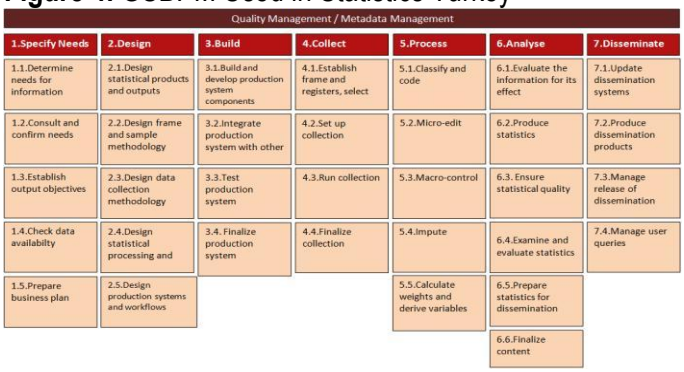
Source: http://www1.unece.org/stat/platform/display/GSBPM/IV._Levels+1+and+2+of+the+Generic+Statistical+Business+Proce_ss+Model

Figure 3. GSBPM Used in Statistics Croatia



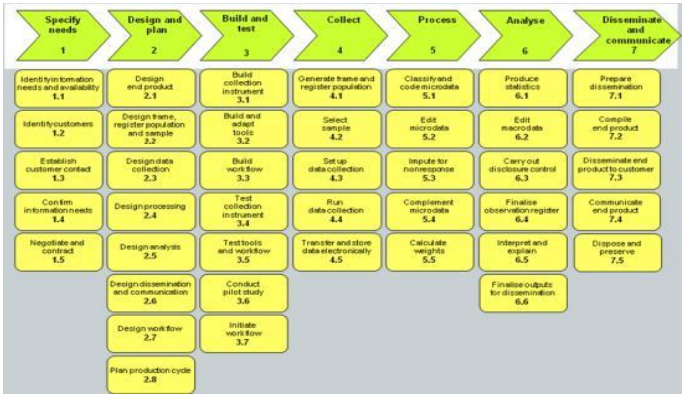
Source: http://www1.unece .org/stat/platform/pages/viewpage.action?p_ageId=107414814

Figure 4. GSBPM Used in Statistics Turkey



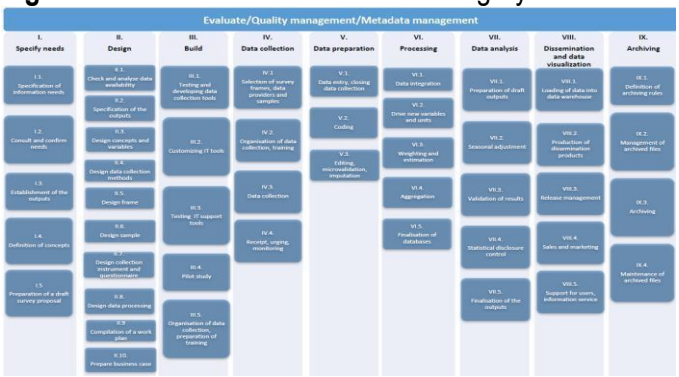
Source: *http://www1.unece.org/stat/platform/display/CASES/Turkish+Statistical+Institute%3A+use+of+GSBPM*

Figure 5. GSBPM Used in Statistics Sweden



Source: *http://www1.unece.org/stat/platform/pages/viewpage.action?p_ageId=107414838*

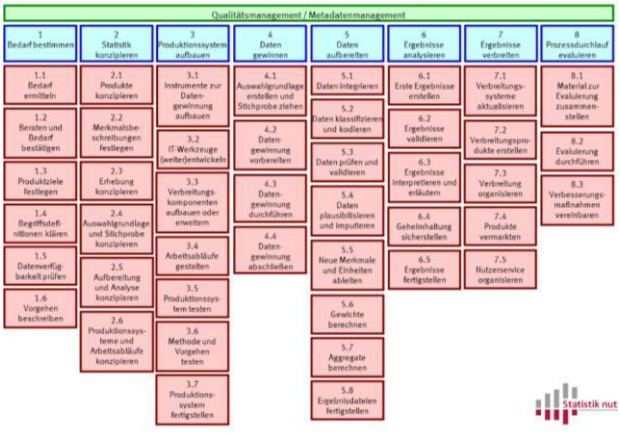
Figure 6. GSBPM Used in Statistics Hungary



Source: *http://www.q2014.at/fileadmin/user_upload/Paper_Improving*

_the_Quality_Management_System_Projects_at_Hungarian_
Central_Statistical_Office_Szekeres_Mag_Abry_Nagy_Verecz_kei_final.pdf

Figure 7. GSBPM Model Used in Statistics Germany



Source: https://www.statistik .rlp.de/ueber- uns/qualitaet/geschaeftsprozess

Each of these national models has its own specificities at the first two levels (the specific activities in each of the sub-processes are not analyzed). Among the specifics, it can be seen that the German GMAS is completely identical to the GSBPM (at least at the first two levels), and that only the Croatian national interpretation has the *Evaluate* process. The Hungarian ESTFM has the *Archive* process, which was in the older versions of the GSBPM but has since been removed due to the fact that archiving is present throughout all sub-processes, and is also the only one which has *Evaluate* as the overarching process together with quality and metadata management. Furthermore, some additional specifics of interest can be noticed, such as: in the Hungarian ESTFM the *Specify needs* process has one sub-process less than the GSBPM – the sub-process *Check data validity*; the *Design* process is more detailed than in the GSBPM – has more sub-processes; the *Process* process is split into two processes – *Data preparation* and *Processing*; the *Data analysis* process has one additional sub-process – *Seasonal adjustment* – but no *Interpret and explain outputs* sub-process; one sub-process *Organization of data collection, training* is a part of two processes – *Build* and

Data collection – with the difference that in the *Build* process this sub-process includes only a preparation of training, while the *Data collection* process includes the implementation of the training. The Croatian GSBPM has a much "shorter" *Build* process (fewer sub-processes), but has one new sub-process in the *Data*

collection process – the *Overtaking data from administrative and other secondary sources*. The Swedish GSBPM has a *Process* process that is much "shorter", but therefore the *Design* process is much more detailed than the GSBPM, while the Turkish GSBPM has fewer sub-processes in the *Build* process, no *Integrate data* nor *Calculate aggregates* in the *Process* process, but instead has a sub-process *Produce statistics* in the *Analyze* process. Additionally, The Turkish GSBPM does not have the

Promotion of dissemination products sub-process in the *Disseminate* process. This is just an insight, but generally a detailed analysis of different national interpretations is useful in the creation of one's own national interpretation.

3. Modernization of the Statistical System of B&H

3.1. Rationale

The most important factor for the successful implementation of process management is the capability of NSI management to organize and manage the individual components of the system – the IT (information technologies) department, the subject matter departments, the methodologists, business analysts and others involved in the production process. (ECE, 2015) It is essential that the NSI has a vision, strategy and strong commitment from the top management to move in that direction, and with a long-term perspective.

For many NSIs, moving in this direction was/is a kind of revolution, requiring changes to the mindset of the staff. The employees are usually skeptical towards business process management; mainly because they worry that their established working procedures will be examined and changed as a result. Such a change is often perceived as a risk and a deterioration of quality. Thus, such changes cannot happen without setting comprehensive process improvement as an important strategic goal, and without continued support as well as the prioritization of resources and input from top management down. (Lüüs, 2012)

The ESS has integrated its key quality principles into the European Statist ics Code of Practice (CoP) - a comprehensive quality approach, which defines the quality indicators of European statistics in terms of the institutional environment, statistical processes and outputs. The CoP is accompanied by the ESS Quality Assurance Fra mework (QAF), which is a repository of best practices and tools to guide the implementation of its different indicators.

The key principle in achieving efficient and robust statistical processes is to adopt enterprise architecture, which provides a stylized description of the core aspects of a statistical enterprise (or system) and its interrelations, such as the GSBPM. (ESS Committee, 2014) The common vision of the statistical institutes of B&H is to become recognized as institutions that provide high quality, timely and relevant statistical information. The main guidelines in fulfilling this commitment are adhering to the CoP principles and using the GSBPM for improvements to the institutional environment, processes and products.

The great benefits of the adoption of the GSBPM are that the processes are designed and described according to a unified and generic logic, which increases transparency and comparability of processes used, seeks to eliminate wastes and duplicates, contributes to the QAF and identifies the responsibilities of the statistical units and the interactions of sub-processes. (Szekeres, Nagy, Ábry, Mag, Vereczkei, 2014) The GSBPM should be applied and interpreted flexibly. It is not intended to be a rigid framework in which all steps must be followed in a strict order. It is simply a model that identifies the steps in the statistical business process and the inter-dependencies between them. (UNECE) It is organized into three levels: Level 0 - the statistical business process; Level 1 - the eight phases of the statistical business process; and Level 2 - the sub-processes within each phase (a description of those sub-processes). (UNECE) Although the presentation follows a logical sequence of steps in most statistical business processes, the elements of the model may occur in different order in different circumstances, as already seen in the examples of national interpretations in previous section. According to process modeling theory, each sub-process should have a number of clearly identified attributes, including: input(s), output(s), purpose (value added), owner, guides (i.e. manuals and documentation), enablers (people and systems), and feedback loops or mechanisms (i.e. quality indicators and evaluation). (UNECE) The types of data sources used or the outputs to be produced can influence some elements of the GSBPM being more relevant for one type of process than for another (i.e. use of administrative sources will make the *Data collection* process less in focus than the specific sub-section on the *Integration of the data*, while in the continuous Labor Force Survey business process description this might be the opposite). Some elements might overlap and/or form iterative loops (i.e. validation and editing of data). It can even happen that the national implementations of the model would need additional sub-processes (i.e. if the NSI uses a lot of administrative and/or secondary sources, an additional sub-process that deals with overtaking data from administrative and other secondary sources should be included).

The following steps should be taken in the statistical institutes of B&H in order to modernize their statistical production processes: (1) Initiation of a strategy and a project, mandated to propose and implement activities for the GSBPM establishment; (2) Assessment of the current situation in terms of the establishment of the GSBPM; (3) Development of a template for detailed methodological descriptions and applications for all subject matter domains; (4) Adoption of the tailor-made GSBPM; (5) Development of an IT tool that supports workflow, process management and monitoring, which includes : (5.1) development of an IT tool that unifies/standardizes the processing phases of the statistical process, (5.2) development of an IT tool for the automation of maintenance, and (5.3) development of an IT tool to monitor the standardization and automation processing; (6) Preparation of detailed GSBPM-based process documentation; (7) Establishment of a GSBPM-based metadata system; and (8) Establishment of a GSBPM-based quality management system.

These steps are closely related to each other, but entail different detailing when it comes to the level of identification of quality requirements and documentation, and do not necessarily have to be in this order.

3.2. Initiation of a Strategy and a Project

Modernization takes time, and even those NSIs fully committed to streamlining their processes have not yet fully completed the development of statistical workflow management systems, end-to-end standardization and the automation of statistical processes. (ECE, 2015) NSIs are commonly brought to adapting the GSBPM to their national context while planning projects that would improve their quality management system, improve efficiency and transparency and realize a better harmonization with international and national standards and with relevant CoP principles. In order to avoid the time lag due to planning projects for which the follow- up might be the adaptation of the GSBPM, it would be advisable to plan and implement a whole project dedicated strictly to this process and its implementation strategy, including: a description of clear goals, which have to be transparent and understood by all members of the project team, management and possible project sponsor(s); feasible goals regarding cost, time and quality; a detailed project plan, which contains the whole process, milestones, timetable, possible risks, expected results and their effects, structure of the project team, tasks and responsibilities, resources, budget and communication plan; commitment of the organization and management; continuous and clear communication within the project team and towards the statistical institutes (i.e. e-mails, meetings, calls, etc.); and the involvement of different departments in the

project (i.e. IT department, subject matter departments, methodologists department, etc.).

The thorough undertaking of analyzing statistical business processes in connection with future IT development should result in a prepared exhaustive strate gy, explaining what aims are to be achieved in the project. Every step and procedural detail should be carefully planned, before being implemented and monitored.
In the *Strategy of Development of Statistics of B&H 2020* (further in text called

Strategy), the statistical institutes of B&H agreed, among others, on the strategic priority number 5: "Optimization of processes and tasks in the statistical production process". The activities within this priority are:

- Setting priorities with regard to statistical surveys and providing adequate financial resources;

- Optimization of the process and ensuring efficient information support; and

- Optimization of internal organizational structure and management of staff resources. The processes were planned to be optimized via: a) the optimization of the organization of data collection from reporting units and administrative sources, and the development of new and efficient ways to collect data using contemporary electronic communication tools (e-questionnaires, data delivery using web applications, use of computers in surveys involving households); b) the optimization of procedures for the selection of units observed by introducing coordinated sampling (thus reducing the burden on reporting units); c) the standardization of the process of statistical data editing; and d) the use of a statistical business register as a common frame used to extract samples for business statistics. (FIS, 2013)

A plan of mitigation measures for avoiding or dealing with risks, obstacles, threats, and for obtaining the desired results/deliverable should be prepared as well. This project would include the activities listed in the strategic priority number 5, and would further provide not only a modern foundation for the production and delivery of high quality, relevant, up-to-date and timely B&H statistics, but would also enable the establishment and implementation of many overarching systems and processes, such as the GSBPM-based metadata system and the GSBPM-based quality management system. In all phases, from requirements to

deliverables, the focus should be on permanent evaluation, and evaluating the iterations of separate processes and sub-processes with regard to these aspects: current state- of-the-art, reasons for change and differences between past and present/future plans, implementation process and issues encountered, critical success factors, present status of the projects, way forward, etc.

A project designs and implements organizational structure through clearly defined processes, roles, responsibilities and relationships in order to direct, manage and control the process, resources and information and to achieve goals that are linked to statistical strategy and objectives. ICON-INSTITUT (http://www.icon- institute.de/) supports its clients in the implementation of tailor-made and hands-on solutions in a timely and cost-effective manner by providing them with the knowledge and capacities to achieve and ensure tangible, long-lasting and sustainable results and impact, covering the full project life cycle, from initial study and concept development to design and planning, monitoring of implementation and evaluation with regards to specific technical assignments or global management tasks with interdisciplinary and integrated approaches. Through decades of experience, ICON realizes the importance of strategy and project design for the successful implementation of each and every one of the projects.

In most of the NSIs that have been working on the imp lementation of the GSBPM in their business process, a working group (WG) - sometimes even a new department - has been established. It is advisable that the statistical institutes of B&H also establish a WG, which would centralize most of the methodology and IT staff as well as some subject matter specialists and analysts from all three statistical institutes of B&H. Middle- management should be a key component of the WG, since they are responsible for survey processes and are in constant contact with the survey implementation staff, sharing information and guidance related to the approach. Since changes of this nature must be supported by centralized information and communication, emphasized by daily contact, the middle- management has to be prepared to take on this responsibility. This WG would develop and improve the overall production framework and facilitate long-term development initiatives; it would also be responsible for ensuring that the appropriate statistical production processes are in use by providing the methods and tools, documentation, support and training for the processes as well as by continuously evaluating and improving these processes. A corresponding working group in the State Statistical Office of Macedonia (SSO) was chaired by the Deputy Director General. The fact that the Director General is the leader of the WG highlights the commitment of the

statistical institution to the modernization of the national statistical system in line with international and ESS standards. (Novkovska, Papazoska, Ristevska-Karajovanovikj, 2012) The WG should be tasked with delivering the first version of the national GSBPM within a tight time frame, in order to eliminate the real danger of falling into lengthy, pointless discussion, with no value added, on details of how to define and label the processes and sub-processes of the model. The progress of implementation should continuously be controlled.

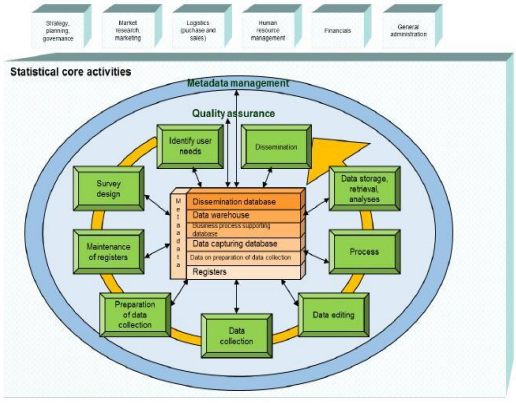
It is necessary to organize trainings and workshops at different levels in order to discuss the national model and the benefits of its implementation, to make staff aware of how their everyday work fits within that model and to familiarize staff with their obligations within the relevant phases/sub-processes/activities of the model. Since study visits represent an effective type of activity for the transfer of knowledge and standards, it would be advantageous to conduct study visits to those countries which have done great work on the common statistical production architecture with help from the GSBPM.

3.3. Assessment of the Curre nt Situation in Terms of Establis hment of the GSBPM

One of the first steps in becoming a more process-oriented organization is to identify and document the processes within the organization. Therefore, it is necessary to do a mapping of the current processes in the statistical institutes of B&H and the convergence level towards the GSBPM.

Generally, the production of official statistics is a complex chain of operations.

Figure 8. Activities of the Statistical Organization



Source: Quality Guidelines for the Statistical Processes of the Hungarian Central Statistical Office

It starts with an investigation about information needs, in terms of results or outputs, of various users, their filtering and subsequent bundling in such a way that one activity generates results, fulfilling a number of user needs and not exclusively targeting one user group. These information needs have to be translated into the best way of collecting data from respondents, through statistical surveys and censuses or through the use of administrative or similar data collected outside the statistical system. The programming phase can be iterative, since it involves the balancing of needs with available resources and priority setting. Once the statistical objects and sources for obtaining information have been determined, the statistical survey (or administrative or similar data) allocated to be used has to be designed/redesigned and tested, and the tools and resources necessary for its full implementation prepared and/or adjusted if necessary. In this design phase, the results to be published as official have to be defined. In the case of statistical surveys, the data collection phase is a crucial part in the design of operations that are under the responsibility of statisticians. For statistical surveys, the data collection phase itself is a key phase in terms of management and use of NSI resources. In the case of administrative or similar data, this phase is outside the statistical system, but carries the same weight; therefore the statisticians should be consulted in the process of decision-making about the data structure and content. In the case of the use of administrative or other sourced data, it is also necessary to maintain statistical data registers of different kinds (business, real estate, persons, farms, etc.). The processing phase includes data entry, control, coding, editing and imputation, as well as matching data with other sources, and the aggregation or extrapolation (including possible calibration) of data to the pre-defined official results, including the necessary quality parameters such as i.e. standard errors and/or coefficient of variations. This phase is very IT-dependent and if CATI (computer assisted telephone interviewing) or similar computer assisted techniques are used during the data collection phase, some of the processing activities can be already applied during the data collection phase. The statistics/results and quality parameters have to be carefully analyzed by, for example, integrating or at least systematically comparing data from other sources or other series about the same phenomenon. The dissemination phase is more than the release of the results in various forms; it may include subsequent publications with more detail or analytical content (typical for censuses of population, households and dwellings), or for specific user groups (for example, specific ministries or banks), and it includes the generation of additional results for specific user requests (for example, researchers). Prior to this, the final set of micro-data has to be stored and well-documented for a considerable period. The whole statistical production process has to be constantly evaluated in order to identify and address possible

improvements in efficiency and quality, so that they can be either included in the next wave or considered during the next systematic programming. In addition to the production processes, a statistical system includes a number of support and cross-cutting processes, which address resources and the statistical infrastructure: human resources management and a carefully designed IT infrastructure targeted to the tasks of official statistics production. (UNECE, Statistics Division, 2008)

The optimization of the processes in a stovepipe production suffers from many limiting factors, such as: it is resource-demanding (human, tools and time) to develop, maintain and document all the specific surveys, specific systems and tools, and usually this is never done completely (i.e. proper documentation is often missing due to the repetition of activities by same staff); it is difficult and very slow-paced to implement new and improved methods and tools, since they need to be tailor- made for each survey (i.e. evaluation methods using specific statistical software); many different systems result in an (unwanted) variation in quality which is sometimes not possible to describe and/or control adequately (i.e. for some surveys standard error is measured and for others not, without an explicit rationale); changes in individual surveys are too often driven by the competence of the specialists available at the production unit (very often IT specialists or methodologists), while subject matter specialists are very often busy with logistic and operational aspects; common problems are often solved in different ways in different stovepipes. For the common approach to optimization and development of all activities in the statistical business process, any model would fit, if it captures the majority of the activities under the phases mentioned above and establishes a common and stable framework which the organization can rely on. (Bergdahl, Blomqvist, 2011)

All of the mentioned phases are also recognizable in the statistical production process in the statistical institutes of B&H. Most of the optimization aspects (planned targets) set in priority 5 of the Strategy are already fulfilled to some extent, but the broader process of optimization that involves the implementation of some kind of generic model for the optimization of the statistical process, such as GSBPM, adapted to the national specificities, would accelerate the process of reaching all the other strategic priorities set in the Strategy as well. This fulfillment can then be precisely analyzed, measured and evaluated through the assessment of possible outcomes listed in the table *Activities to Be Used to Implement Strategic Priorities – Measuring Progress*, at the end of the Strategy.

The adaptation of the GSBPM to the national context involves the development of the statistical business process concept by applying necessary changes, providing at the same time a clearer view of the needs for different aspects of the metadata and quality requirements (inputs, outputs, throughputs, quality indicators) and documentation in different phases of the statistical production.

In order to assess the current situation in terms of establishing national correspondence to the GSBPM, the first activity would be gathering a list of all steps/activities/processes to be carried out in the statistical offices of B&H during a whole statistical production process, integrating all steps taken by each of the subject-related processes. It is essential to ensure a starting point for comparability, analysis and planning as well as coordination of change across relevant statistical activities when capturing each phase of the existing process activities. In the SSO, a catalogue of activities was created a long time before the decision of adapting the GSBPM to the business process architecture was made. This catalogue of activities was created following broad discussions in which all employees described the activities within the scope of their own responsibilities. This catalogue was introduced in SSO as a part of measuring the time spent on each individua l activity during the production process, in order to identify the main cost drivers of the production process, determine the overall component of costs, and then, using an appropriate methodology, to ascertain the total cost of any statistical task in terms of employees' salaries. Later on, when GSBPM was introduced as a goal, all the phases and activities classified in the catalogue of activities were analyzed and compared to the GSBPM. This kind of business process mapping also helps the definition and design of new shared capabilities (i.e. methods and supporting infrastructure) to be visualized in the context of a specific existing process. (Novkovska, Papazoska, Ristevska-Karajovanovikj, 2012) A similar procedure on measuring the time spent on different activities was about to be implemented in FIS in 2015, using the model of Swedish Statistics. It was supposed to be a simple Excel application with a drop-down list of activities and the possibility to write down the time spent on them by each employee. The list of these activities was supposed to be created by the working group composed of the heads of the statistical departments. (FIS, 2015) This procedure of creating a list of the in-scope activities of the statistical phases should be implemented in all statistical institutes of B&H. For each statistical business process, existing information on all activities should be collected – including detailed descriptions and documentation about the current business process activities and the transition plans for individual statistical activities.

In the establishment of the list/catalogue of activities in the statistical offices of

B&H, the following problems might occur:

- No activities are defined (i.e. in the Annual Statistical Program) that address the Specify Needs phase;

- Phases *Design* and *Build*, with all sub-processes and activities in the Annual Statistical Program are covered with very few activities;

- For other phases, one can find more equivalents in the Annual Statistical Program, but not enough, although for some activities different wording is used; and/or

- Some phases/sub-processes are classified in detail, but some activities are found to be very resource-consuming are not even mentioned in the catalogue of activities (i.e. in the Catalogue of Activities by Statistical Tasks of the SSO the process of trans- codification and data transmission to Eurostat, data revisions, statistical disclosure control, quality reporting were not mentioned).

After the mapping of the activities, they should be compared to the GSBPM descriptions of activities included in the described phases and sub-processes. Some anticipated findings are that:

- some sub-processes in the process of the statistical institutes of B&H will be the same as in GSBPM;

- some sub-processes in the process of the statistical institutes of B&H might be left out;

- some sub-processes might be left out of the process of the statistical institutes of B&H, but they are in fact performed in them;

- some sub-processes might be left out in GSBPM as well (for example, in the comparison of the activities in the Statistics Slovenia, the following sub-processes were left out of GSBPM: 1.6 Methodology analysis; 1.7 Incorporation in annual program of statistical surveys - legal grounds; 2.7 Agreements with other institutions regarding provision of data or joint data collection; 9.4 Analysis of process data); and/or
- some sub-processes in the process of the statistical institutes of B&H might be positioned differently than they are carried out in the GSBPM.

Functional processes (i.e. the operation of the NSI, financial management or HR issues) are not part of the GSBPM, so they will not be part of the developed national GSBPM, although they are part of the business architecture and should be tackled in the scope of global architecture development.

3.4. Development of the Te mplate for the Detailed Methodological Descriptions and Applications for All Subject Matter Domains

How information will flow and be transformed through the different stages of the national model depends on the definition and structure of the data as well as on the standardized terminology.

In order to enable the participants of the statistical production process (subject matter statisticians, methodologists, IT staff, etc.) to describe and implement the activities inside statistical processing and to produce the relevant documentation in a unified manner, they should be provided with templates with pre-set rules and details on the expected process. In order to conduct the mapping of all activities that are part of the national interpretation of the GSBPM and prepare a document with descriptions of all processes, sub-processes and activities covering that model, a template would enable each participant of the statistical production process to describe the ongoing activities relevant for each particular survey (statistical product) in a common manner. If this step is not taken, the responsible persons might produce documents which differ in their identified content and details, making them incompatible and/or incomparable with each other. Some sub-processes are closely related to each other, but in the model they are filed under different processes (i.e. Identify concepts and variables; Design output; Prepare draft outputs; Finalize outputs). Their descriptions must be clearly defined in order to avoid overlapping or missing information.

The content of the filled in templates would be analyzed by the WG before its use and implementation in the national GSBPM. This template would be used by all subject-related departments for each of the surveys also after the mapping of all activities that are a part of the national GSBPM and the preparation of the descriptions document. This would serve as a very important tool for the introduction of new activities or the review of the established and accepted national GSBPM, as well as for the metadata and quality systems. The metadata system provides the instructions on the harmonization of concepts, definitions, variables, methods, tools, activities, etc. This template would be used as a part of the metadata system by providing instructions on harmonizing the documentation of processes, sub-processes and activities. On the other hand, the template

would also provide a solid basis for comparability of the quality indicators relevant for specific activities, sub-processes and processes, and become as such a part of the statistical quality system.

3.5. Adoption of the Tailor-Made National GSBPM

A GSBPM is a representation of reality that will vary from NSI to NSI and possibly from survey to survey (in the sense that some surveys will cover more and some less of the sub-processes – i.e. some surveys use administrative data so they do not cover the sub-process *Run collection*; or some surveys are sample-based while others are not, so not all surveys will cover the sub-process *Calculate weights*). Finding representation that captures the entirety/majority of the activities as well as using terminology that is familiar is a prerequisite towards acceptance and adaptation. (Bergdahl, Blomqvist, 2011) The most important aspect is to establish a model that the NSI can rely on to be stable and that will be the common frame of reference, rather than searching for the "perfect fit" and fall into entropy. It is therefore important to understand the interactions inside the GSBPM, the main processes and sub-processes as well as the corresponding activities. Understanding them and understanding the activities conducted in the ongoing statistical processes of the statistical institutes of B&H will enable recognition of the potential national GSBPM.

Figure 9. Understanding GSBPM Interactions

Source: *http://www1.unece.org/stat/platform/display/GSBPM/Communicating+GSBPM*

After mapping the activities of the statistical business process of the statistical institutes of B&H and comparing them to the descriptions of the activities in the sub-processes of the GSBPM, the national GSBPM process and sub-process

phases can be defined and described taking into account the production processes in the statistical institutes of B&H. The definitions of the processes and sub-processes of the national GSBPM should be sent for discussion to all employees in order to let them provide comments and recommendations on the model that will be later used and interpreted by them.

The main reason for the differences between the national and generic models might be that the statistical institutes of B&H have pre-existing production systems, which on one hand might be different among each other and on the other hand cover the processes of the GSBPM *Process and Analyze*. So, replacing them would be a time consuming and resource demanding effort.

A national GSBPM should be defined covering activities in all statistical institutes of B&H, including in it processes and sub-processes relevant for all statistical institutes, even if some activities are not performed at the national level but are performed only at the statistical offices of the entities, and vice versa.

The standardization and automation could play an important role in the definition of the GSBPM, since both standardization and automation are crucial for the further development of the statistical institution, and consequently for cost reduction.

The most important feature of the approach of Statistics Italy (ISTAT) to describing the statistical business processes is the definition of a multilayer framework, identifying three main parts strictly bound to one another: 1) phases and operations - activities manipulating data or oriented to their production, 2) quality control actions - aimed at preventing, monitoring and evaluating errors that affect accuracy, and 3) generalized software - used to perform both of them (phases and operations as well as quality control actions). The activities are defined according to main phases, and then operations and sub-operations are specified under each phase; quality control actions are organized into preventing, monitoring and evaluating activities and are grouped with respect to the main sources of error (i.e. non- response, interviewer effect, etc.); generalized software applies to operations and quality actions performed by electronic means. This model requires and enables a more detailed description of how the activities are performed, which further supports the automatic identification of the common practices, methods and software. (Brancato, Simeoni, 2012)

The methods used in Statistics Germany (DESTATIS) for the further optimization of the sub-processes identified in the national GSBPM (GMAS) are comparative

analyses (benchmarking), the identification and transfer of good and best practices, and finally the definition of standards. At the beginning of the process analysis, the most important sources about statistics available are the database of statistics and quality reports, and t hen a tailor made questionnaire is used, requesting facts concerning the process workflow and process assessment, namely timeliness of conception, use of administrative data, plausibility checks, used IT tools and interfaces, as well as good practices, problems within the workflow, satisfaction of user requirements and a self-evaluation of quality. All collected data is comprehensively analyzed, basically through comparative analyses between statistics, phases and sub-processes of statistics, calculating indicators and generating graphics. Information about the personnel capacities deployed, according to tasks, statistics and sub-processes of statistics, is also collected. (Lüüs, 2012)

As can be seen in the examples above, detailed descriptions and a hierarchical structure, as well as the iterative analysis, comparison and evaluation of the collected information according to different criteria - about the statistical methods (including the management of data and metadata) and about IT tools, are required for the identification of relevant and common activities of the whole statistical business process, regardless of the subject matter. These are also necessary for the further standardization of activities through the preparation of a list of recommendations regarding the best or better practices and useful resources, relevant to the specific statistical activity. During this analysis, not only good practices will be identified, and it is not always possible to provide an immediate better solution, but it is always possible to refer to those statistics for which better solutions are currently available. (Lüüs, 2012) Additional challenges might be encountered when updating and documenting the process on the survey level or adjusting the business process model when software platforms change.

The structure of the national GSBPM - breakdown of processes - presents a sound basis for further optimization through standardization and automation and generally further development. Therefore, this structure should be accompanied by separate documents with detailed descriptions and explanations for every activity and item at the smallest level.

3.6. Development of IT Tools

The operational model of IT usually has the most common approach, unifying the process phases of the statistical business process. An information system should

be established to serve as the main source of information about the common processes. In order to harmonize statistical computing infrastructures and facilitate the sharing of software components, a unified IT tool, supporting workflow, process management and follow- up should be developed. It should be constructed according to the national model and built up in a tree structure, so that the level of information detail is increased through a system o f links. It should include all of the common methods, tools and approaches that have been agreed upon, including any information related to them, and should be available for all employees through the intranet. This would result in more transparent statistical data production, which facilitates efficiency, process quality improvement and a clearer allocation of responsibilities.

The elaboration of this unified IT tool should incorporate the development of sub-tools, such as: an IT tool that unifies/standardizes the processing phases of the statistical process (this IT tool would enable the standardization of specific processing phases), an IT tool for the automation of maintenance (this IT tool would be related to metadata and quality management as well as dissemination) and an IT tool for the monitoring (this IT tool would enable the monitoring of the performance of all activities of the whole statistical production system). The standardization of processing phases includes for example IT solutions for questionnaire design (i.e. checking used variables and questions), uniform editing (i.e. selective editing), imputation (i.e. depending on parameters hot-deck or multiple or regression imputation), evaluation (i.e. using parameters to define the sampling design), dissemination (i.e. disclosure controls), etc. The automation of maintenance includes IT solutions for merging data from different sources or for ordered conditional performance of the activities of some sub-processes (i.e. editing by data collection, outlier detection, editing by data processing, and imputation) or merging inputs/outputs in the systems (i.e. using outputs of some activities in the quality system or using documentation of activities as input for the metadata system). The IT tool should enable tailor-made calculations of some indicators and graphical interpretations of some analyses, which would serve as monitoring parameters for the overall performance.

The total repository of methods, tools and approaches should have a user-friendly design. Information on changes to the content should be available to all employees through a logbook. A platform for providing feedback or asking questions should also be established.

It goes without saying that this IT tool should be strongly connected to and

support the metadata and quality systems (including their IT solutions), which are the overarching processes of the GSBPM implementation.

3.7. Preparation of the Detailed GSBPM-based Process Documentations

The original aim of the GSBPM was to provide a basis for statistical organizations to agree on standard terminology to aid their discussions on developing statistical metadata systems (Vale, 2011). No specific standard or model is used at the statistical institutes of B&H to guide the collection of documents (generally metadata) across all statistical processes and activities. Apart from the core processes, management and support processes also need documenting, even if in a very general form. The processes that need more detailed documenting are the management of statistics (statistical activities), methodology development and quality and metadata management.

The GSBPM-based process documentation includes the strategy of the project, project definition and description (like terms of reference), list of milestones and deliverables, different structures, standards, guidelines, IT tools, templates for a unified description of activities and other methodology-relevant specifics (especially relevant for the description of some specific activities, such as specifying needs, sampling, coding, editing, imputation, weighting, evaluation, etc.), mapping table of all relevant activities identified from both sides

– the GSBPM and national business model side, description of all activities and sub-processes, descriptions of different structures, standards, templates, guidelines and tools.

The GSBPM-based process documentation should also include the metadata output documents: methodology documents and specifications, description of key statistical outputs and key statistical concepts and variables, definition of classifications and code lists, description of production systems and flows, different types of user documentation, documentation on provider comments, complaints and queries, questionnaires, documentation of microdata files, assessment of the quality of the final data/outputs, brief report on the result of the disclosure control, ESMS reference metadata, metadata relevant for archiving, etc.

A methodology handbook could be developed in a project as an essential step of the quality-related internal development program. The handbook would follow the structure of the national business model of statistical institutes of B&H and would

be directly connected to the quality guidelines. It would serve as an internal methodological document providing clear professional information on the approach to each process phase, defining the necessary methodological background information and standardizing planning practices for the relevant methodological areas, but would also serve as an external methodological document to improve the transparency of strategies by providing necessary information to the public about the methodologies used. The internal version should be more in-depth, while the public version should be less detailed and should contain a more user-oriented description of the processes and approaches. Such a methodological handbook was developed as a part of the implementation project of the national business model (ESTFM) of Statistics Hungary. (Szekeres, Nagy, Ábry, Mag, Vereczkei, 2014)

In regard to qualitative aspects that have to be considered during each phase, adequate quality dimensions and indicators should be identified, calculated and analyzed, using the existing UNECE indicators suggested for the GSBPM. These quality indicators were determined by examining practices within national statistical agencies, United Nations'

Statistical Commission National Quality Assurance Framework, European Statistics Code of Practice, Euro SDMX Metadata Structure, national and Eurostat quality assurance frameworks, European Statistical System Standard for Quality Reports Structure and Single Integrated Metadata Structure. (UNECE, 2016) These indicators and their analysis should be documented and stored as a part of the overall process documentation as well.

3.8. Establishme nt of the GSBPM-based Metadata System

Some basic architectural principles of particular significance to statistical metadata are:

- Metadata-driven processes: metadata should be an integral part of the process and precede the data, meaning that statistical metadata from specifying needs and survey specification, sample design and edits to products and services must be captured, managed and used to drive the entire statistical process.
- Maximized re- use: the organization is driven towards common business processes and

enabling computer systems, meaning existing corporate systems, statistical data

and information structures supporting the metadata (i.e. concepts and classifications) should be re- used.

 Governance: data and metadata management spans the statistical business process, identifying metadata management as a key element in the statistical business process.
(Greenough, Mechanda, Rizzolo, 2014)

Metadata for each step of the survey process as well as the collection instruments, complementary documentation, statistical variables and classifications should be collected and stored. (Greenough, Mechanda, Rizzolo, 2014) Developing a statistical metadata system implies an understanding about how metadata are created, transmitted, updated and re- used within the production process. All metadata should be structured the same way for all surveys and statistical programs. A key impetus for the development of the GSBPM was that when NSIs wanted to discuss metadata in the context of their statistical business processes, many agencies had similar but different descriptions of their statistical business process, and it was not easy to relate the different descriptions to each other. Therefore, the GSBPM provides a common "reference model". SDMX (Statistical Data and Metadata eXchange) and DDI (Data Documentation Initiative) are two standards, which are compatible with GSBPM, for managing statistical metadata and data. (UNECE)

The identification and definition of metadata for each phase of the national GSBPM, including the quality aspects, should be done immediately after the official promulgation of the model in the statistical institutes of B&H in order to facilitate this process by using the activities done and documents produced during the determination of the national GSBPM.

3.9. Establishme nt of the GSBPM-based Quality Management System

Definitions of quality set up standards, processes, procedures, methods and tools for quality requirements, quality measurement, regular assessments and evaluations capable of sustaining and developing the quality of statistical data.

Since the CoP principles and indicators provide a basis for measuring quality in the sense of "being fit for purpose", NSIs' commitment to continuous improvement can be monitored through the fulfillment of the indicators associated with certain principles of the CoP. Therefore, a mapping between the national business model and CoP should be performed. This mapping should be

approached from both sides: identifying the principles and indicators that are relevant for each activity and sub-process, and identifying the activities and sub-processes relevant for each individual principle and the corresponding indicators.

Process quality guidelines with quality measurement tools, such as the DESAP-based self-assessment questionnaire and a process quality indicator catalogue, should be developed. These tools are then used to assess the compliance with the quality guidelines. The DESAP-questionnaire should be adapted to the national circumstances, and the quality indicator catalogue should contain quality indicators for the same processes applied in the guidelines. These guidelines would provide feedback on the extent to which the statistical data and data production processes meet expectations, so that the statistical institutes of B&H can evaluate the quality of the services provided to users of statistical data and, if necessary, can intervene in the relevant processes to develop them further. These quality guidelines should be structured along the logic of the national business model, laying down quality guidelines for all process phases and sub-processes of the national business model. When compiling the guidelines, a number of already developed international guidelines and requirements should be consulted. In Statistics Hungary, the following additional information constitutes part of the quality guidelines:

- Chapters range from general to more detailed and structured to be more concrete, concise and summary-like;

- There are chapters with a focus on social statistics and business statistics ; and

- There are chapters on data transmission and data collection. (Szekeres, Nagy, Ábry, Mag, Vereczkei, 2014)

These aspects could be easily and profitably adopted in the creation of the quality guidelines for the statistical institutes of B&H.

Such a document that identifies all the information needs and flows throughout the phases of the national business model and emphasizes inputs and outputs from the national business model phases regarding to the metadata and quality, would be an asset for the survey managers of the statistical institutes. (Novkovska, Papazoska, Ristevska-Karajovanovikj, 2012)

4. Conclusion

NSIs are under continuous pressure from the government and society, which demand more and more data to be produced at a lower cost and with less respondent burden. In this context, the current stovepipe production method is unsustainable. (Greenough, Mechanda, Rizzolo, 2014) The adaptation of an international standard for business processes makes it more efficient to compare and integrate international best practices and standards in the methodology, quality and IT fields, enabling a reduction of the burden and costs as well as improvements in the methods and methodologies used. Due to the use of a coherent system, the integration and standardization of statistical sub-processes and activities, including overarching and overhead processes for achieving better efficiency by better management of resources, the needs for harmonisation and further methodological developments can be identified. (Szekeres, Nagy, Ábry, Mag, Vereczkei, 2014) An output from every phase/sub-process/activity is an input in another phase/sub-process/activity, and thus monitoring quality from the very first activity of the business model used onwards is of extreme importance for the quality of the final product.

The GSBPM would help all statistical institutes of B&H to have:

- good documentation - all steps in the production process as well as the related IT systems defined, described and documented in a harmonized manner;

- consistent approaches in the separated production processes – generic rather than once-off approaches to methodological, organizational and IT solutions for statistical processing;

- better governance - process-based organizational structures and strategies, emphasis on the planning and evaluation phases of the statistical production process;

- better quality management - coherent and effective data management and monitoring of resources and outputs per process/sub-process/activity; and

- more efficient production of statistics – culture of learning and improving, faster and cheaper response to new demands using repeatability of good practices and solutions, existing tools and documentation. (UNECE)

Many statistical offices have already initiated a process of modernization and

transformation, and therefore their already-established implementation processes, experiences and materials used and produced during their transformation/modernization projects are available for study. The statistical institutes of B&H can quickly adapt the GSBPM to their own situation and conditions by relying on these available examples. This might include international support in the form of a funded project, but the statistical institutes of B&H should first independently prepare an initial draft of their desired goals.

This paper, with its summaries, theoretical and graphical examples and references, might (can) be used as an input for the definition of a project for the establishment of the GSBPM within the statistical institutes of B&H, or as a guideline in the implementation phase of the mentioned project. The statistical institutes of B&H have great potential as well as the technical and human resources necessary for the modernization of the statistical production and improvement of the quality of the produced statistics.

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SELECTIVE EDITING – NEW APPROACHES AT THE STATISTICAL OFFICE OF THE REPUBLIC OF SLOVENIA

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Rezime

Data editing has always been considered as one of the most demanding and consequently most costly parts of the statistical process. Therefore, statistical offices are putting a lot of effort into activities that would reduce costs and decrease the workload caused by this part of the process. Implementation of a selective editing approach is certainly one of the most commonly used means to achieve this goal.

The entire editing process should be designed in such a way that it focuses on the mistakes that actually affect the estimates. Selective editing approach aims to search for significant errors, accepting that the final data set still contains a number of errors with no effect on the final estimates. Its main purpose is therefore to reduce the amount of changes in the microdata, maintaining the acceptable quality of statistical results. This not only leads to a reduction of costs, but also to improved overall quality of the data.

The Statistical Office of the Republic of Slovenia has already been using the selective editing approach for some time. The problem of the current practice is that it is based on the so-called system of key respondents. Key respondents are the most influential units that are pre-selected to be treated differently in the data collection and data editing phases. Recently we have been trying to introduce a different approach, which would be based on the posterior information obtained in the data collection phase and on the appropriate implementation of the score function idea. With this approach, the number of errors that require manual attention is reduced.

The paper presents the results of the feasibility study carried out to investigate the possibilities of introducing the new approach and to explore possible benefits of the renewed system. Results of the feasibility study are followed by strategic outlines for further development.

Keywords: *selective editing, error detection, score function, statistical software*

JEL classification: *C18, C81, C88*

1. Introduction

One of the most outstanding problems concerning data editing in official statistics is the problem of over-editing. This is especially true in the case of business surveys, where the self-completion approach to data collection is usually used and much of the editing work is still carried out by the survey statisticians in the office. The origin of this problem is usually the (well-intended) goal of survey statisticians to remove all or at least most of the errors from the input microdata. The consequence of such intention is that there are too many, too strict edit rules leading to a large amount of suspicious data that should be verified. The further consequences of such practice are high costs of data editing and very probably also inefficient process of data editing. Namely, if we have a large amount of data to be verified and (as usual) limited available resources, we will do the verification superficially and will not eliminate the really important (influential) errors from the data.

At the Statistical office of the Republic of Slovenia (hereinafter SURS) we are quite aware of this problem and are trying to at least diminish its negative consequences. There are several means to achieve this goal, including additional training of survey statisticians (aiming at reaching a different understanding of the role of data editing) as well as introduction of new procedures into the data editing process. Our paper concentrates on the latter set of activities, aiming to describe the efforts to introduce the so-called selective editing procedures into our statistical production system.

The first part of the paper brings a brief overview of some basic information on the selective editing approach and its basic tools. This is followed by a brief description of the current situation in this field at SURS. The main part of the paper is devoted to the description of the simulation study, where we tested the feasibility of introducing selective editing procedures, using the output approach, in one of our business surveys. The paper concludes with the main outcomes of the simulation study.

2. Selective editing

The so-called selective editing procedures are among the most frequently used means to at least limit the impact of over-editing. The basic idea of this approach is that all the suspicious units, hence the units that failed at least one of the edit rules, are ranked according to their importance and in the next step only the data of the units above a certain threshold are inspected manually

(usually by re-contacting the reporting unit) and certain data items are corrected, if necessary. The data of the units below the threshold are on the other hand not verified again, but are either left unchanged or are corrected with the automated editing procedures. There are two key issues that should be resolved during the implementation of this approach: how to set up the system for ranking the units and how to determine the threshold.

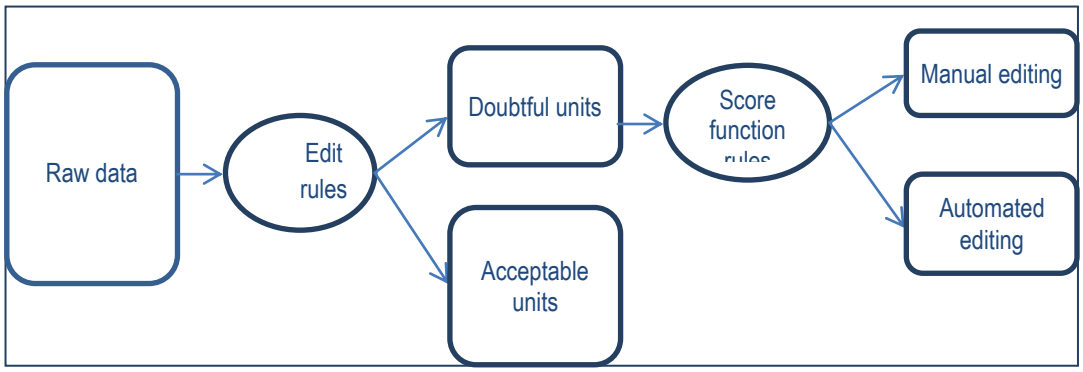
Ranking of the units that didn't pass the system of edit rules is usually based on the mathematical procedure, also called the score function. With the score function we assign to each data item in the suspicious records a certain numeric score, which then serves for the purposes of ranking. There are several possible implementations of this procedure, combining different possible measures, such as:

- Size of the unit (according to a certain auxiliary variable)
- Predicted impact of the detected error on output statistic(s)
- Size of the unit (according to a certain auxiliary variable)
- Number of failed edit rules in which the certain data item is explicitly involved
- Relative importance of the edit rules

By combing these factors, we get the so-called local score function (also called item score), which provides a score of a particular data item in the "failed unit". In the next step we then combine these local scores into a global score function (also called unit score), which gives a score of the whole record. This score is then used as a basis for setting up a threshold for selective data editing.

How to set up a threshold is in fact more a practical than a theoretical consideration. The most appropriate threshold should be set up for each particular survey through empirical simulation studies. Theoretically, the goal would be that the (possibly erroneous) data of the units below the threshold shouldn't have a significant impact on the final output statistical results. The figure below presents graphically the basic idea of the selective editing approach.

Figure 1. Selective editing – basic idea



3. Current practice at SURS

3.1. The system of key respondents

SURS has been using the selective editing approach for some time. The approach that is predominantly used at the moment is based on the so-called system of key respondents. This means that some units that have a large impact on the final result of the survey estimates are pre-selected and are treated differently during the collecting phase, where we make a lot of effort to obtain complete and accurate response from them. These units are called the key respondents.

This approach is used in all business surveys carried out by SURS. We usually get the data by paper or web questionnaires. If the key units do not respond, they get a set of reminders, the main goal of which is to get the data from the units. With the first reminder they are kindly asked to participate in the survey. In the second and potentially even the third reminder the units are informed about their legal obligation[15] to participate in SURS's surveys. With every reminder also a link to the online questionnaire and a phone number are attached, where units can participate in the survey. The number of reminders and the mode of the data collection (or a combination of modes) differ between surveys. The predominant mode in our surveys is still using paper questionnaires, although this is changing every year in favour of the web questionnaires.

[15] In Slovenia business entities are legally obliged to participate in statistical surveys carried out by SURS.

3.2. Simplified approach of selective editing

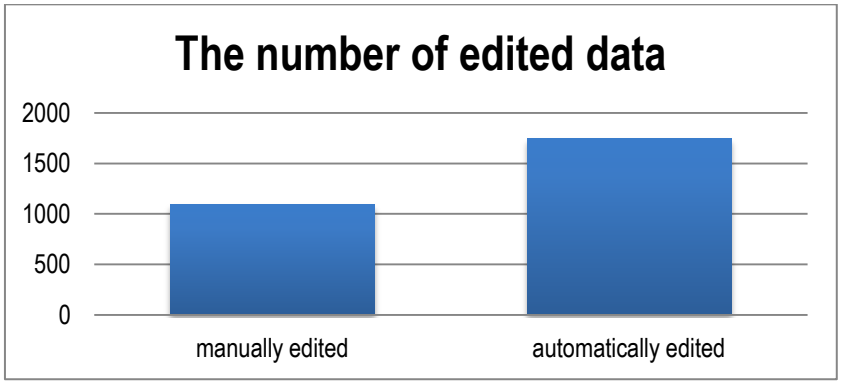
In the annual statistical survey on investment in fixed assets a simplified approach of selective editing is currently used. The purpose of the survey is to determine the investment activity of the economy in Slovenia. Units of observation are all legal persons registered for performing activity on the territory of the Republic of Slovenia.

The data are collected by a paper questionnaire. The units that do not respond are reminded by e-mail to answer the questionnaire. In this survey the "do not forget" reminder is sent out four days before the due date, the first reminder is sent 13 days after the due date and the second reminder 27 days after the due date. Shortly after the last reminder it is checked if the key units have answered the questionnaire. If not, telephone follow-up of the key units is carried out by the Contact Centre analysts. Key units are reminded to answer the questionnaire and send it to SURS. With the described procedure the full response from the key units in the collecting phase is obtained.

The next phase of the statistical data processing is the editing phase. As mentioned, the simplified approach of selective editing is used. After the initial data validation, the variables are divided into two (disjoint) sets. One set of variables is then edited automatically and the other part is edited manually. Here manually means that we re-contact the units and interview them again to clear out the errors that occur in the data.

The figure below shows that from the total of 5,500 respondents in the reference year 2015, due to the automatic correction of one set of units only 1,092 units were corrected manually, while 1,741 units were corrected entirely automatically.

Figure 2. The number of edited data



Source: Author's illustration

Since a part of the variables is edited automatically, the number of units that have to be re-contacted is reduced. This way, the statistical data processing of the data of the annual statistical survey on investment in fixed assets is less costly and less time consuming.

4. Simulation study

This section presents the idea of selective editing which uses the output distribution based on the score function. We do not use such selective editing in the production yet, so we simulated the process of selective editing in the case of the annual survey on trade data. This section describes all the procedures in the process we carried out for the purpose of introducing selective editing.

4.1. Selective editing with the score function approach

At the beginning of the process of selective editing we need to define edit rules and implement logical checks on the input data set (raw data). Logical checks split the input data set into two parts. The first part contains data satisfying all edit rules (acceptable data) and the second part data containing the units that did not entirely satisfy the edit rules (suspicious data). Further on we focus on suspicious data as we want to divide them into data that will be edited manually and data that will be edited automatically. To make that division we must first define the score function. For proper calculation of the score function it is important to specify the expected values of the key variables of the suspicious data. To specify the expected values we first delete the reported values and then impute them with general imputation methods. These expected values are then used to calculate the local score function. As described in the section about selective editing, a significant deviation from the expected value indicates a higher risk of incorrect data. So we calculated the local score function as the absolute difference between the expected and reported value. Since our target statistical estimate is the population total, we multiplied the difference by the weight of the unit. The local score function is thus determined as:

$$f_l(y_{ij}) = w_i \cdot |\hat{y}_{ij} - y_{ij}|.$$

Thus we obtain four new variables for each unit – the value of the local score function for every key variable. To determine the global score function, we further calculate standardized local values for each unit. From the values of the local score function we calculate the standard deviation for each f_l. By using the

standard deviations, we define the global score function as the sum of the standardized local values:

$$g_i = \frac{f_l(key\_var1_i)}{std\left(f_l(key\_var1)\right)} + \frac{f_l(key\_var2_i)}{std\left(f_l(key\_var2)\right)} + \frac{f_l(key\_var3_i)}{std\left(f_l(key\_var3)\right)} + \frac{f_l(key\_var4_i)}{std\left(f_l(key\_var4)\right)}.$$

In such a way we obtain the value of the global score function for each unit. The values are in the next step sorted in descending order from the highest to the lowest, and then we calculate the cumulative value of the global score function defined by the recursive formula:

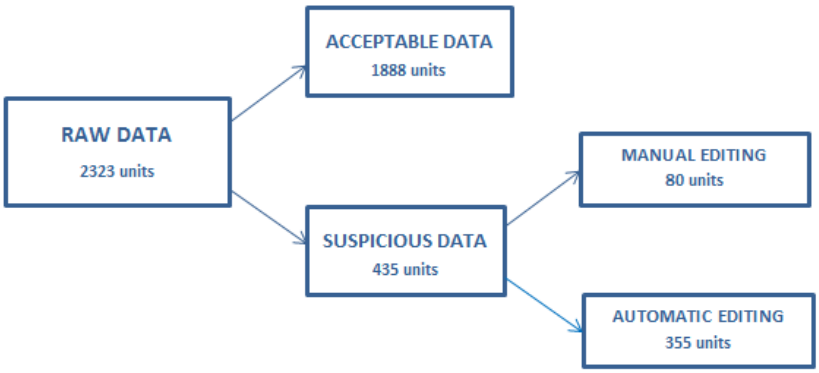
$$\mathrm{c_i} = \mathrm{c_{i-1}} + \mathrm{g_i}, \text{ where } \mathrm{c_0} = 0.$$

In the next step we calculate for each unit the cumulative proportions to the total sum of the global score function:

$$p_i = \frac{c_i}{\sum g_i}.$$

On the basis of this proportion the units are divided into those that will be edited manually and those that will be edited automatically. For the purposes of this study, we set the limit at 80% of the value of the global score function. So the units that take up over 80% of the global score functions are edited manually and the others are edited automatically. Figure 3 shows the entire process, together with the distribution of units.

Figure 3. Diagram of data distribution



4.2. Automated data editing

For the purposes of the simulated selective editing process, we simulated two different approaches. We used general Banff procedures in the first and ad-hoc programmed corrections in the second approach for automated editing. Banff is a system developed at Statistics Canada that offers methods for editing and imputing survey data in the form of 9 SAS procedures. To perform editing with the Banff system we first need to supplement the set of edit rules to the full set of edits. The *proc verifyedits* procedure generates additional edits which are implied by a group of edits. When we have a full set of edits, one of the key parts of the selective editing process follows and that is the error localization. The term error localization indicates the part of automated data editing in which for each suspicious unit we determine which variables will be corrected in the next step. Banff provides error localization with one of its procedures (*proc errorloc*), which is conducted on the basis of the Fellegi–Holt approach. This well-known approach suggests finding the minimal number of edit operations needed to make an observed record consistent with the edit rules. So we want to determine the minimum list of variables that need to be corrected and that after the corrections, these data will pass all the edits. Error localization is followed by the final phase of automated data editing. In this phase we correct the variables that were chosen in the error localization phase. To carry out the corrections, we use two Banff imputation procedures. Unfortunately, in the implementation process with Banff procedures, we encountered a problem, because the full set of edits couldn't be changed into a suitable form for Banff. Therefore, we added some derived variables, and by using them we could transform edits into the "Banff acceptable form". Unfortunately, this is not the most practical solution, since the further procedure edited the derived variables data and not the original data. This has emerged as a weak solution because at the end of the process we get output data that don't satisfy all the edits. Since the prerequisite for including selective editing in the process is acceptable data, we assess that results obtained with Banff are not sufficient for inclusion in the process. So we simulated the second approach with custom ad-hoc programmed corrections.

As in the first approach, once again the data initially go through the system of edit rules. Thus the data are again divided into those that satisfy all edit rules and those that do not. By using the score function we determine which units will be edited manually and which automatically. The units that we have chosen for automated editing are edited by successive custom programmed corrections that are directly derived from logical checks. Through such a process in several steps the data are edited to acceptable values for edit rules.

The table below presents the ratio of aggregates compared to previously published results where 80 units were edited manually and 355 automatically.

Table 1. Ratio of aggregates compared to previously published results

NACE	FREQ	PRIH_SLO_TDR	PRIH_SLO_TD	PRIH_SLO_POSR
Total	2323	1.006321	0.974701	1.021762
00.0 – other	146	1.008993	1.004803	1.236049
45.1+45.3+45.4	194	1.021372	0.993873	1.109299
45.2	25	1	1	1
46.1	483	1.002924	0.946495	1.017858
46.2+46.3+46.4+46.5+46.6+46.7+46.9	738	0.992029	0.986257	1.000088
47.1	103	1.001414	0.740242	1
47.2	47	1	1	1
47.3	37	1.014623	0.967406	1
47.4	26	0.999914	1	1.00003
47.5	101	1.023504	0.983781	1
47.6	59	0.980923	1.011443	1
47.7	249	1.001335	1.014361	1
47.8	13	1	1	1
47.9	102	1.00058	0.963677	1

In the table we can see that the results at the level of the total population are comparable with the published results, but bigger deviations occur at the level of NACE groups. To improve the results at the level of NACE groups, we calculated the score function at a lower level. Despite the fact that more units were edited manually (100 units), the results are not significantly improved. Since the calculation of the expected values is the main factor for setting up the score function, we endeavoured for a more precise calculation of the expected values. First, we set the expected value for some units before imputing data with traditional imputation methods. To further improve results, we took the values from the annual reports (administrative data) for the expected value. The score function calculated from such expected values determines 110 units for manual editing and 325 for automated editing.

Table 2. Ratio of aggregates compared to previously published results

NACE	FREQ	PRIH_SLO_TDR	PRIH_SLO_TD	PRIH_SLO_POSR
Total	2323	1.003424	0.989049	1.010148
00.0 – other	146	0.988823	1.006015	1.236049
45.1+45.3+45.4	194	1.00221	1.014447	1.109299

45.2	25	1	1	1
46.1	483	1.001343	0.938152	0.999855
46.2+46.3+46.4+46.5+46.6 +46.7+46.9	738	0.985543	1.009991	1.000088
47.1	103	1.001414	0.740242	1
47.2	47	1	0.949212	1
47.3	37	1.014623	0.967406	1
47.4	26	0.999914	1	1.00003
47.5	101	1.023504	0.983781	1
47.6	59	0.980923	1.011443	1
47.7	249	1.002689	1.014361	1
47.8	13	1	1	1
47.9	102	1.00058	0.963677	1

We can conclude that despite the different implementations of the score function also with custom programmed corrections we did not get the significant improvements of the results. But, despite some large deviations from published results in some NACE groups, it is necessary to point out that the data corrected with custom programmed corrections are of acceptable quality. We can also conclude that the results at the level of the total population are very good for each variable, since the published data differ by about 1%. On the other hand, some significant deviations still occur at the level of NACE groups and that will be the subject of further analyses and improvements of the whole process.

After the completion of automated editing with custom programmed corrections we also conducted automated editing with Banff procedures according to the latest score function distribution. Results are shown in the table below and are intended to show a more precise analysis of the results.

Table 3. Ratio of aggregates compared to previously published results

NACE	FREQ	PRIH_SLO_TDR	PRIH_SLO_TD	PRIH_SLO_POSR
Total	2323	1.003166	0.998777	1.020238
00.0 – other	146	0.988171	1.006907	1.236049
45.1+45.3+45.4	194	1.000079	0.999857	1.109299
45.2	25	0.999971	1	1
46.1	483	1.000261	0.992662	1.015481
46.2+46.3+46.4+46.5+ 46.6+46.7+46.9	738	1.005554	1.002653	1.000088
47.1	103	1.000125	1	1
47.2	47	1	1	1
47.3	37	1.012024	0.967406	1
47.4	26	1	1	1.00003
47.5	101	1.017977	0.980108	1

47.6	59	1.001768	0.99422	1
47.7	249	1.000041	1	1
47.8	13	1		
47.9	102	0.997395	0.924291	1

4.3. Results and analysis

As stated above, the aggregates at the level of the total population are acceptable for each variable, while some significant deviations still occur at the level of NACE groups. If we compare the aggregate calculated according to the latest score function distribution, we see that both approaches of selective editing give similar results. But since we must be aware that every survey statistician primarily wants to calculate aggregates from acceptable data, we can conclude that selective editing with Banff procedures will not be suitable for this survey. The main problem when editing with Banff procedures is the complexity of the edit rules and the fact that only linear edits are suitable for Banff. This represents a considerable constraint for many surveys.

A more appropriate approach to introducing selective editing in the statistical process is the approach with custom programmed corrections. Data generated with automated editing with this approach are “cleaned” at the end of the statistical process. Here we have to point out that “cleaned” here doesn’t mean clean in terms of the elimination of all errors from the data set, but cleaned in terms of acceptable values for a set of predefined edit rules. We must also point out that a more detailed analysis of the results revealed that large differences in aggregates arise mainly due to one unit in each of the NACE groups; however, due to the small number of units in each group, this is strongly reflected in the final results.

5. Conclusions

We have to realize that the process of data editing is one of the most demanding parts of the statistical process. In most surveys data editing requires a large investment, both in time and cost. At the same time we must also bear in mind that data editing is a key part of the process when providing quality results. For this reason more and more attention is given to the search of new processes of data editing that would rationalize the existing procedures while ensuring results of appropriate quality. We believe that selective data editing is a step forward toward this goal, but we are also aware that some improvements in implementation procedures will still be needed.

Simulation of the process of selective editing with custom programmed corrections showed that the inclusion of selective editing in the statistical process is feasible. The results showed that selective editing can be included in the process and it is possible to obtain comparable results, but some further improvements would be required. Possible improvements are evident especially in additional testing of the score function and various ways of combining local and global score functions, additional testing of the score function at different levels, improvements in the process of determining the expected values, especially in terms of more extensive usage of administrative sources and usage of administrative sources already in the phase of data validation.

At the end of the paper we want to point out once again that the goal of selective editing is not to obtain correct data for all units, but to obtain acceptable data which may still contain errors, but they have a negligible impact on the final results. In the last section we underlined the weaknesses of this approach and indicated possible improvements; however, we have to realize the large benefits of introducing selective editing. In the simulation process of selective editing we reduced the number of units that need to be manually edited to only a quarter of the currently manually corrected units. This is certainly a significant rationalization of the editing process.

Table 4. Number of manual and automated edits

	Current process	Simulation of selective editing
Manual edits	435	110
Automated edits	0	325
The proportion of manual edits	100%	25.3%

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UTILIZATION OF BALANCED SCORECARD AS A MANAGEMENT TOOL IN STATISTICAL INSTITUTES

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In the era of globalization, the social, economic and demographic fast changes made official statistics under increased pressure to provide more reliable, high quality, relevant and internationally comparable statistics for all users. Adoption of modern management tools can help them to face these challenges. An excellent management tool is Balanced Scorecard model as a probative tool for achieving better performance and efficiency in private and public sector. The purpose of the paper is to look at the Balanced Scorecard and discuss in which way it could be applied in official statistics. Methodology of the paper is based on extant literature on the BSC system and reports of BSC applications in other statistical institutes. Findings of the paper are that modified BSC can help statistical institutes to face the challenges in this fast changing environment, manage necessary changes to satisfy all stakeholders and face with increased demands for high quality information.

Keywords*: Strategic management, Modern management tools, Official statistics*

JEL classification*: C40, C80, E01*

1. INTRODUCTION

In the last two decades societies worldwide have passed through fast social, economic and demographic changes. The rapid development of information - communication technologies and the globalization of economics have transformed societies from industrial to knowledge based societies which are much more complex for managing all types of organizations. In order to survive and achieve competitive advantage in a present competitive world, private sector organizations adopt new management tools, techniques and philosophies.

Public sector organizations are also forced to adjust to the very fast changing environmental conditions. New modern approaches to strategic management must be adopted in public sector organizations to improve their efficiency and effectiveness.

Official statistics are statistics published by government agencies as a public good. They provide quantitative or qualitative information on all major areas of citizens' lives, such as economic and social development, living conditions, health, education, and the environment. Statistical data collected and disseminated by statistical institutes are unavoidable for functioning of every democratic society in free market economy and crucial tool for economic and social development. The main users of official statistics are government institutions, academics and researchers, private sector, journalists and students. The institutes of statistics must provide reliable, high quality, relevant and internationally comparable statistics for all users. The value and usefulness of statistical data depends on their quality. As the operating environment of statistical institutes change, needs of the users of statistics also change very fast. The management of statistical institutes must permanently improve their activities to offer products and services which will meet the changing needs of all official statistics' users. According to Jeskanen - Sundström (2007) the biggest challenges and risks to the management of statistical systems can be considered into the following questions:

- Society changes at ever-increasing speed. How well can statistical authorities anticipate these changes and continuously develop their activities and statistics accordingly?
- The weight of statistical information in political decisions and in their monitoring is increasing. How can the independence, sovereignty and impartiality – and ultimately the credibility – of statistical authorities be upheld under these conditions?

- There is an overwhelming supply of information, especially due to world wide web. How can statistical organisations secure their visibility on the information markets as producers of reliable factual data?
- IC technology continues to develop rapidly. How efficiently and productively can statistical offices exploit new technologies?
- Official statistics are regulated by a variety of laws. How can the interests of official statistics be safeguarded when the legislation changes?
- Official statistics are dependent on high-quality basic data. How can the data suppliers' motivation to respond be held sufficiently high?
- In many countries a vast proportion of statistics is produced by exploiting administrative registers. What is the future of register-based statistics as administrations develop?
- The public sector and international organisations face tightening financial constraints. How can the efficiency and productivity of statistical offices be raised so that they can continue to develop their activities even within limited budgetary frameworks?
- Competition for skilled and professional employees is toughening on the employment markets. How do statistical offices fare in this competition?

The institutes of statistics in these conditions must be managed strategically, with clear strategic plans and best using of their resources to meet the needs of its users. Adoption of modern management tools in statistical organizations can help them to meet these challenges. An excellent management tool is Balanced Scorecard (BSC) model which has appeared as a popular strategic performance measurement and control system within various public sector organizations as it assists in effectively implementing strategy and in measuring performance.

Institute for Statistics of the Federation of Bosnia and Herzegovina in three - year work plan for the period 2017 - 2019 set a goal to implement Total quality management (TQM) to follow and improve quality of statistical processes and products. Hoque (2003) concluded that TQM does not consider employees in its search for continuous improvement but the BSC does. Therefore, by adopting a BSC an organization that has adopted TQM may overcome this oversight which should increase employee satisfaction and subsequently organizational performance. The key idea of both is to synchronize strategy, vision, operations and employees. Organizational BSC is a natural follow up to the use of TQM principles. Human resources are the key of success in every organization and performances of the organization are determined with performances of individuals (Androniceanu, Sora, Paun and Jiroveanu, 2010). Commitment and participation of workers in the public sector is related to their work satisfaction.

Motivation and commitment of workers are an essential condition for the success of the public institutions and a key element of the human resource management policy.

2. THE BALANCED SCORECARD[16]

The BSC is approach to strategic management developed by Kaplan and Norton in the early 1990s, representing a main development in management accounting in the past decade (Ittner and Larcker, 2001).
In 1990, Kaplan and Norton conducted a research study in twelve enterprises in US to find new methods of performance measurement. They believed that financial measures of performance were not effective in new economy firms. Traditional financial measures were designed in old economy when the key economic resources of the companies were natural resources, labour and capital. Financial measurement system under these circumstances was enough for decision making process. Transition from the industrial to the post – industrial economy forced leaders to measure value differently because intangible assets are playing an increasingly important role in the new service economy. Nowadays leaders are relying much more on measurement of intangible factors and the interaction between them to make decisions. Intangible factors are difficult to define and cannot be expressed in monetary terms.

Kaplan and Norton discussed many possible solutions to make an adequate tool which would measure financial performance as the outcomes from past actions and supplements of these measures with factors that would drive future financial performance but they decided on the idea of scorecard.

In 1992, Kaplan and Norton labelled the new tool the Balanced Scorecard model as a tool able to tide the limitations of the traditional performance measurement tools. The main objective of the BSC is to enable organizations to formulate strategic goals and select a set of quantifiable measures derived from an organizational strategy.

After next four years Balanced Scorecard was adopted in many organizations. It became very popular performance measurement tool which achieved immediate results. Many of the world leading organizations claim that balanced scorecard techniques give them an edge in objectively quantifying, tracking and managing business performance (Figg, 2000). According to Niven (2003) the Balanced

[16] More about the Balanced Scorecard concept see at Niven, P.: Balanced Scorecard Step-by-Step for Government and Nonprofit Agencies

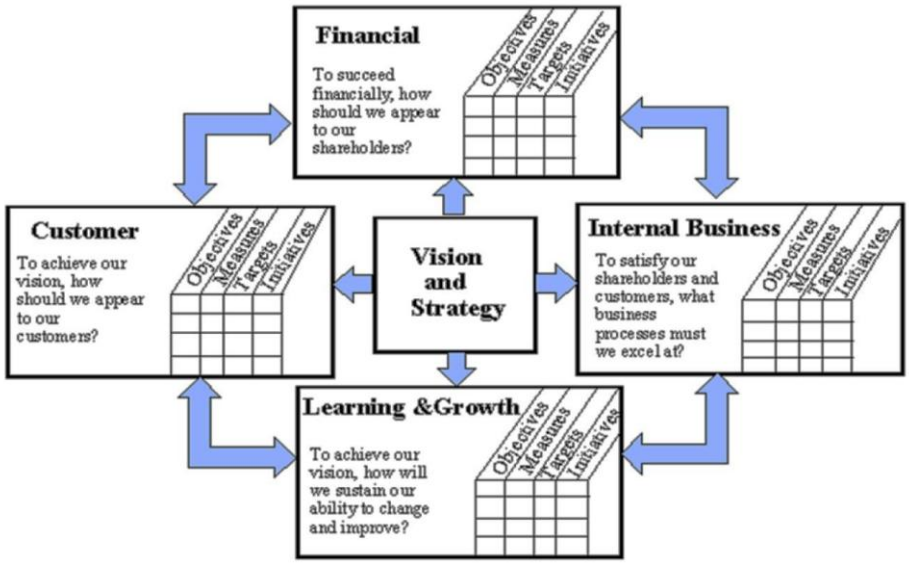
Scorecard has been adopted by nearly half of the Fortune 1000 organizations and the Harvard Business Review recently hailed it as one of the 75 most influential ideas of the twentieth century.

2.1. Balanced scorecard characterization

The balanced scorecard is very simple tool which translates a strategy into action from four different perspectives (Grasseova 2010):

- Financial Perspective involves financial objectives of an organization and it helps managers to monitor financial success and values for shareholders.
- Customer Perspective consists of objectives such as customer satisfaction, share and attributes of products and services.
- Internal Processes Perspective involves internal objectives and results of key processes necessary for customer perspectives accomplishment.
- Learning and Growth Perspective concerns intangible drives of future success, for instance human resources, organizational capital and information capital including skills, learning, organization culture, leadership, systems and database

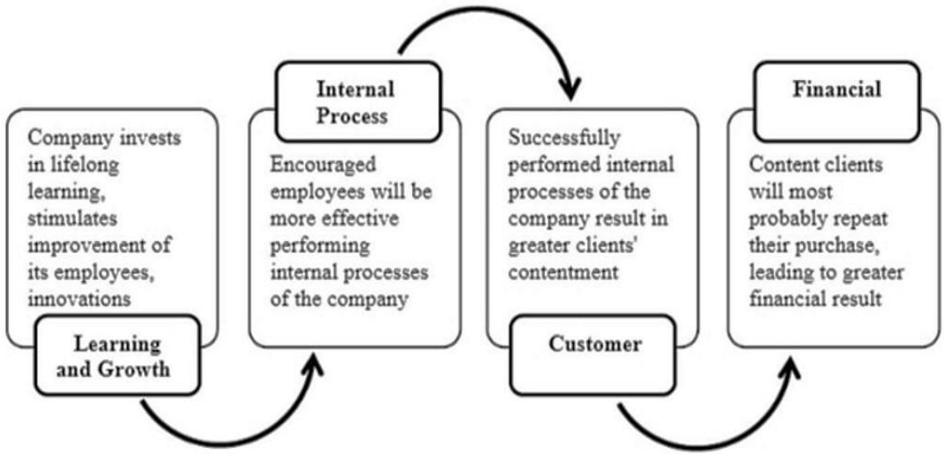
FIGURE 1**:** BALANCED SCORECARD FRAMEWORK



Source: Kaplan, R. and Norton, D. 1996. The Balanced Scorecard. Boston: Harvard Business School.

The basic idea of balanced scorecard concept is that performance measured in learning and growth perspectives directly influence performance in internal processes perspective. Companies which invest a lot into learning and growth will have internal processes performance acceptable for all stakeholders. Successful internal processes performance will lead to client's satisfaction which will lead to positive financial results.

FIGURE 2: CAUSE-EFFECT INTERACTIONS OF BALANCED SCORECARD'S PERSPECTIVES



Source: Čizmić, E. and Veselinović, Lj. 2007: National Balanced Scorecard Concept as an Accelerant of Bosnia-Herzegovina's Economic Development.
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Measurable goals and objectives are one of the key success factors of making strategy work (Galpin, 1997). The Balanced Scorecard allows an organization to translate its vision and strategies by providing a new framework, one that tells the story of the organizational strategy through the objectives and measures chosen in four perspectives (Niven, 2003).

Although BSC was originally developed as measurement system, it evolved to strategic management system for aligning short-term actions with the strategy in organization. Used in this way BSC relieves many of barriers of effective strategy implementation. Those barriers are (Niven, 2003):

- The vision barrier through the translation of strategy
- People barrier

- Resource barrier
- Management barrier

The Balanced Scorecard is also very powerful as communication tool because it is translating the strategy and describing it to all employees. If they understand organizational strategy, employees know where the organization is headed and how to make contribution in order to realize the strategy.

3. THE BALANCED SCORECARD FOR PUBLIC SECTOR

Although the Balanced Scorecard was originally developed for commercial organizations, the concept found widespread use in the public sector organizations as a performance management tool. The performance measurement has become an important issue for managers in dynamical operating environment of the present public sector organizations.

In modern public organizations measuring performance is crucial to achieve sustainable public finance and to get public's confidence. Measuring performance is a key of monitoring and managing organization's processes. It is a permanent activity which checks the performance against the standards that have been settled to be followed. Irish mathematician and physicist Lord Kelvin said:" When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind (Niven, 2003)."

It is very important for public sector organization to establish clear objectives and to develop strategy to reach those objectives. By measuring performance success in reaching objectives can be defined. Performance measurement in public organizations is possible, but slightly complicated compared to the private sector because the private enterprises' performance is measured based on the companies' financial performance while public organizations measure performance based on results of budgeted funds for their activities (Talbot, 1999).

According to De Brujin (2007) performance measurement in public organizations can be problematic for several reasons:

- Products have multiple values
- The environment is dynamic
- Products are produced together with others
- Organizations are process-oriented

- Products are interwoven
- Causalities are unknown
- Quality is not definable in performance indicators
- Definition of "customers"

The Balanced Scorecard has become a very popular as a proven tool for performance measurement and executing strategy in public sector organizations. Public sector is different from private sector in many ways and for successful implementation of the balanced scorecard, there is significant amount of translations required to convert the language of private sector into terms that are appropriate for non-profit and governmental organizations (Arveson, 1999). The following table illustrates differences between public and private sector.

TABLE 1: COMPARING STRATEGY IN PRIVATE AND PUBLIC-SECTOR ORGANIZATIONS

Strategic Feature	Private Sector	Public Sector
General Strategic Goal	competitiveness	mission effectiveness
General Financial Goals	profit; growth; market share	cost reduction; efficiency
Values	innovation; creativity; good will; recognition	accountability to public; integrity; fairness
Desired Outcome Stakeholders	customer satisfaction stockholders; owners; market	customer satisfaction taxpayers; inspectors; legislators
Budget Priorities Defined by:	customer demand	leadership; legislators; planners
Justification for secrecy	protection of intellectual capital; proprietary knowledge	national security
Key Success Factors	growth rate; earnings; market share; uniqueness; advanced technology	best management practices; sameness; economies of scale; standardized technology

Source: Arveson, P. 1999. Translating performance metrics from the private to the public sector. http://www.balancedscorecard.org. Accessed 3 January 2017.

The main difference between private and public sector organizations is that first are strategy oriented while the public sector organizations are mission oriented (Jovanović; Krivokapić; Soković; Vujović; Ramović, 2011). According to the same authors in public sector moving from the top of the Balanced Scorecard we get to the client perspective not to the financial perspective like in private sector organizations. The differences for every perspective of profit and public organizations are shown in the following table.

TABLE 2: THE DIFFERENCES OF PROFIT AND PUBLIC ORGANIZATIONS

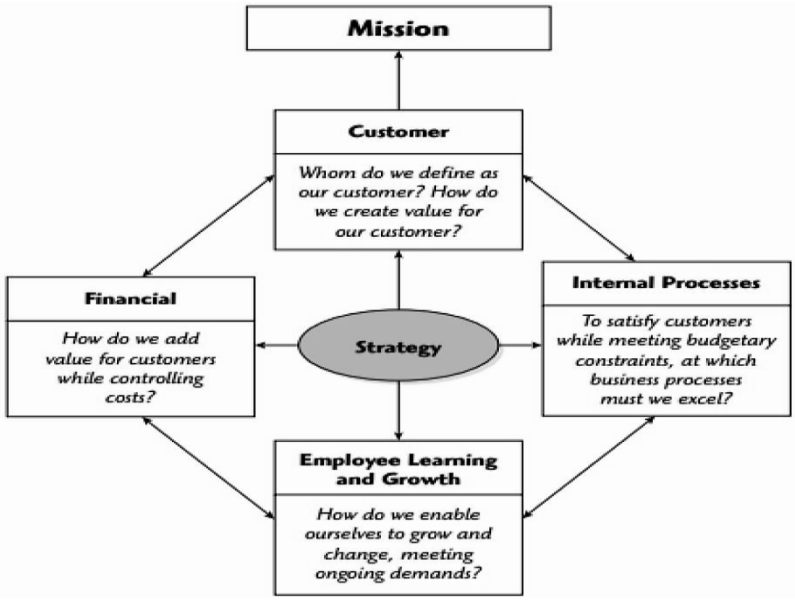
	Profit organizations	Non-profit organizations
Financial	financial success	fulfil mission
Customer	customer satisfaction	predict the interest of users
Internal Processes	optimize business processes	increase the effect of the process
Employee Learning and Growth	plan the total resources of the organization	knowledge management

Source: Jovanović, J. and at al. 2011. Sistem strateškog menadžmenta. Balanced scorecard. Vrnjačka Banja: SaTCIP.

The "geography" of the original Scorecard must be adopted to fit to public sector organizations how it would facilitate a rapid and dramatic transition of twenty-first century.

Kaplan and Norton (2001b) suggest that BSC can be adapted for use in public sector organizations simply by rearranging the scorecard to place customers at the top of the hierarchy. The following figure illustrates the Balanced Scorecard model that is applicable to public organizations.

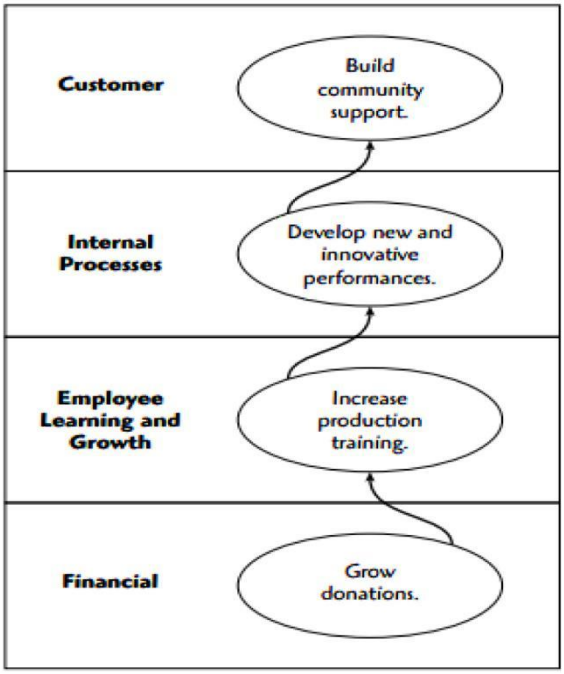
FIGURE 3: BALANCED SCORECARD FOR THE PUBLIC AND NON-PROFIT SECTORS



Source: Niven, P. 2003. Balanced Scorecard Step-by-Step for Government and Nonprofit Agencies. John Wiley&Sons, Inc.

Mission moves to the top of the Balanced Scorecard for public organization but strategy remains at the core of the Scorecard system, whether it is a private or public sector organization. In public organizations focus is on meeting customer requirements because this is the essence and mission of each public organization. The financial perspective in public organizations is only basis for the fulfilment of customer requirements. So indicators should be elected in the way that all of them are connected with the goals of customer perspective. The cause and effect of all BSC indicators must be connected to financial objectives in private sector organization but in public organizations cause and effect of all BSC indicators must be connected with the objectives in customer perspective.
A well designed BSC concept should describe the strategy of organization through the objectives and measures that have been chosen and these measures should link together in a chain of cause and effect relationships from the performance drivers in the Employee Learning and Growth Perspective all the way through to improved customer outcomes in Customer perspective (Niven, 2003).

FIGURE 4. CAUSE-EFFECT INTERACTIONS OF BALANCED SCORECARD'S PERSPECTIVES IN PUBLIC ORGANIZATIONS



Source: Niven, P. 2003. Balanced Scorecard Step-by-Step for Government and Nonprofit Agencies. John Wiley&Sons, Inc

3.1. The Balanced scorecard in the Australian Bureau of Statistics (ABS)[17]

The Australian Bureau of Statistics (ABS), Australia's National Statistics Office is using the Balanced Scorecard to measure client servicing for its four client segments (key/lifeline clients; specialist sectors such as media, education and libraries; professional/regular clients and hoc clients).

They adapted orginal scorecard dimensions to match the particular circumstances of the ABS even though the four key perspectives were retained. Mission of the ABS is to assist and encourage informed decision making, research and discussion within governments and the community, by providing a high quality, objective and response national statistical service. To achieve their mission, the crucial identified ingredients are an effective dissemination of statistics and quality service to four identified segments of clients. The ABS adopted a balanced scorecard framework to assess and measure how well their clients are serviced.

The balanced scorecard in ABS has four components which engird four critical perspectives of client service:

1. The Client perspective

The key performance inadicators are:

- client satisfaction
- their „purchasing" intentions of ABS products and services

2. The Financial perspective

The key performance inadicators are:

- the extent to which ABS complies with Government pricing policy of 100% cost recovery
- the ABS „unit" costs for the dissemination and creation of products and services

3. The Staff perspective

The key performance inadicators are:

- professionalism
- accuracy of results provided
- timeliness of response

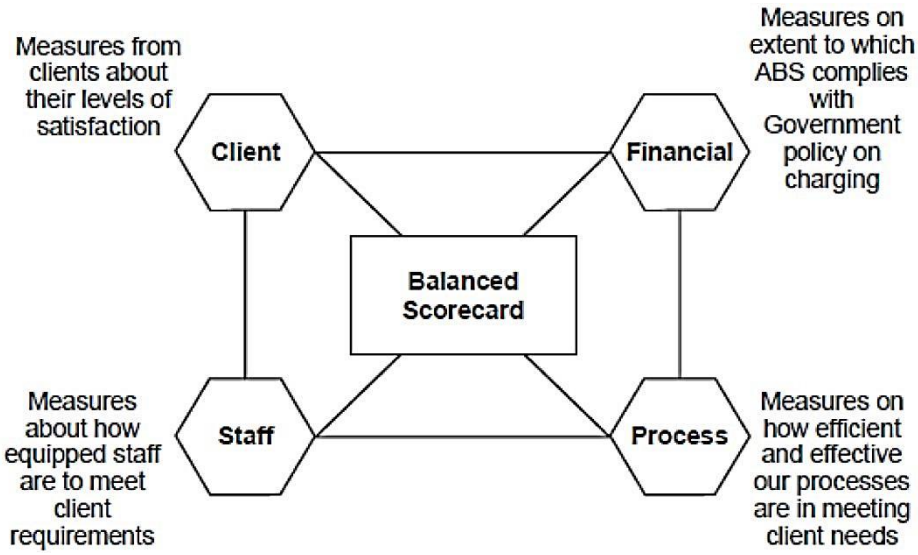
4. The Process perspective

[17] More about The Balanced Scorecard in the Australian Bureau of Statistics (ABS) see at Dickinson, T. and Tam, S.M. 2004. Measuring client servicing in the Australian Bureau of Statistics (ABS) – a balanced scorecard approach. *Statistical Journal of the United Nations ECE*, 21: 7-16.

The key performance inadicators are:

- timeliness of ABS outputs, including publications and confidentalised unit record files
- number of corrigenda issued, number of releases withdrawn and number of unadvertised outputs released
- the response time to calls to their national enquiry centre
- the time taken to respond to clients queries, the time taken to quote and delivery performance against agreed dates in their information consultancy services

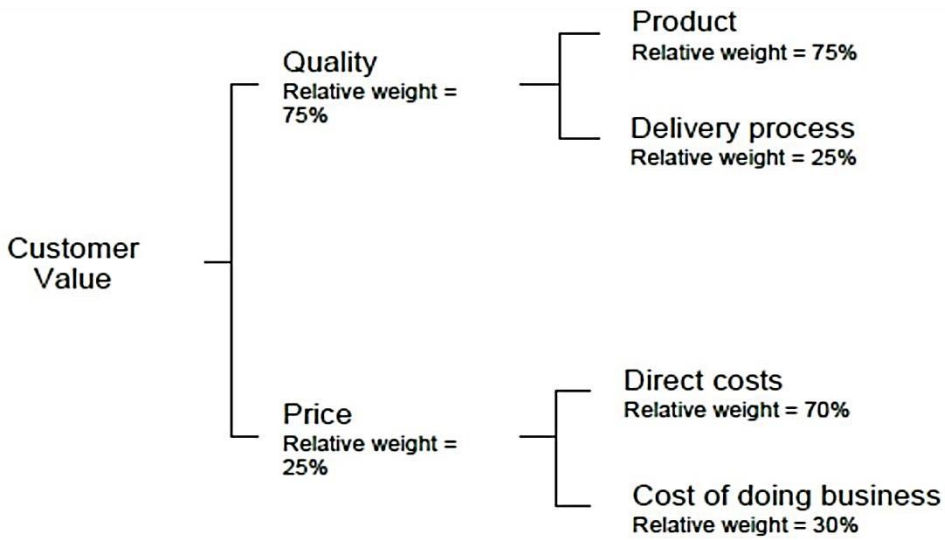
FIGURE 5. THE ABS CLIENT SERVICE BALANCED SCORECARD



Source: Dickinson, T. and Tam, S.M. 2004. Measuring client servicing in the Australian Bureau of Statistics (ABS) – a balanced scorecard approach. *Statistical Journal of the United Nations ECE*, 21: 7-16.

In 2003 the ABS commissioned a study which suggested that the value driver map for ABS products and services as perceived by clients (the client perspective) includes quality and price dimension which are driven by the value attributes of ABS products/services , delivery processes (the Process and Staff perspectives), direct costs and costs of doing business with the ABS (the Financial perspective).

FIGURE 6. CUSTOMER VALUE DRIVER MAP FOR ABS PRODUCTS AND SERVICES



Source: Dickinson, T. and Tam, S.M. 2004. Measuring client servicing in the Australian Bureau of Statistics (ABS) – a balanced scorecard approach. *Statistical Journal of the United Nations ECE*, 21: 7-16.

According to ABS's expirience of using the Balanced scorecard approach, making the performance indicators available to client servicing staff, discussing the indicators with staff and seeking suggestions for further improvement of performance can make positive influence to client servicing staff. Also, they found very imortant constant reviewing and if it is necessary, evolving the basis on which the performance indicators are compiled.

3.2 . The Balanced Scorecard in Statistics Finland[18]

Statistics Finland adopted BSC as its strategic management tool in 1998 - 2000 as an excellent instrument highly compatible with a total quality management (TQM) which they adopted and applied before. One of the ways in which they

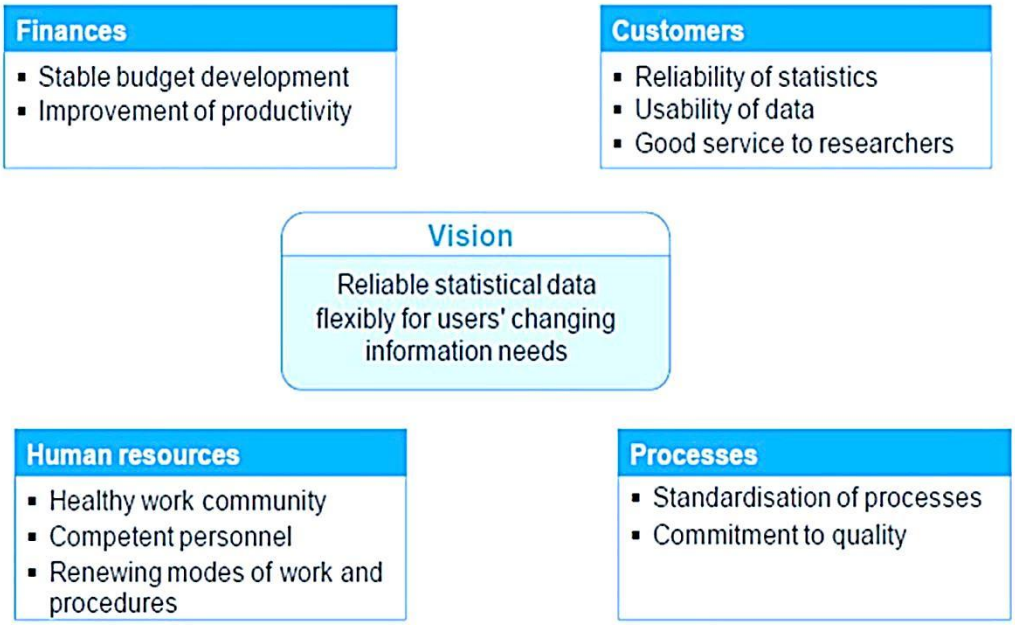
[18] More about the Balanced Scorecard in Statistics Finland see at Jeskanen- Sundström, H. 2007. Needs for change and adjusting to them in the management of statistical systems. Statistical journalof the IAOS, 24:85-91 and STATISTICS FINLAND'S PLANNING DOCUMENTS: Strategy document 2012 to 2015, https://tilastokeskus.fi/org/tilastokeskus/tulossopimus_2014_en.pdf. Accessed 4 January 2017.

use BSC is to draw up the strategy. They found essentially to develop activity in a balanced way so that the objectives applying to finances, personnel, process influence and customer needs can all be met simultaneously.

During the strategy period their special focus is on improving usability of data, harmonising operating modes, renewing modes of work and procedures and achieving stable budget development. Every of ten strategic objectives for the planning period has one or several critical success factors in which they have to be successful in order to achieve the objective.

The BSC-based management system should be integrated into the organization's overall annual and long-term economic planning and monitoring process (Jeskanen- Sundström, H., 2007). According to the same author the performance management system applied in Statistics Finland since 1992 has been fully integrated into the starategic management system based on BSC. According to the expirience of Statistics Finland, the modern management tools including the Balanced Scorecard can significantly help statistical institutes to meet the 21th century challenges and manage necessary changes.

FIGURE 7. THE BALANCED SCORECARD IN STATISTICS FINLAND



Source: STATISTICS FINLAND'S PLANNING DOCUMENTS: Strategy document 2012 to 2015, https://tilastokeskus.fi/org/tilastokeskus/tulossopimus_2014_en.pdf. Accessed 4 January 2017.

3.3 . The Balanced Scorecard – instrument of strategic planning in National Institute of Statistics Romania[19]

The National Institute of Statistics in Romania created the BSC based on the Strategy of developing the national statistical system for 2007 - 2013 periods. Linkage between mission, values, vision and strategy was starting point for creation four perspective, objectives and indicators of BSC for Romanian Statistics. The original BSC architecture could not be kept. The order of perspectives was changed to: users, internal processes, staff and innovation and financial. The system of indicators for every objective in four perspectives of BSC in the National Institute of Statistics in Romania is shown in the Table 3.

TABLE 3. THE SYSTEM OF INDICATORS FOR EVERY OBJECTIVE IN FOUR PERSPECTIVES OF BSC IN THE NATIONAL INSTITUTE OF STATISTICS IN ROMANIA

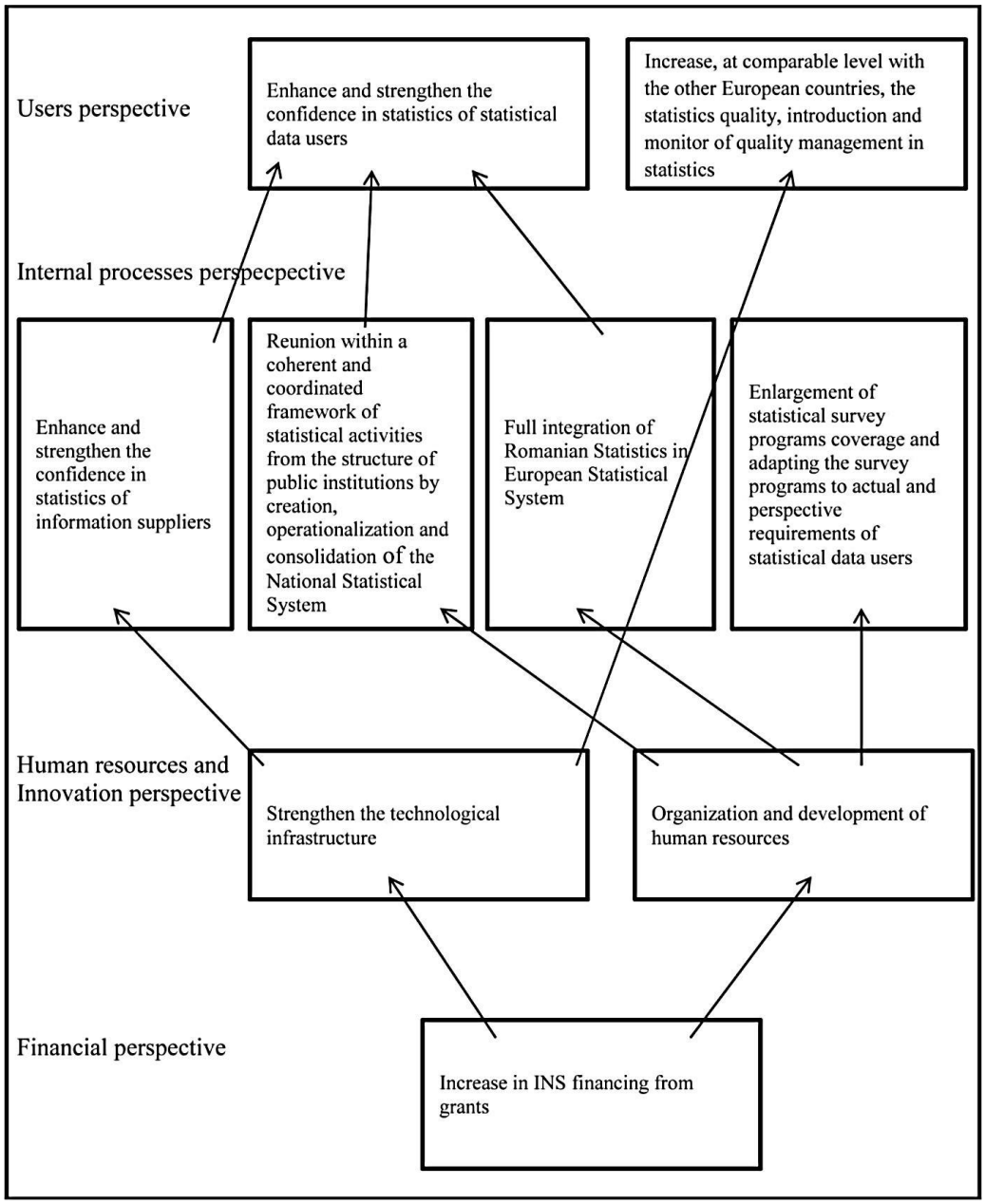
	OBJECTIVES AND INDICATORS FOR EVERY OBJECTIVE			
Users perspective	1. Enhance and strengthen the confidence in statistics of statistical data users Indicators: • Number of publications sold on paper support and CD • Number of data requests • Number of database access (publications and data series) • Number of analyses and studies carried out by National Institute of Statistics		2. Increase, at comparable level with the other European countries, the statistics quality, introduction and monitor of quality management in statistics Indicators: a. Relevance • Available statistics rate b. Accuracy • Variation coefficient • Response rate • Imputation rate • Average number of revisions c. Punctuality and opportunity • Punctuality of programmed time for effective publication • Time interval between reference period and first results date • Time interval between reference period and final results date	
Internal processes	1. Enhance and strengthen the	2. Reunion within a coherent and	3. Full integration of Romanian	4. Enlargement of statistical survey

[19] More about the Balanced Scorecard in National Institute of Statistics Romania see at Ştefănescu, D. And Silvestru, M. 2012. Balanced scorecard – instrument of strategic planning. *Romanian statistical review*, 2.

perspective	confidence in statistics of information suppliers Indicator: • Response rate of information suppliers	coordinated framework of statistical activities from the structure of public institutions by creation, operationalization and consolidation of the National Statistical System Indicator: • Response rate by web portal • Response rate by CAPI • Response rate by Internet	Statistics in European Statistical System Indicator: • Number of surveys according to ESS requirements	programs coverage and adapting the survey programs to actual and perspective requirements of statistical data users Indicator: • Number of statistical surveys
Human resources and innovation perspective	1. Strengthen the technological infrastructure Indicators: • Number of compatible information applications • Enlargement of database system coverage		2. Organization and development of human resources Indicators: • Weight of young generation in total employees • Average work period of an employee within the National Institute of Statistics • Number of courses per employee	
Financial perspective	1. Increase in INS financing from grants Indicator: • Increase in value of grants			

Source: Based on Ştefănescu, D. and Silvestru, M. 2012. Balanced scorecard – instrument of strategic planning. Romanian statistical review, 2.

FIGURE 8. THE STRATEGIC MAP FOR ROMANIAN STATISTICS



Source: Based on Ştefănescu, D. and Silvestru, M. 2012. Balanced scorecard – instrument of strategic planning. Romanian statistical review, 2.

According to Magretta (2002) the best told stories help every employee see what the organization is trying to accomplish and how they fit into that context. The

Balanced Scorecard is an excellent and proven tool to tell strategic story of any organization. Through a series of interconnected objectives and measures running through the four perspectives, well-constructed Scorecard should describe how organization works and what is crucial to success (Niven, 2003).
In the National Institute of Statistics in Romania, strategic map was created to display performance objectives graphically. It is a one-page document that gives a clear and succinct display what they believe is most critical for executing their strategy. "Strategy implies the movement of an organization from its present position to a desirable but uncertain future position. Because the organization has never been to this future place, the pathway to it consists of a series of linked hypotheses. A strategy map specifies these cause-and-effect relationships, which makes them explicit and testable (Kaplan and Norton, 2000: 167-176)." Figure 8. displays the strategic map for Romanian Statistics as a representation of cause-and-effect linkages among the performance objectives through the four perspectives, making the strategy story easy to read, understand and share with others.

4. CONCLUSION

The purpose of the paper was to look at the Balanced Scorecard as a modern management tool and whether it is applicable in official statistics. BSC was implemented in several national statistical institutes of EU member states (Finland, Hungary, Latvia etc.) and in the Australian Bureau of Statistics (ABS). Findings of this paper are that modified BSC is applicable in statistical institutes and can help them to face the challenges in this fast changing environment, manage necessary changes to satisfy all stakeholders and face with increased demands for high quality information.

Institute for Statistics of the Federation of Bosnia and Herzegovina in three - year work plan for the period 2017 - 2019 formulated its mission, values, vision and strategy. Connection between mission, values, vision and strategy should be the basis for creation four perspectives, objectives and indicators of BSC for Institute for Statistics of the FB&H. Applying BSC in the Institute for Statistics of the FB&H would decode its mission, values, vision and strategy into performance objectives and measures in each of the four perspectives and ensure all employees are aligned with and working according to the mission. From its mission statement it is quite obvious the major emphasis of the Institute for Statistics of the FB&H is with its data users and stakeholders so adoption of BSC framework would allow the Institute for Statistics of the FB&H to measure its

performance in order to assess and measure how well serviced are its data users and stakeholders.

In this paper we showed three models of the balanced scorecard concept in statistical institutes. Institute for Statistics of the Federation of Bosnia and Herzegovina should develop its own model by adapting the original Scorecard to match its particular circumstances. A special challenge for the Institute would be to develop outcome measures for every of ten cantonal offices within the Institute and tie these measures to the strategic objectives of the Institute.

Institute for Statistics of the Federation of Bosnia and Herzegovina set a goal to implement Total quality management (TQM) to follow and improve quality of statistical processes and products. Organizational BSC is a natural follow up to the use of TQM principles because TQM does not consider employees in its search for continuous improvement but the BSC does. Therefore, by adopting a BSC an organization that has adopted TQM may overcome this oversight which should increase employee satisfaction and subsequently organizational performance. Statistics Finland adopted BSC as its strategic management tool as an excellent instrument highly compatible with a total quality management (TQM) which they adopted and applied before.

So, the best we can do is to learn from others experiences.

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UPOTREBA BALANCED SCORECARD – A KAO MENADŽERSKOG ALATA U STATISTIČKIM INSTITUCIJAMA

Abstract

U vremenu u kojem živimo, globalizacijski procesi te brze društvene, ekonomske i demografske promjene nametnule su službenoj statistici povećan pritisak da svojim korisnicima pruža pouzdanije, kvalitetnije, relevantnije i međunarodno uporedive podatke. Primjena savremenih menadžerskih alata može pomoći statističkim institucijama da se suoče sa ovakvim izazovima. Odličan menadžerski alat je Balanced Scorecard model kao dokazan alat za postizanje boljih performansi i učinkovitosti u privatnom i javnom sektoru. Svrha ovog rada je osmotriti Balanced Scorecard i utvrditi na koji način se ovaj alat može primijeniti u službenoj statistici. Metodologija rada temelji se na postojećoj literaturi o BSC sistemu i izvještajima o primjeni BSC modela u drugim statističkim institucijama. Utvrđeno je da modificirani BSC može pomoći statističkim institucijama da se suoče sa izazovima u svom turbulentnom okruženju te upravljaju potrebnim promjenama kako bi zadovoljili sve zainteresirane strane i osigurali kvalitetne informacije.

Ključne riječi: *Strateško upravljanje, Savremeni menadžerski alati, Službena statistika*

JEL klasifikacija*: C40, C80, E01*

STUDENTSKI RADOVI

STUDENTS PAPERS

THE EFFECT OF CAPITAL FORMATION ON ECONOMIC GROWTH IN IR IRAN: TESTING VARIOUS THEORIES WITH AN ARDL MODEL

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Rezime

Purpose of the research: This paper examines the relationship between capital formation and economic growth in IR Iran during the period 1974-2014. Considering unique structure of Iranian economy developed by five-year plans under certain period of sanction, we should compare different economic growth theories (marxian, keynesian and neo-classical). With respect to second larger oil producer (even in mentioned condition) we could simplify analysis on theories validation on single factor economy, but the main focus still remaining on possibilities of structural reforms and impact of capital formation.

Methodology: We use 7 variables grouped in main factors in growth models – capital, labor and technology. For establishing short and long-run equilibrium to explain effects on GDP pc we deployed ARDL model. For testing stationary of variables under ARDL we use AFD (Augmented Dickey-Fuller) test. All variables was taken in form of logarithm show as non-stationary on first difference. Since FDI inflow has some negative values, we added new variable to complement results. As dummy variable we use periods 1978-1988 which represent Iraq-Iran war, and 2004-2014 as period of tightened economic sanction. ARDL models are selected by AIK and SIC criteria, with more precise results with SIC.

Results: Our model is long-run model that examine capital formation to economic growth. As capital from external sources we choose realization of export of goods and services, where 1% increase lead to 0,29%, while net FDI inflow shows significance but low impact (-,025). Internal sources of capital boost economic growth gross fixed capital formation by 0,27%, while other variable shows insignificances. Highest significance shows labor force with the same high negative effect, greater than all capital variables together. This should suggest high insufficient of capital in IR Iran.

***Keywords**: Strategic management, Modern management tools, Official statistics*

***JEL classification**: C40, C80, E01*

Background

Almost all-economic theory of economic growth has been determined Harrod-Domar Model. These models include: a simple Keynesian macroeconomic growth model, Leontief's Input/Output model, the social accounting matrix, general equilibrium models, and cost benefit analysis approach. Intellectual progress in the development of theoretical and empirical views on economic growth keep pace with the improvment of economic mathematical tools that can process data. In general, forecasting models can be subsumed into three branches: causal forecasting, econometrics/ regression/correlation, trend analysis, and qualitative forecasting.

The second generation of the new growth theory, especially based on endogenous technological progress trying to find in some cases, new variables in their model like inflation, foreign direct investment etc. But we should not rely on growth accountiung, as it does not give very accurate estimates of total factor productivity. Regression analysis as alternative method was taken as general methodology to measure the impact of various factors and decompositions of the factors of production. Most empirical research were presented with regression equation through a set of exogenous factors that affect economic growth. These studies generally considered causality in one direction, while ignoring the majority of endogenous factors.

This work can not provide a comprehensive review of theoretical and empirical stuides of economic growth. It is tried to check factors which could support our empirical research. Classicists believe that the interaction between accumulated capital and technological proccess can determine the long-term economic growth, while modern theories attempt to explain the combination of many factors.

The macroeconomic modelling in Iran

Macroeconomic modelling in Iran has origin since 1971 when Habib-Aghai (1971) introduce in practice of Planning Budget Organisation. This model has been started with 8 linear-bihavioral relationship and 7 accounting variables in 3 categories. Vakil (1973) using two sectoral model respecting alternative classical theoretical approach for developing countries of Lewis (1954) and Fei and Ranis (1964). From this approach they developed two behavioral equation of rural and urban consumption functions as well as private and governement sector. These models investigating short-term series 1959-1970 and 1961-1975, using R2 and t

statistics. Keysian demand approach were use Shahshamani (1978) and Heira (1986) without any practical use but with great impact on further economic planning. Both model used OLS and 2SLS methods. Shahshamani (1978) add basic precumption of interaction between monetary and the real sector.

After the end of the Iran-Iraq war with efforts for rehabilitation of the economy, particularly development planning, macroeconomic models again gained importance. The way of adoption these five-year development plans, restricted macroeconomic modeling and caused delay in the formation of the first five-year development plan (1990-1994). The second five-year plan was based on two models. The first contains 25 econometric estimates of behavioral, technical and institutional relations and accounting identity. Method of least squares was used for period 1974-1993. The structure is based on Keynsian model income-consumption, production modul and factor demand with investment consumption derived for 10 main sectors and aggregate price equation.

Noferesti and Arabmazar (1993) and Valadkahni (1997) developed model in which aggregate supply is not perfectly elastic. Agregate demand has been translates from sectoral value added incorporated in a conversion matrix.

Empiric literature rewiew

Using ARDL model of vector autoregression has been folowed by many researchers but in vary discutabily usage. Gratest achivement is macoeconomic model of Esfahani, Mohaddes and Pesaran (2009) which has been folowed by achivements in ARDL modelling. They explainig long run economic growth trough real production, CPI, exchange rate, money and broad money, export and prices of oil as well as population, exporters of oil extending this effects of oil recources. It's first research including quartile data with international relationship. Pahlavani, Wilson & Worthington (2005) results shows great GDP of Iran significanly lead by effectrs trhouh gross capital formation and oil export by Bayesian Model Averaging (BMA). As less importance shows non-oil export and human capital. Deviation from long term growth is 40-60%- in the following year. Mehrara & Rezai (2015) shows importance of government investment, capital goods and intermediateee. Half-products. Pahlavani & Rahimi (2009) on time series until 2006 approve significance on imported inflation. Khosravi & Karimi (2010) take same series and approve monetary and fiscaly politics on economic growth explainig trought inflation and real exchange rate with his negative corelation.

Some authors using export and import as explainable trouhg opennes and egzonegus shocks by fluctuating inflation and real exchange rate. Samimi, Ghaderi & Sanginabadi (2011) and Salimifar, Razmi & Taghizadegan (2015) finds negative corelation in oppennes and inflation. Naji Meidan & Zabihi (2012) finds that openness has positive impact on income and eqalitiy. Mohammedvandnahidi, Jaberikhosroshahi & Noruzi (2012) inspect FDI by oppennes and real exchange rate. They find high siggnificance over long period. Simmillary Pahlavani & Rahimi, (2009) Yazdi & Shajari (2009) use same dummy variable of Iran-Iraq wars and find signifficance. Zohoori & Nezhad (2015) who intraduces full ARDL test to approve that government expenditures has positive influence on economic growth. Ghorbani & Zarea (2009) with the smaller sample and simplier test show instead netural. Some authors Majidi (2013) finds that government size (government expenditures) and inflation has negative impact on oppeness investigating FDI.. Dizaji & van Bergeijk (2012) investigating government size and export shows that oil revenue provides some 80-85% export earnings and 40%-80% government revenue.

Kohansal, Torabi & Dogani (2013) concluded existance of long-term realtionship between economic growth and productivity in manufacturing sector. Monetary sector has been investigated by Mehrara & Musai (2012), and showed financial growth and capital stock has resposible for growth of real GDP. Yazdan & Seyed Mohammad Hossein (2012) also investigate monetary variables finding that growth of GDPpc has lead by developing of (islamic) banking sector and capital fixed formation confirming double relationship.

ARDL model

We will use ARDL mode

ls designed by Pesaran and Shin (1999) and later upgraded by Pesaran et.al. (2001) for econometric analysis. ARDL test has several advantages over standard cointegration tests of Engle-Granger (1987), Johansen and Juselius (1990) and Johansen (1991). Using ARDL model it is possible to get more accurate relationship of cointegration on small samples, since Johansen test requires great series to validate accuracy. Regressor do not have to be of the same order to implement the integration test, which allow us to avoid problems in the testing process variables that are associated with the standard cointegration tests (Pesaran, Shin and Smith, 2001). This technique provides unbiased assesment of long-term model demonstrating the validity of F-test even when some of the regressors are endogenous. In other words difference between the unit root regressors is integrated. Also, variables can have different optimal lags, as well as multiple dummies variables, which is impossible with standard tests.

Given the fact that ARDL belongs to group of vector autoregressive models, error correction model which represent re-parametrization can be derived from it. Long term coefficients in equation are listed as an index adjustment variables to steady state. They are explaining co-integration for in short term. The basic condition for the acceptance of this equation is the existence and significance of the negative sign after differentiation.

Using of ARDL model in policy recommendation is still under question mark, but forming reliable long-term models could give us clearer picture of economic growth dynamic. Respecting results from empirical rewiew we could izvući common facts that influenced on our work:

- Dominant role of oil which has been represented in many models by intraducing simple two sector model
- Further impact on inflation, real exchange rate are avoided since these variables are directly corelated with and goverment spending which are mostly determined by shocks of oil export and oil prices, even in add value of production.
- Significance enrollement of goverment ownership over economy, which can be measured by only by to semi-conducted sectors, governemnt spending and added value of production.
- Agregat productivities devided to show private and state capital formation
- Differencing political stages trough dummies

Model

Investigating for economic growth factors of IR Iran we take time series from 1974-2014. Dependent variable is set to be GDPpc as representation of economic growth. Value added trough production and services could be taken as variable for agregat productivity in this sectors. Since structure of this sectors are mostly different, it could be good comparation for state-owned (production) and private sector (services). Percent of realisation on foreign market trough export is less than 20%, so we could see this parametar as internal realisation of value adedd. Gross fixed capital formation should give us picture of importance investing in equpment and machinery.

Real exchange rate and inflation recogised as main destabilisating factors of prices express their influence trough export and goverment expenditures. Creating capital from internal sources trough domestic credits are rigid as financial sector, and we assume that monetary creation could be representated in

real assets trough gross fixed capital formation and value aded of sectors. General government consuption are included to explain role of state in keeping economic growth.

FDI as external financial capital source has been added as pure monetary realisation of capital into domestic economy. Also grants of technical cooperation could represent supstitute for FDI as variable that could show as direct impact of technology transferable skill during sanctions. These two variables are summed, since FDI has some negative values, and both has relativly low values.

Labor force has been choosen in order to examine dynamic of human capital in economic growth of Iran, rather then population variable as classical model suggest.

All authors used a single methodology taking period durring Revolution 1979 until end of war with Iraq, as dummy variable. We choose to test period form 2004-2014 as period of non-prosperity in terms of clear prospectus for growth. We also present both model in our paper in order to conclude that our model functioning well under sanction period, while other does not respect the facts of sancitons. Different variables in this model has been choosen to simplify effects.

GDPpc	
○ Export of goods and services	**EXP**
○ FDI **+** Grants of technical cooperation	**FDI**
○ Gross fixed capital formation	**GFCF**
○ Value added of production	**VAP**
○ Value added of services	**VAS**
○ General government final consumtion	**GGFC**
○ Labor force	**LF**

Empirical results

First step should we conduct in model testing is using Augmented Diceky-Fuller test to check stationarity of variables, even it is not nececary since ARDL could recognised variables different row of stacionarity, i(0) I(1). Results of test we compared to marginal values of interception according to Pesaran et. al. (2001). Labor force shows that stationarity should be taken at level 5%, while others are siggnificance at level of 1 %.

Variables	Lag	Critical value	Intercept	Linear test p

GDPpc	0	-4,205004	-4,395626	0,0061
EXP	0	-4,205004	-4,492780	0,0047
FDIin	0	-4,205004	-5,763332	0.0001
GGFC	0	-4,205004	-5,549265	0,0003
GFCF	0	-4,205004	-4,620285	0,0034
VAP	0	-4,211868	-4,645738	0,0025
VAS	0	-4,205004	-4,101433	0,0130
LF*	1	-3,533083	-3,595036	0,0533

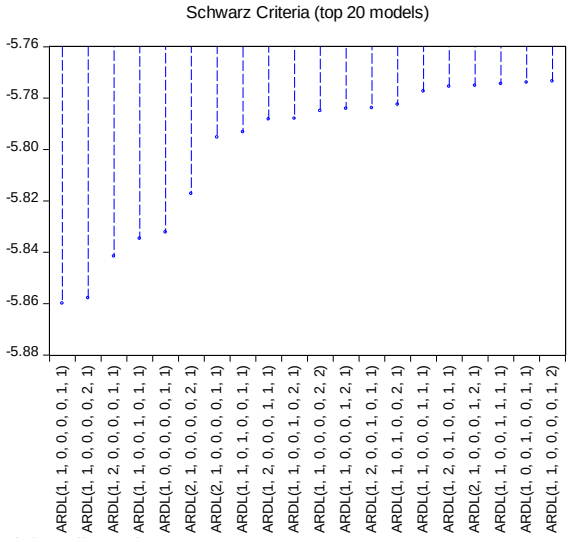
*At level 5%

After checking stationarity test, we can form ARDL eqasion. Dependent variable is GDPpc. We empoloyed dwo dummy variable which suggest cycles in politics and economic prosperity. D1 representnig dummy variable used in other many publications from 1979-1988, representing Iran-Iraq war. D2 was intraduces same dummy variable to period of 2004-2014 where tightened sanction to Iran. Model could be represented by eqasion

$$LGDPpc = \alpha_0 + \sum_{I=1}^{p} \lambda_1 LGDPpc_{t-i} + LFDI_{t-i} + \sum_{t=0}^{q_5} \lambda_2 LGGFC_{t-i} + \sum_{t=0}^{q_6} \lambda_2 LGFCF_{t-i} + \sum_{t=0}^{q_7} \lambda_2 LEXP_{t-i} + \sum_{t=0}^{q_9} \lambda_2 LVAP_{t-i} + \sum_{t=0}^{q_{10}} \lambda_2 VAS_{t-i} + \sum_{t=0}^{q_{11}} \lambda_2 LF_{t-i} + D1 + D2$$

Optimal lag estimation of variables in model we tested by Schwarz Information. Number of observation testing optimal lag is determined by $(p+1)k$ (where p is maximum number of lags, k – variables of model. Pesaran et al. (2001) said tahat optimum lag of data on annual bases is 2. After 4374 models evaluated selected model which are presented in table has been choosen with graphical representeation of 20 best models on SIC criteria. Lagged variables are GDPPC, EXP, VAP and VAS in that order.

Optimal lags model by SIC	
1,1,0,0,0,0,0,1,1	
R^2 = 0,999230	AIC = -6,476103
= 0,99886	SIC = -5,890981
F = 2696,763	D-W = 2,409227



Graphic1: ARDL models sellected

Also we could see high values for represented tests. Bound tests for all variables are satisfied of test, and we can conclude there for both types of variables, an null hipotesis has been rejected.

Bound test (F-statistic)	
1,1,0,0,0,0,1,1	
8,872425	
Critical values bond	
1% 2,5% 5% 10%	2,89 3,21 3,51 3,9

Now we can form of long run equasion. Our model us parameters for long run:

$$Cointeq = LOG(GDPPC) - (0.2925 * LOG(EXP) + 0.0333 * LOG(GGFC) + 0.2746 * LOG(GFCF) - 0.0253 * LOG(FDI) - 0.7987 * LOG(LF) - 0.0013 * LOG(VAP) + 0.1964 * LOG(VAS) - 0.0027 * SHIFT + 0.0254 * SHIFT1 + 2,3184)$$

Results in Eviews 9.5 StudentLite

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(EXP01)	0.292548	0.093556	3.126980	0.0042
LOG(GGFC)	0.033317	0.060199	0.553447	0.5845
LOG(GFCF)	0.274642	0.042126	6.519594	0.0000
LOG(FDIIN)	-0.025294	0.005552	-4.556076	0.0001
LOG(LF)	-0.798716	0.175563	-4.549468	0.0001
LOG(VAP)	-0.001334	0.145478	-0.009172	0.9927
LOG(VAS)	0.196398	0.069672	2.818883	0.0089
SHIFT	-0.002692	0.033174	-0.081151	0.9359
SHIFT1	-0.025428	0.025535	-0.995807	0.3282
C	2.318367	4.299908	0.539167	0.5942

Discussion

Since we aim to establish only factors of a counry, we will take into account only assumptions concerning the same, with additional categories of historical and political experiences that were the basis for the selection of these variables. Unfortunaltely, this assumption can not be applied to the traditional theoretical framework, and the economic reality in any case is much more complex than the regression which is represented by a single equation.

Dummy variables shows unsignificance in all cases showing prevailance of on external shocks, as a political variable, not only economical. Unsignifficance also show value of production, as well as general government final consumption. Both of these variables show siggnificance of state production module even to discribe economic growth in these surcomstances.

Export show great prevailance over model growth approving fact of high significane. If we take in compare general government final consumption (as unsiggnificant), we assumed from theory and empiric that export has great impact on final dealing and determenimg government consumption.

Gross fixed capital formation show high significance in tecnhology improvement with also high impact. This also can be see from perspective and connection with added value of services. This two variable representing variables of private sector that are mainly connected with constant investment in machinery, as classical permise of investment which mainly missed in government activity. Lowering share in economy, state has announced trough his last fifth-year plan (2016-2021) trought FDI.

FDI and labor otherwise shows signficance but negative correlation with GDPpc. FDI show low negative impact on economic growth showed as expected, Labor, like laged variables with significance taken at level 5%, show signifficance and greatest imact on economic growth. If labor increase a 1% lead to decrease in gross domestic product by 7,9%. High unemployement and intlation are evident, but theoreticly we can assume that is only respond with a changes in transition of Iranian economy. Also we can assume that productivity of labor are significantly lacking by competitors. This could also could be leead by shortage of capital.

Generalization of these models we tried pool all these connection with previous papers and respect all these oppinions. As a result we could present 3 models trought theories. Models based on Cobb-Douglas and other neo-classical theories, Keyensian through planning models that has been used durring recovery economic era between 1989 and 2004. ARDL and OLS modelling of economic growth after 1990 was followth since now are more recognised as modern approach.

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Glavni urednik

Prof. dr Kemal Kozarić

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Dear Authors,

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We would like to use this opportunity to inform you on the several innovations we have made in the Review aiming at positioning of our publication. Second time in a row, our Review will be titled as *Sarajevo Business and Economics Review (SBER)* and you will be invited for submitting your papers twice a year (in January/ February and September/ October). Thus, we are to double the periodicity of our Review which shall appear in October and April editions.

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Until then, receive our kind regards.

Editor in Chief
Kemal Kozarić, PhD