UNIVERSITY OF NIŠ

ISSN 0354-4699 (Print)
ISSN 2406-050X (Online)
COBISS.SR-ID 87230727

FACTA UNIVERSITATIS

Series
ECONOMICS AND ORGANIZATION
Vol. 14, Nº 4, 2017

Scientific Journal **FACTA UNIVERSITATIS**
UNIVERSITY OF NIŠ
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e-mail: facta@ni.ac.rs http://casopisi.junis.ni.ac.rs/

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The cover image design: **M. Ž. Ranđelović**
Publication frequency – one volume, four issues per year.

Published by the University of Niš, Republic of Serbia

Financial support: Ministry of Education, Science and Technological Development of the Republic of Serbia

Printed by "UNIGRAF-X-COPY" – Niš, Republic of Serbia

ISSN 0354 – 4699 (Print)
ISSN 2406 – 050X (Online)
COBISS.SR-ID 87230727

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FACTA UNIVERSITATIS
Series: **Economics and Organization** Vol. 14, N° 4, 2017, pp. 291 - 306
https://doi.org/10.22190/FUEO1704291D

Review Paper

DEVELOPMENT OF SUSTAINABILITY INDICATORS: APPROACHES, CHALLENGES AND OPPORTUNITIES

UDC 502.131.1:339.137.2

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Abstract: *Rapidly changing and complex business environment requires from enterprises to cautiously develop their business strategies in order to achieve and maintain competitive advantage over the long term. With the awareness of importance of environmental consequences and sustainability, market value is no longer determined by single financial performance indicators. The sustainability framework which encompasses economic, environmental and social performances has rather received an international attention of both corporate and financial sector. Even though it is generally accepted that the adoption of sustainability ratios is a most adequate and effective way for sustainability performances' assessment, both the creation/selection of sustainability ratios and their implementation and analysis have been still examined at national and corporate levels. Most companies have adopted the internationally recognized performance evaluation systems (such as Global Reporting Initiative or United Nations Global Compact). Still, there is increasing number of companies that apply self-developed sustainable performance evaluation methodologies. The main purpose of this paper is to investigate the development and application of the performance indicators of sustainable management with the aim to offer suggestions for selection of sustainability ratios the application of which should increase the effectiveness of controlling and decision-making process and would lead to long term competitive advantage.*

Key words: *sustainability reporting, economic, environmental and social performance indicators, GRI Standards, controlling.*

JEL Classification: G30, Q56, M14, M48

Received June 22, 2017 / Accepted September 27, 2017
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INTRODUCTION

Sustainability is an area of growing importance in today's business. The concept of sustainability and sustainability management has attracted a lot of attention during the last decades. Corporate reporting is influenced by this trend too. Numerous challenges, such as global warming, climate change and energy regulation, data protection, resource scarcity, social conflicts and migrations etc., force companies to respect the requirements for sustainability management. The changes in corporate environment have as a consequence the reshaping of investor's (and other interest groups') requirements for information. The retrospective orientation based exclusively on financial indicators/ performances is no longer sufficient to provide and sustain long-term business success and competitive advantage. It alone reflects only conditionally systematic risks and actual costs of applied corporate policies (Sikora & Downar, 2014). While conventional accounting and financial metrics give an insight into a company's market value, forward-looking voluntary reporting is becoming more relevant to a business's overall value proposition and is regarded as a prerequisite for financial and overall firm competitiveness (Denčić-Mihajlov & Spasić, 2015).

Recent years have witnessed an increasing number of companies reporting on environmental, ethical and social aspects of their business activities through a particular form of disclosure. Sustainability reporting is a very important part of today`s external corporate reporting. Adequate inclusion of sustainability issues in company`s reports is one of the key issues for further development of corporate communications with stakeholders (Stojanović-Blab et al., 2016). Many companies have made a conscious effort to "go green" and pursue actions that are optimal for a broad class rather than simply one class of shareholders (Rezaee & Rezaee, 2014), and actions designed to lead to a "desirable future state" for all stakeholders (Funk, 2003).

Numerous international and European organizations and institutions consider issues relating to the content and type of reporting on economic, environmental and social aspects of the business and try to jointly create adequate guidance and guidelines in this area. From the accounting point of view significant are Directive 2003/51, Directive 2013/34/EU and especially Directive 2014/95/EU or the so-called CSR Directive. In addition to these directives, the engagement of the Federation of European Accountants, which worked on the establishment of a Generally accepted framework for environmental reporting, is also meaningful in this area (Denčić-Mihajlov & Stojanović-Blab, forthcoming). At the global level, the most adopted multi-stakeholder standards which address a wide range of sustainability issues are the Global Reporting Initiative (GRI) and the UN Global Compact (UNGC). As pointed out by Rasche (2010), the 'market' for sustainability reporting is nowadays highly fragmented with numerous standards, certifications, principles etc. which, on one hand, increases the opportunities for reporting, but, on the other hand, creates difficulties for corporations and stakeholders in operating and evaluating firm performances.

The Global Reporting Initiative has, over the past decades, made substantial progress in assembling a list of sustainability indicators relevant to a wide spectrum of stakeholders and applicable to corporations across all sectors (on the different versions of the GRI sustainability reporting guidelines see: Blab et al. 2014). In May 2013, the Global Reporting Initiative set up the fourth generation of its sustainability reporting guidelines, the GRI G4 Sustainability Guidelines (consisting of two parts - Reporting Principles and Standard Disclosures and Implementation Manual), which remain valid till 1 July 2018. In comparison to previous G3 and G3.1, G4 Guidelines do not bring changes regarding reporting principles, but offer

novelty on how to determine material aspects (encourage organizations to provide only information critical to their business and stakeholders) and the effects they may have. The G4 Guidelines offer the so-called *core option* and *comprehensive option* as two independent options of how organization's sustainability report can comply with the Guidelines. The *core option* requires the provision of minimal foundation information and reporting of at least one indicator for all identified material aspects. *Comprehensive option* builds on the *core option*, by demanding supplementary disclosures about the organization's strategy, governance, ethics and integrity. If deciding on the *comprehensive option*, an organization must report all indicators for all identified material aspects (GRI, 2015).

The new GRI Standards issued in October 2016 by the Global Sustainability Standards Board are created as the first universal set of regulations for sustainability reporting, which offer companies a universal tool for disclosing non-financial information. Sustainability reporting based on the GRI Reporting Framework consists of Reporting Principles, Reporting Guidance, and Standard Disclosures (including company Strategy and Profile, Management approach and Sustainability performance indicators). With the GRI Standards, "GRI aims to maintain the proven principles of sustainability reporting, but to provide users with more flexibility, clearer instructions, clear terminology and a modular structure of the GRI standards, to remedy content redundancies and to provide a more logical structure of the GRI standards compared to GRI G4" (on the comparison between GRI G4 and GRI Standards see: Stojanovic-Blab & Blab, 2017). Unlike GRI, which is viewed mainly as a reporting standard, the UNGC is termed as a principle-based standard (Rasche, 2010). The UNGC framework has a simple and relatively logical structure with criteria related to the four core sustainability issues (Human Rights, Labor, Environment and Anti-Corruption) and 10 UNGC principles for responsible and sustainable business behavior that corporations are required to report. Other relevant and globally-recognized frameworks for sustainability reporting are given by *Sustainability Accounting Standards Board* (SASB), *International Labor Organization* (ILO), *OECD Guidelines for Multinational Enterprises*, CDP, *World Resources Institute* (WRI) and *World Business Council for Sustainable Development* (WBCSD) among others (about the complementarity of these frameworks see: GRI/The complementarity of frameworks (2016)).

As pointed out by Lydenberg et al. (2010), in order to maximize the usefulness of sustainability reporting, it is essential that reporting regime integrates a means of identifying key sustainability performance indicators at a sector level. These indicators focus on the sustainability data material to most stakeholders and enable corporate stakeholders to give support for the improvements in the most important aspects of a company's sustainability performance; they should align all levels of an organization with clearly defined targets and benchmarks to create accountability and to track progress (Hrebiček et al. (2011). In this way, the selected sustainability performance indicators would focus on the 'key' measures as the most important to understanding the business and thus avoid the trend toward extended reporting on a wide range of less relevant measures.

The aim of the paper is to investigate the development and application of the performance indicators of sustainable management with the aim to offer suggestions for selection of sustainability ratios the application of which should increase the effectiveness of controlling and decision-making process and would lead to long term competitive advantage. The structure of the paper is as follows. In Section 2 we give an overview of sustainability indicators types, goals and selection process. Following GRI reporting framework, triple-bottom principle is adopted to present economic, environmental and social performance sustainability indicators in Section 3, 4 and 5 respectively. The final Section provides conclusions and proposes the objectives for future research.

1. SUSTAINABILITY INDICATORS: NATURE, PURPOSE AND SELECTION

The advantages of an integrated approach to social, environmental and economic business goals have been shown in a variety of publications (for a literature review see Giovannoni & Fabietti, 2014). Sustainability reporting should not be an objective by itself. Sustainability reporting should be regarded as a key action in implementing corporate strategy which is aiming at recognizing the impact on company's stakeholders, influencing stock specific opportunities and mitigating risks and negative impacts on the economy, society and the environment. Consequently, of central importance is to specify most suitable performance indicators to support operational decision-making in enterprises. According to EY& GRI (2014), one of the key drivers behind the increase in sustainability reporting has been the acknowledgment that, to be meaningful, a sustainability strategy must be based on reliable, concrete data, which can only be the case once the mechanisms and systems for reporting the facts are put in place. As shown in Table 1, this selection process starts with taking into account globally recognized sustainability reporting initiatives and guidelines. Having recognized and encompassed specific sector issues, the process of sustainability indicators selection ends up with the consideration of company relevant characteristics and market position (such as age, size, geographic exposure, complexity, history, news flow). Such a process enables organizations to recognize and track the results and, more importantly, to establish a system that properly indicates firms' values and requirements (Searcy et al., 2005).

Table 1 The process of selecting sustainability indicators

Global initiatives and guidelines
UN Global Impact
OECD Guidlines for MNC
Global Reporting Initiative
Other frameworks (SASB, ILO, WRI and WBCSD)
↓
Sector Issues
Internally defined sector key issues
MSCI ESG Resereach
GRI Sectors Disclosures
↓
Company Specific Indiators
Geografic scope; Multinationalty
Age and Size
Ownership Concentration & Structure
Business Complexity
↓
Sustainability indicators

Source: Adapted from Columbia Threadneedle Investments (2016)

The indicators are measurements that show the status of an environmental, economic, or social system over time (Redefining Progress, Sustainable Seattle, and Tyler Norris Associates, 1997). These are simple units of measure that are critical when making decisions in a complex environment. Sustainability indicators can be classified along various dimensions of measurement, such as sustainability attributes (for example

economic, social or environmental attributes) or frameworks (for example DPSIR-indicators) (Singh et al., 2012). Waas et al (2014) classify sustainability indicators into several categories following their important aspects in practice:

- Descriptive (give a description of an actual situation) vs. normative (compare an actual situation with a desired one);
- Quantitative vs. qualitative;
- Objective (that are sensed by instruments outside the individual) vs. subjective (only verifiable through "subjective" explanations);
- Community vs. expert (classification depending on who develops the sustainability indicators—stakeholders "bottom up" and/or experts "top down");
- Ex-ante vs. ex-post.

Fiksel et al. (1999) indicate that sustainability indicators can address inputs and processes (leading indicators) and outcomes (lagging indicators). Since leading indicators tend to be internally-focused, it is not surprising that the majority of externally-reported indicators are in the lagging category. According to objectives and purposes, sustainability indicators can be represented in various forms, such as qualitative or quantitative, general or specific, and absolute or relative indicators (Bae & Smardon, 2011). Key sustainability indicators are usually quantitative measures (given for example in terms of mass, volume or number of environmental pollutants or physical materials), defined with a purpose to manage sustainability control and to plan qualitative fields of action in the area of sustainability management. However, some indicators cannot be defined in physical terms and have to be expressed qualitatively. Indicators which are based only on subjective estimates (qualitative indicators), usually include social dimensions of a firm's activities and play a decisive role for nonmonetary goals, such as reputation, transparency, compliance and credibility.

General indicators are used by companies across all sectors (therefore are easily comparable) and deal with globally discussed issues (for example, climate agreements such as Montreal Protocol or Kyoto Protocol). On the other hand, specific indicators are specified for an industry or firm. For instance, in a Report Toward a Sustainable Cement Industry, Battelle Memorial Institute (2002) proposes key performance indicators for companies in this industry (such as non-product output, i.e., *Waste per ton of cement*, or *Net CO_2 (kg) per ton of cement*).

Absolute indicators are used to measure a firm's quantitative environmental and social impact related to its activities, products, and services (Bae & Smardon, 2011). In this regard, companies report, for example, on *Total amount of energy/water consumed per year* or *Total amount of hazardous waste generated*. Relative indicators (such as ratio of waste per unit of input material as an example of eco-efficiency indicator) are given in terms of a ratio or proportion that compares two absolute indicators, which assures a process of trend evaluation, comparison and consideration of possibly better sustainable opportunities and practices.

With regard to sustainability indicators selection process, as Staniškis & Arbačiauskas (2009) point out, "a particularly important aspect is related to the application of a product life cycle approach. Frequently, enterprises limit performance analyses to production and to other internal processes, sales and general economic indicators. Yet, there are cases when a product use impact on the environment is stronger than that caused by the production phase".

Having identified the indicators and metrics (as a specific means of measuring and tracking a performance indicator), the company should set short and long term targets, as a determined level of performances it is aiming at. Indicators designate a measurable dimension of performance, metrics provide a means of quantifying the indicators, and targets provide a basis for tracking and assessing improvement, they guide decision-making efforts and support stakeholder communication (Fiksel et al., 1999). The main purpose of sustainability indicators' calculation and application is, thus, to monitor and evaluate effectiveness and performance of goals and targets in a decision-making strategy for sustainable development (Parris & Kates, 2003). Key sustainability indicators can be used for strategy implementation and control, in the realization phase, especially when transferring decisions to be given to implementing sustainability instances. In this way, they fulfill the information task for the stakeholders. Some sustainability indicators are suitable for comparison purposes, while some can also be a subject of benchmarking (Hentze, 2014). In this way, key indicators in the sustainability planning process can serve as a stimulus for the identification and analysis of problems, or for comparison actions and performance of firms that may or may not be implementing sustainable business (Kuhndt et al., 2002).

The majority of published theoretical and empirical studies on sustainable indicators and performance measurement address the issue of balance in the number of indicators and stress the need to develop a small set of indicators. According to the European Federation of Financial Analysts Societies, one of the "essential criteria" for a useable key performance indicator (KPI) set is that it "should be manageable in dimension, e.g. a small set of 30 KPIs max." (EFFAS, 2009). O'Connor & Spangenberg (2008) address the issue of a proper number of sustainability indicators, as the question of a 'balance' in the number of indicators associated with each performance issue, with each stakeholder type, for each site. According to the GRI Guidelines (2011), each Level application requires minimal number of reported sustainability indicators (at the C level, the company must only report on 10 GRI indicators, at the B Level on 20, and at the A Level all 50 GRI "core" indicators must be represented, either with data or a valid explanation as to why the indicator is not reported).

Even though the main impetus for sustainability performance reporting comes externally, from shareholders and other stakeholders, nowadays companies use sustainability performance evaluation for both external and internal reasons. If properly selected, sustainability performance indicators can support the identification of the possibilities for activities' optimization, point out to the inefficiencies that could be resolved by preventive actions, develop the process of exchanging information (Staniškis & Arbačiauskas, 2009), create more incentives for management to refocus its goals, strategic decisions, and actions from a short-term to a long-term prospect (Rezaee & Rezaee, 2014), help to identify risks, as well as the potential for improving efficiency and finding new markets and can have a significant impact on the overall performance, as well as investors' perceptions and access to capital (EY & GRI, 2014).

Companies use data and facts from the sustainability reports with the aim to conduct actions of sustainability management as well as for the engagements in the field of global corporate strategy, products and supply chains management, employees, society and social commitment (Hentze, 2014). Key figures and facts are presented according to the thematic areas in sustainability reports, such as economic, environmental, social, eco-efficiency, social-economic or social-environmental. They are the object of sustainability controlling, which is a part of sustainability management. In this way, a special "service function" of sustainability reporting fulfills its purpose. In order to develop an operational

system to bring value to the enterprise, according to Toth & Arbačiauskas (2005), sustainability performance indicators should be (a) meaningful, (b) comparable, (c) integral, (d) clear, (e) continuous, and (f) efficient.

With the process of technology and digitalization development and sophistication of the systems for data gathering, the processes of controlling and improving sustainability performances will become more closely related to each other, and the sustainability and market performance indicators performance will be more strategically linked. Following the GRI reporting framework, the triple-bottom principle is adopted to present economic, environmental and social performance sustainability indicators in the following text.

2. Economic Performance Indicators

Financial performance indicators measure companies' profitability and current financial status and give information necessary to meet primary objectives of companies, such as maximizing shareholder wealth and growth/survival as well the information on the shareholder return and profits and the relationship between profits and shareholder value. As Lin et al. (2014) point out, "economic performance in sustainability reports is frequently confused with the financial performance in accounting reports". The economic indicators go one step further than the standard financial disclosure in explaining the process of value creation, and in reporting its distribution and reinvestment for future growth. "They measure a company's influences on its stakeholders' economic circumstances and on the economic systems at local, national, and/or international levels" (GRI, 2006). In this way, both human and financial capital is taken into account.

This economic aspect of performance gained in popularity during the 1990s and the observed changes in demand for sustainability reports by the users. "It was intended to measure flows of capital among different stakeholders and the economic impacts of the organization on the society" (GRI, 2006). GRI Guidelines (G3) specifies three economic performance aspects: (1) *Economic performance*; (2) *Market presence*; and (3) *Indirect economic impacts*. Each of these categories contains a set of sub-indicators. The 200 series of the GRI Standards (2016) include topic-specific standards used to report information on an organization's material impacts related to economic issues such as: *GRI 201: Economic Performance , GRI 202: Market Presence, GRI 203: Indirect Economic Impacts , GRI 204: Procurement Practices, GRI 205: Anti-corruption and GRI 206: Anti-competitive Behavior*. *GRI Standards 201: Economic Performance* (2016), for example, encompasses topic specific disclosures such as:

- Disclosure 201-1: Direct economic value generated and distributed, that includes indicators related to (I) direct economic value generated (revenues), (II) economic value distributed (a) operating costs, such as royalties, payments for contract workers, training costs or costs for personal protective clothing, (b) employee wages and benefits, payments to providers of capital, payments to government by country, and community investments and (III) economic value retained;
- Disclosure 201-2: Financial implications and other risks and opportunities due to climate change, i.e. risks and opportunities resulting from climate change that could significantly impact operations, revenue, or expenditures;
- Disclosure 201-3: Defined benefit plan obligations and other retirement plans;
- Disclosure 201-4: Financial assistance received from the government.

According to Bae & Smardon (2011), five most used economic performance indicators among companies quoted on the New York Stock Exchange in the period 1999-2006 are *Annual profits, Annual revenues, Annual Sales, Fines* and *Donations*. These are general and absolute indicators, relatively easy for calculation and comparison.

As reported by Lin et al (2014), among three economic performance aspects proposed by the GRI Guidelines (G3), the most disclosed by companies listed in the GRI database is economic performance, while the lowest rated aspect is indirect economic impact. They also reveal that "economic performance indicators are considered less important compared relatively to the social and environmental indicators, and explain that by the fact that economic aspect was the most recent addition to sustainability reporting and therefore it is less familiar to both the preparers and users".

Table 2 The most used sustainability indicators

Economic performance indicators	▪ Annual profits ▪ Annual revenues ▪ Annual sales ▪ Annual operating costs (based on EHS) ▪ Costs saving (based on EHS) ▪ Capital expenditure (environmental) ▪ Annual productivity ▪ Fines ▪ R & D investment (Based on EHS) ▪ R & D investment (total) ▪ Donations ▪ Annual turnover ▪ Value added
Environmental performance indicators	▪ Total amount of water used ▪ Total amount of energy used ▪ Total amount of greenhouse gases generated (CO2) ▪ Total amount of solid waste generated ▪ Total amount of hazardous waste generated ▪ Total amount of waste recycled or reused ▪ Total amount of Volatile Organic Compound (VOC) generated ▪ Total amount of air emissions generated (SOx, NOx) ▪ Total number and volume of significant spills and accidents ▪ Total number of environmental violations
Social performance indicators	▪ Female, disabled person's ▪ The recruitment of people from ethnic minorities, older workers, women ▪ Empowerment of employees ▪ Average hours of training/ employee ▪ Number of employees ▪ Recordable illness rate ▪ Lost time rate ▪ Whether or not firms implement a broad range of voluntary activities ▪ Whether or not firms provide opportunities to communicate internally and externally to interested parties ▪ Breakdown of employees in terms of gender, age, and minority group

Source: Adapted from Bae and Smardon (2011)

3. Environmental Performance Indicators

The attention to environmental protection rose after a chain of ecological and environmental disasters during the 1970s and 1980s. The problem of environmental protection has grown to such a degree that the issue of resolving this problem has become the subject of significant international conventions and conferences, such as, the *First United Nations Conference on the Human Environment* in 1972 (adopted document: Stockholm Declaration), the *UN Conference on* Environment *and Development* in 1992 (Rio Declaration and Agenda 21), the *UN Conference on Sustainable Development* in 2012 (final document "The future we want"), etc. (for a chronological review of most important conventions and conferences see: Stojanović, 2015).

Environmental reporting became a part of many sustainability reports, while environmental disclosures became mandated in many countries, including both developed and developing. Environmental performance measurement evaluates interrelatedness between the business and the environment and could be analyzed at the level of individual environmental performance indicators, the level of the overall performance measurement system and at the level of the relationship of this system with the external environment (Olsthoorn et al., 2001). These indicators are "numerical measures, financial or nonfinancial, that provide key information about environmental impact, regulatory compliance, stakeholder relations and organizational systems" (Veleva & Ellenbecker, 2001).

In the context of the GRI Standards (GRI, 2016), the environmental aspect of sustainability is related to the effects that an organization has on living and non-living natural systems (on land, air, water and ecosystems). The disclosure standard *GRI 301: Material 2016*, can provide information about an organization's impacts related to materials (renewable or non-renewable), and how it manages these impacts (indicated by its approach to recycling, reusing and reclaiming materials, products, and packaging). *GRI 302: Energy 2016* sets out reporting requirements on the topic of energy (energy consumption within and outside the organization, energy intensity, reduction of energy consumption and reduction in energy requirements of products and services). Energy intensity ratios, for example, can be specified on the product, services or sales level (such as *Energy consumed per unit produced, per service, or per monetary unit of sales*). *GRI 303: Water 2016* designs reporting requirements on the topic of water (like water withdrawal by source, water recycled and reuse, etc.). In this regard, the indicator of water reuse and recycling (*Total volume of water recycled and reused as a percentage of the total water withdrawal*) is a measure of efficiency and demonstrates the success of an organization in reducing total water withdrawals and discharges.

GRI 304 addresses the topic of biodiversity, with the indicators related to significant impacts of activities, products and services on biodiversity or habitats protected or restored. *GRI 305* focuses on direct and indirect emissions into air (greenhouse gas (GHG), ozone-depleting substances, etc). GHG emissions intensity expresses the amount of GHG emissions per unit of activity, output, or any other organization-specific metric. *GRI 306* addresses the topic of effluents and waste, and includes indicators related to water discharges, generation, treatment and disposal of waste and spills of chemicals, oils, fuels and other substances. *GRI 307* deals with the topic of environmental compliance, covering an organization's compliance with environmental laws and/or regulations. This includes compliance with international declarations, conventions and treaties, as well as national, sub-national, regional and local regulations. *GRI 308* addresses the topic of supplier environmental assessment.

In a recent study, Bae & Smardon (2011) point out that five most used absolute environmental performance indicators among NYSE listed companies (Table 2) are *Total amount of water used*, *Total amount of energy used*, *Total amount of greenhouse gases generated*, *Total amount of solid waste generated*, as well as *Total amount of hazardous waste generated*. The empirical study realized by Henri & Journeault (2008) suggests that Canadian manufacturing firms devote moderate importance to the various environmental indicators. These authors indicate that the most used indicators are those that measure conformity with inputs of energy, community relations, outputs of solid waste and outputs of air emissions, while the indicators that are considered least important are those providing information on the local, regional or national condition of the environment, measuring the inputs of auxiliary materials or the implementation of environmental policies and programs. A new study done by Székely and vom Brocke (2017) on 9,500 corporate sustainability reports published between 1999 and 2015, shows that the most reported indicators on environmental sustainability are related to energy and emissions, while biodiversity and renewable energy sources receive little attention in reports by organizations.

The process of selection of environmental indicators should take into account the trade-off between environmental and corporate performance criteria. As Delmas and Blass (2010) point out, "it is advisable to favor environmental indicators that might have a more direct and immediate impact on firms' operations and performance over those that might be less directly related to a firm's operations, but could potentially have a bigger environmental impact".

4. SOCIAL PERFORMANCE INDICATORS

The social dimension of sustainability deals with the company's influence on the social systems within which it operates. Progress in social sustainability at the firm level requests a simultaneous improvement of social (institutional interaction between individuals on all levels of a company) and human (knowledge and experience of individuals) capital (Spangenberg & Bonniot, 1998).

Social reporting, with its assessment of the social impact of corporate operations, is regarded as the first supplement to traditional financial reporting. According to Ranganathan (1998), social performance indicators measure the relationship of business with its stakeholders. Most companies have a long history of applied measures and accountability mechanisms for shareholders and customers as key stakeholders. A new challenge in this reporting field is to define performance indicators related to impact on other stakeholders, such as communities, employees, suppliers, by including topics of business ethics. With this purpose, Ranganathan selects (a) employment, (b) community relations, (c) ethical sourcing and (d) social impact of products as crucial components of social performance.

Elkington et al. (1998) suggest that there are social issues and indicators with broad utility across stakeholders, companies and sectors. They classify social indicators into different categories concerning four related issues: 1) *Employment practices* (indicators such as: gender and ethnic ratios, pay rates, benefits, holidays, training, job satisfaction, a safe working environment, etc.), 2) *Community relations* (with indicators like contributions to community development, job creation, taxes paid/ tax breaks received), 3) *Supplier and customer relations* (fair trading practices with suppliers, distributors and partners, number of products sourced locally, use of child or forced labor), and 4) *Social impact of product* (indicators such as contribution of products and services to social welfare and equity, the meeting of basic human needs, etc.).

Warhust (2002) concludes that the current state of development of corporate social performance and sustainability indicators is running at least a decade behind that of the development of environmental performance and sustainability indicators. Many of the organizations working on social performance issues are only just beginning to turn their attention to the development of measures relating to social performance, and those that are doing so are typically working in isolation.

GRI Standards (2016) lists 19 indicators for social performance: *Employment, Labor/Management Relations, Occupational health and safety, Training and education, Diversity and equal opportunity, Non-discrimination, Freedom of Association and Collective Bargaining, Child labor, Forced or Compulsory Labor, Security practice, Wrights of indigenous people, Human rights assessment, Local communities, Supplier social assessment, Public policy, Customer health and safety, Marketing and labeling, Customer privacy and Socioeconomic compliance*. The indicators in this field of reporting describe the influence organizations have on the society as well as the management of potential risks occurring from interactions with other social institutions (particularly the risks linked with bribery and corruption, undue influence in public policy-making and monopoly practices). For instance, *Total number and rate of new employee hires during the reporting period, by age group, gender and region*, *Total number and rate of employee turnover during the reporting period, by age group, gender and region*, or *Total number of employees that took parental leave* are the indicators belonging to indicators' sub-group *Employment*, while *Average hours of training per year per employee* or *Percentage of employees receiving regular performance and career development reviews* are social indicators assigned to category *Training and education*.

CONCLUSION – LESSONS LEARNED FROM SUSTAINABILITY INDICATORS APPLICATION IN PRACTICE

The aim of reporting via key economic, social and ecological performance indicators is improvement of the quality of the sustainability reports and their relevance for stakeholders (for example, in the field of risks and opportunities), controllability and comparability (at acceptable costs) across different periods and companies. In order to fill out these functions, the indicators should be objective, understandable, significant, consistent with the objectives, responsive to stakeholder expectations. The application of the sustainability indicators in the praxis has indicated that they should be "workable", i.e. the data required to implement them should be indeed available in practice. Identifying appropriate set of sustainability indicators is a complex and time and resource consuming task. However, even incomplete and imperfect sustainability performance measurement is better than measurement disconnected from business objectives. On the other hand, previous research has suggested that many firms engage in sustainability and environmental reporting for symbolic reasons rather than out of a genuine concern for accountability to a wider set of stakeholders (Adams, 2004); thus, an increase in reporting is not always a reflection of increased sustainability (Price, 2008). Firms can choose to report whatever information they want, so there is obviously an incentive to focus on positive outcomes. These findings suggest that more objective measures of sustainability performance would be useful.

As indicated in Sustainability and Reporting Trends in 2025 (GRI, 2015a), new indicators, enabled by technology development and digitalization, will in coming years enable companies to operate and report in a highly-integrated way. In this regard, new indicators to measure trust as well as the correlated indicators (showing the connection between different factors in the context in which the decision will be made) and the integrated indicators (to guide the decision by integrating a company's performance measurement and reporting with that of its supply chain, regional partners or sectorial peers) will need to be created and monitored constantly.

Another important challenge when developing and applying sustainability indicators, as illustrated by Latawiec & Agol (2015), refers to the conceptual problems with interpretations of sustainability and its subjectivity. Subjectivity is closely linked to issues with values, in the context of sustainability, with the conflicts between human wellbeing, environmental conservation and economic development. Therefore, it is necessary to recognize all the multiplicity and ambiguity related with indicators, and understand and accommodate multiple views on sustainability.

The praxis of sustainability management shows that maintaining the interrelatedness of sustainability with various corporate aspects such as company strategy, decision on company growth, risk management, reputation or executive remuneration, is frequently a difficult task. If a company strategy is related, for instance, to an expanding of worldwide operations, it would be expected to link sustainability indicators and considerations to its strategic management of social, political and economic factors. As Funk (2003) points out, some famous episodes in the public eye, Shell's conflict with the Ogoni people of Nigeria and allegations about Nike's labor practices for example, demonstrate that sustainable operations are an opportunity to avoid or reduce future costs. Early measurement and reporting of leading indicators of sustainability initiatives also helps build better relationships with stakeholders, especially at the local level. In the field of risk management, Funk indicates that proactive investing in environmental measures beyond that required by law can be good for the bottom line, if for no other reason than to limit the downside risk of damages, hefty litigation fees and public relations disasters. If pursuing sustainable business strategies can increase a company's expected value, it is sensible to infer that integrating sustainability considerations into other kinds of risk management will lead to better decision making. However, a study done by Eumedion (2012), which analyzes the use of key performance indicators in the sustainability reporting by the largest Dutch publicly listed firms, indicates that in relation to risk management, only 52% of the companies provide a link between sustainability and the company's risk management in the annual report (while only 33% of the companies apply sustainability indicators in executive remuneration).

Managers "myopia" and their orientation towards the pressure for immediate results for this quarter, is often in contradiction with a long-term strategic consideration of sustainability. However, sustainability reporting practice has shown that the disclosure of both financial and intangible performance information, and more importantly the ability to act and react on the basis of its perception, can supply decision makers with a more comprehensive insight into key issues for successful long-term performances. It should be emphasized that the impact of indicators on overall sustainability could be evaluated and changes in indicators could be linked to competitiveness performance measures such as stock price, earnings per share or market share. As the social, ecological and environmental problems become more tangible, financial and investment success increasingly depends on the efficiency with which companies solve them. Traditionally, environmental compliance and social welfare

expenditures were regarded as extra costs that bring no added value. However, recent studies suggest that sustainability reporting has a positive impact on competitive advantage and improves financial performances (see for example Adams et al. 2011, Hussain, 2015), which implies that firms should devote more attention to improving both their sustainability and transparency.

Apart from the relevance of sustainability performance indicators to financial performance, the increase in sustainability reporting practice and the publication of the reports have been accompanied by growing interest in the accuracy and completeness of these reports (see Haller et al. 2016, 2016a). Here, one should pay attention to two facts. First, while the percentage of companies issuing a formal sustainability report has been increasing in the last few years, the percentage of companies assuring their sustainability report is stagnate (Mori et al., 2014). Second, the lack of uniformity of sustainability accounting reporting and assurance might reduce the comparability, effectiveness and accuracy of sustainability accounting reporting. A growing interest in sustainability reporting assurance is to be both expected and welcomed in the coming years and will be an important avenue for future research.

Acknowledgement: *This research was realized within the Center for Scientific, Interdisciplinary Risk Management and Sustainability (ZWIRN), University of Applied Science, Wolfenbüttel, Germany.*

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OCENA POKAZATELJA ODRŽIVOG RAZVOJA: PRISTUPI, IZAZOVI I MOGUĆNOSTI

Dinamično i kompleksno poslovno okruženje zahteva od preduzeća da pažljivo razvijaju svoje poslovne strategije kako bi ostvarila i održala konkurentsku prednost u dugoročnom periodu. Razvijanje svesti o značaju očuvanja životne sredine i održivog razvoja ima za posledicu da tržišnu vrednost preduzeća više ne određuju pojedinačni pokazatelji finansijskog učinka. Okvir održivog razvoja, koji obuhvata ekonomske, ekološke i društvene performanse, je duži period predmet međunarodne pažnje, kako realnog, tako i finansijskog sektora. Iako je opšte prihvaćeno da je usvajanje indikatora održivog razvoja najadekvatniji i najefikasniji način procene performansi održivog razvoja, kreiranje/selekcija ovih pokazatelja i njihova primena i analiza su i dalje predmet

detaljnih analiza, kako na nacionalnom, tako i na korporativnom nivou. Većina kompanija usvojila je međunarodno priznatu metodlogiju i metriku evaluacije performansi (na primer Global Reporting Initiative ili Global Compact of United Nations). Međutim, sve je veći broj kompanija koje primjenjuju samostalno razvijenu metodologiju ocenjivanja performansi održivog razvoja. Osnovni cilj rada je istraživanje procesa kreiranja, selekcije i primene indikatora održivog razvoja s ciljem da se daju predlozi za odabir pokazatelja održivosti čija bi primena bila u funkciji povećanja efikasnosti kontrolinga i procesa donošenja odluka i rezultirala dugoročnoj konkurentskoj prednosti.

Ključne reči: *izvešavanje o održivom razvoju, ekonomski, ekološki i društevni indikatori performansi, GRI standardi, kontroling.*

FACTA UNIVERSITATIS
Series: **Economics and Organization** Vol. 14, N° 4, 2017, pp. 307 - 319
https://doi.org/10.22190/FUEO1704307N

Review Paper

SUITABILITY OF ACTIVITY – BASED COSTING FOR *LEAN* BUSINESS CONCEPT

UDC 657.474

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Abstract. *Lean business concept is characterized by securing the required customer value, quick product delivery, elimination of all forms of waste both from production and from all business processes in the company. In order to successfully respond to such requests, company managers need an appropriate information base. One of the possible information bases is activity-based costing. The paper deals with the issue of application and suitability of activity-based costing for lean business concept*.

Key words. *lean concept, activity-based costing, elimination of waste, performance measurement*

JEL Classification: M 41

INTRODUCTION

Application of *lean* business concept began in the last decades of the 20th century. However, the earliest examples and postulates of *lean* business concept date back to 1855. Specifically, a weapons warehouse recorded a single piece flow. Since then, *lean* business concept has evolved and today represents the leading business paradigm of modern companies. *Lean* business concept includes a business philosophy and culture that eliminates all forms of waste from the company business flows in order to shorten the lead time. This can be achieved by performing value-added activities in the best possible way and constant business process improvement and employee development. The application of the basic principles of *lean* business concept brings numerous benefits both at operational and strategic levels. At the beginning of the application of *lean* business concept, only operational improvement is visible. This is because strategic improvement comes only

Received June 29, 2017 / Accepted September 26, 2017
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after changing the way of thinking, business culture, and working methods, of both managers and executives. By guiding managers and executives towards reducing waste in business processes, operational improvement becomes strategic.

In an effort to adapt to *lean* business concept and successfully respond to demands of various stakeholders, company managers change their production systems, costing methods, and management methods. One of the concepts that can be successfully applied in the process of continuous improvement is activity-based costing.

Based on the information arising from activity-based costing, managers can monitor product and service costs, assess their profitability, and find out where they can reduce costs. Activity-based costing finds its conceptual basis in activities carried out in a company, and for the allocation of the increased mass of overhead costs, they use adequate bases, both those related to the physical volume of production, and those that do not relate to the physical volume of production, which leads to more precise costing. A particularly important aspect of this costing system is the ability to identify and eliminate non-value-added activities, which increase costs and time necessary for the product to be produced or service delivered.

In this regard, the paper is divided into three parts. The first part of the paper points to the essence of *lean* business concept and the model that should be established in the company in order to achieve a competitive advantage. The second part of the paper presents the basic characteristics of the original activity-based costing concept. Finally, similarities and differences between activity-based costing and *lean* business concept are highlighted.

1. THE ESSENCE OF BUSINESS CONCEPT

The term *lean* business concept is used in the business world to designate a philosophy that incorporates different models, methods, techniques, and tools applied in business processes in order to optimize time, employees, resources and productivity to ensure and improve quality of products and services delivered to customers (*Lean Manufacturing and the Toyota Production System*, 2010).

In the initial stages of development, *lean* business concept focused only on the operational level. At the operational level, it sought to reach customer value by applying appropriate *lean* techniques and practices. In this respect, the tendency was to improve efficiency and reduce costs in the production process (Salehi & Yaghtin, 2015), in order to create the value customers expected from a product. Thus value became the heart of *lean* business concept. Eliminating waste and unnecessary resource spending during the execution of business processes was seen as the basic goal of the *lean* concept. Waste and unnecessary spending in the *lean* business concept imply all non-value-added activities, resources, processes, and employees. With their elimination, waste and unnecessary spending of company resources disappear. Companies see waste as an enemy, which at the same time restricts operations and impedes the realization of the defined company strategy and goals. However, elimination of waste and unnecessary spending does not necessarily mean elimination of resources, processes, and dismissal of company employees, but the possibility of directing them to some other value-added activities within the company. In any case, elimination of waste and reduction of operating costs are important preconditions for creating *lean* flows and processes. Eliminating non-value-added activities leads to achieving the defined performance targets, ensures better understanding of processes, and facilitates the improvement of business processes and performance.

The focus of *lean* business concept during the 1990s shifted from operational to strategic level. At the strategic level, the aim was to understand the value provided to customers, in terms of product quality, costs, functionality, delivery speed, and the like.

National Institute of Standards and Technology Manufacturing Extension Partnership Lean Network gave the definition of *lean* business concept, seeing it as "a systematic approach to identifying and eliminating waste through continuous improvement, flowing the product at the *pull* of the customer in pursuit of perfection (*Lean Principles)"*. This definition of *lean* business concept is integrated into company strategies and development policies, as customers determine the level of production and product quality. This business concept is the business philosophy rooted in the minds of employees.

Womack and Jones (Womack & Jones, 2003) gave another definition of *lean* business concept. They explain *lean* business concept as the most powerful weapon that creates value while eliminating waste in a company. *Lean* business concept requires value determination, definition of activities needed to create value, and their effective and continuous performance. *Lean* business concept allows one to do more with less and less. Less resources refers to less human effort, less equipment, less time, and less space.

Lean business concept is also defined as the creation of a business system that focuses on streamlining and improving processes in order to shorten the time needed for their performance and resource retention time within the process.

Consequently, *lean* business concept focuses on the following objectives: business process improvement in the company, performing only value-added activities, and eliminating all forms of waste and unnecessary spending (Chen & Taylor, 2009).

The above definitions of *lean* business concept put emphasis on business philosophy, process, people and partners, and problem solving, giving rise to the so-called "4P model". The 4P model of *lean* business concept is shown in Figure 1.

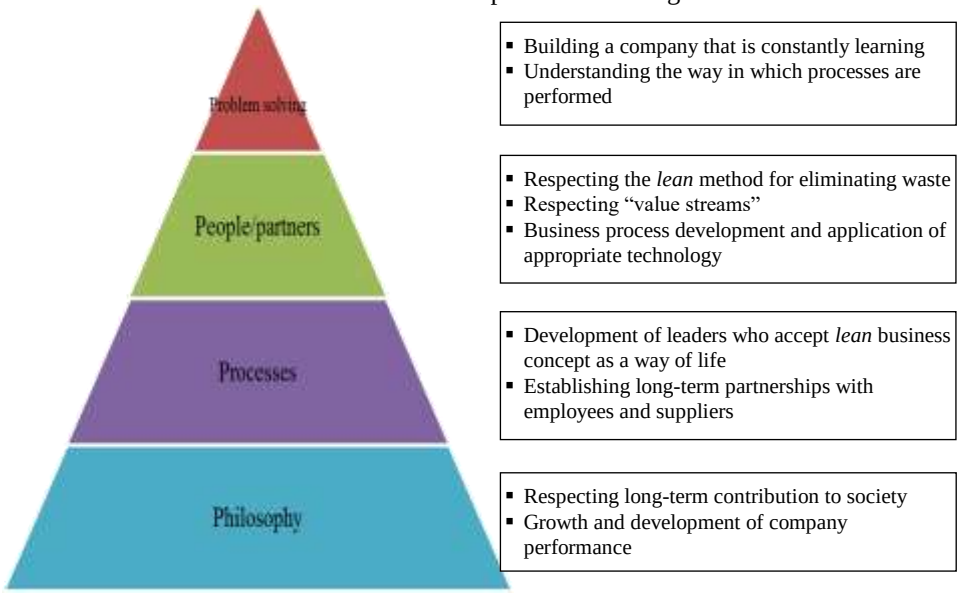

Fig. 1 4P model of *lean* business concept

Source: Liker, J., Meier, D. (2006). The Toyota Way Fieldbook, a Practical Guide for Implementing Toyota's 4 Ps. New York: McGraw-Hill. p. 26.

The 4P model basis is a business philosophy. Modern companies focus on transforming values in the company in order to meet the needs of customers and owners, as well as other numerous stakeholders. Each of the listed groups of stakeholders is interested in a certain aspect of company operations. Customer satisfaction is only an initial stage, from which company results and contribution go further. In order to achieve this, *lean* business concept must be seen as a kind of company strategy, which basically relies on reduced operating losses, i.e. lowering costs, better use of resources, and delivering higher value to customers as well as other stakeholders.

The second P in this model refers to business processes carried out in the company. Toyota, which is considered the cradle of *lean* business concept, realized that well-designed processes lead to right results (Liker & Meier, 2006). Business process design involves a long-term activity that brings lower costs and product quality improvement. This, first of all, refers to the establishment of well-organized "value streams" in which *lean* methods and techniques are used to eliminate all forms of resource waste.

An important part of *lean* business concept is its human aspect, so it is understandable that the next element of the 4P model relates to people, i.e. employees. *Lean* concept respects all employees in the company, from operational workers in the production process to company managers. All employees are part of a team that continually strives to improve business activities. The company success is the success of all employees, not the individuals who lead the company. The behavior and operation of employees depend primarily on the incorporated business philosophy and culture, which employees rely on to achieve continuous improvement of activities they perform. In this sense, *lean* business concept allows for increasing employee satisfaction by providing very quick feedback with the aim of transforming resource waste and scrap into value-added activities.

The last element of the 4P model is problem solving. Continuous problem solving at the place where problems occur stimulates learning and growth in the company, and, thus, leads to better performance. Spotting the problem where it occurs is possible if one knows the business processes that are performed in the company well and if they are managed by a manager who "lives" *lean* business concept.

The application of the 4P model requires a long-term company orientation to better results, through employee training and education to carry out business processes through continuous problem solving, in a way that will increase the value for all stakeholders. If one of the above model elements is left out, implementation of other elements will not be complete, nor will the desired results be achieved.

Benefits from the application of *lean* business concept are noticeable at: operational, administrative, and strategic levels. The first visible business improvement occurs at the operational level. Research has shown that companies that applied *lean* business concept reduced lead time by 90%, increased productivity by 50%, reduced work-in-progress inventory by 80%, improved product quality by 70%, and reduced use of business potential by 75% (Womack & Jones, 1994).

Administrative improvement allows (*Lean Principles)*:

- Reduction of errors in the product ordering process,
- Shortening customer waiting time, improving customer service function,
- Reducing documentation and paperwork of business processes by ensuring that more time is spent on securing value for customers,
- That the same number of workers handle a greater number of orders,

- Lowering costs with the increase in inventory turnover, and
- Implementation of business standards.

Strategic business improvement can be seen after a long period of time. This improvement relates to increased market share and rise in cash flow and corporate income. A large number of companies engage professional consultants for *lean* concept implementation and spend large sums of money. However, *lean* business concept must first be accepted by the top management to achieve the defined goals. This is because the process of implementing *lean* business concept must begin with the research and analysis of existing business practices, in order to determine the *lean* technique that is appropriate to specific business practices. If that is not the case, *lean* concept will be just a simple tool for business improvement.

2. ACTIVITY-BASED COSTING AND MANAGEMENT

Activity-based costing (ABC) emerged as a result of the efforts of accounting theory and practice to respond to the information requirements of company management in changed business conditions. The initial goal of activity-based costing was to overcome the weaknesses of traditional costing systems, in terms of finding adequate keys to allocate overhead costs. This is because the new ways of doing business and the changed organizational structure in the company have led to a rise in overhead costs, but also to a reduction in direct labor costs, which were the most commonly used basis for allocating overhead costs. In a situation where the mass of overhead costs is allocated on the basis of direct labor costs, cost of goods determined by traditional approach becomes an unreliable information basis for making business decisions, planning, and control. The basic novelty of activity-based costing is that this concept recognizes that most of the company's resources are not used in direct production, but in production support activities and sale of products and services (Malinić & Jovanović, 2011). In fact, activity-based costing implies that costs are incurred when carrying out activities of production and sales of products. The basic task of this method is to allocate overhead costs to products by carefully researching the relationship between products, activities that incur production costs, and resources spent on production. Activity-based costing is based on the following assumptions (Antić & Georgijevski, 2010):

- To produce a product or service, it is necessary to carry out appropriate activities,
- To carry out an activity, it is necessary to spend some resources,
- Activities are the basis of cost allocation, and
- Cost drivers (resource cost drivers and activity drivers) do not have to be related to the physical volume of production.

In Figure 2, a two-dimensional activity-based costing model is shown.

The figure shows the vertical and horizontal dimension of activity-based costing and their interconnectedness with activity-based management (ABM).

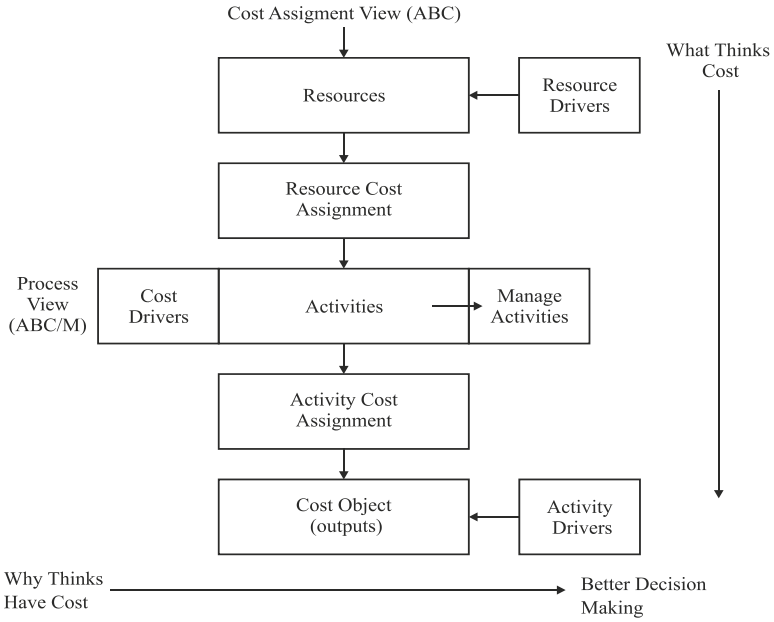

Fig. 2 A two-dimensional activity-based costing model
Source: Cokins, G. (2001) Activity-Based Cost Management – An Executives Guide, John Wiley& Sons, New York. p.15.

Vertical dimension refers to costing by cost objects. Direct resource costs can, like in traditional costing, be transferred directly to cost objects (Antić, 2003). However, indirect resource costs are transferred to cost objects by means of two-step allocation. Resource costs are allocated to activities based on the resource cost driver, i.e. on the basis of the amount of resources needed to perform certain activities. Then activity costs are allocated to cost objects with the help of activity drivers. Activity drivers measure the number of individual activities done in production. At both levels of cost allocation, keys are used that are independent of the physical volume of production (Antić & Sekulić, 2008). The process of activity-based costing is done in four iterations (Weygandt at al, 2008):

- Identification and classification of activities involved in the production process and allocation of production overhead costs to appropriate activities,
- Identifying cost drivers associated with activity costs,
- Calculating the production overhead cost rate for each cost driver; and
- Allocating production overhead costs from activity costs to products, using overhead cost rate for each driver.

The process of designing an activity-based costing system begins with identifying and classifying activities performed in a company from the perspective of available resources. In this regard, the conceptual basis of this costing system lies in activities carried out in the company. Activities can be defined as “every repeated action, movement or order of operations, carried out in order to execute the business function, and it can be described with a verb or noun, for example starting the machines or unloading of raw materials

(Rainborn et al, 1996). Identifying and classifying activities involves a detailed analysis of the work and processes that are performed in a company. Specifically, the goal is to determine the level of activity for the execution of defined tasks. The selection of activities will depend on the company size, its organizational structure, types of activities, and the like. An analysis of activities carried out in the company and the identification of resources for their performance create a good basis for allocating overhead costs to activities. This helps to determine the amount of resources spent on performing each activity. There are different ways to classify activities (Oliver, 2000):

- Repetitive activities (those undertaken permanently by the company) and non-repetitive (one-off or temporary activities),
- Primary activities (activities directly related to the mission of organizational parts that contribute to the performance of business functions) and secondary activities (activities that support the performance of primary activities and cause spending of time and resources),
- Value-added activities (activities that customers are willing to pay for because they increase the product value) and non-value-added activities (activities that do not increase the product value and consume time and resources, so customers are not ready to pay for them). These activities can be reduced or eliminated without affecting the quality and quantity of products.
- Controlled activities (company policies and procedures for doing business) and activities that are out of company control (state regulations and weather conditions)
- Optional activities (activities that depend on the business policy of the company as well as on managers' attitudes, but are not necessary for operations) and mandatory activities (activities that must be carried out in the company, because without them the company could not function).

Information about activities carried out in a company can be obtained in several ways. In this process, company employees play an important role as direct executors of jobs and tasks. Based on experience, employees can predict how much resources are spent on each activity. This will identify the causes of resource consumption that are the basis for allocating overhead costs to activities.

After allocating overhead costs to activities, cost drivers for each activity are determined, which should reflect the actual consumption of activities for each cost object. Activity drivers are usually the number of transactions or the elapsed time (Colin, 2003). The number of transactions can be, for example, the number of processed customers, the number of inspections carried out, and the like, while time, as cost driver, refers to the time period required to perform the activity.

When selecting activity drivers, it is necessary to take into account the following three factors: level of interconnectedness, costs of measurement, and effects on behavior of employees (Hilton, 2009). Since the goal of allocation is to determine how much each product consumes activity, the accuracy of cost allocation depends on the level of interconnection between activity consumption and consumption of activity driver. If, for example, the inspection activity takes the number of inspections and the time of inspection as drivers, the adequacy of drivers depends on the consumption ratio of drivers within the inspection activity. Thus, if every inspection activity requires the same time, the number of inspections can be used as a driver. However, if there are significant variations in the time of activity, it is easier to establish a link between the inspection activity and the duration of the inspection as the driver

of this activity. Stronger connection between activity consumption and its driver consumption gives a more precise allocation of costs from activities to products. The application of activity-based costing allows for the choice of a large number of cost drivers. However, although the choice of a large number of cost drivers leads to greater accuracy of cost allocation, the end result may be higher costs of adopting and maintaining the system. When choosing a cost driver, one should bear in mind the effect of the choice of activities on the behavior of employees. If the procurement activity takes the number of times suppliers were contacted as a cost driver, procurement manager may decide to contact a smaller number of suppliers, which may result in failure to identify the vendor with the lowest cost or the highest quality. It is very important to emphasize that the level of activity drivers should not be reduced in order to reduce costs if it endangers the product quality and its functionality.

In the third iteration, the rate of overhead costs is calculated for each activity driver. The overhead cost rate for each driver is obtained by dividing overhead costs with an appropriately determined driver for each activity.

In the last iteration of activity-based costing, allocation of overhead costs to products is made using the previously calculated overhead cost rate per activity driver. The costs for each product are obtained by multiplying the overhead cost rate with the expected consumption of driver for each activity.

The main argument for the application of activity-based costing is its precision in calculating product costs. By collecting the finest details on individual activities, this costing concept provides a good basis for making strategically important business decisions. Because of its information suitability, there was an attempt to further improve this concept. The horizontal dimension was added to the vertical dimension of activity-based costing.

Horizontal dimension of activity-based costing illustrates the process as a series of interrelated activities to achieve the goals set (Antić & Sekulić, 2008). This model made it possible to link the process of cost allocation to processes carried out in a company, by establishing a link between activity-based costing and activity-based management. Based on cost information and non-financial information on activities derived from the horizontal dimension of the ABC model, answers to the following questions can be given: which events trigger the performance of activities, which activities require the most resources, how successfully are activities performed, which factors have a negative impact on the performance of activities, and the like (Turney, 1997).

Bearing in mind the plenty financial and non-financial information underlying this concept, in the early 1990s it turned into activity-based management concept. Activity-based management is reflected in the provision of information on the basis of which managers can provide answers to the following questions (Kaplan & Cooper, 1998):

- How can the company achieve better position on the market, and
- How can internal capacities be improved and costs per unit reduced?

Activity-based management is commonly referred to as the process that involves identifying value-added and non-value-added activities for customers, company reengineering, value-added benchmarking, and development of a performance measurement system that will contribute to continuous development.

Identifying value-added and non-value-added activities is important from the aspect of their improvement and elimination. Non-value-added activities are those that cause costs, but do not increase value for customers. In this sense, there is the possibility to eliminate them without affecting the quality of products and services delivered. The next five steps

allow the elimination of non-value-added activities: identifying all activities, identifying non-value-added activities, detecting activity interaction, constructing performance measurement system, and reporting on costs of non-value-added activities (Hilton, 2009).

Value-added activities are those activities that customers are willing to pay for. These activities are necessary for the functioning of the company and there is no possibility of their elimination. Value-added activities can be improved in terms of increasing the efficiency of their performance. Thus, reengineering, as a process of redesigning the ways in which activities are carried out, is one of the ways to increase the efficiency of performing the appropriate activities. Benchmarking can also be used to improve value-added activities. In that sense, activities performed in the company are compared with activities of another company with the best practice.

Adopting a performance measurement system makes it easy for companies to continuously monitor activities and costs and find ways to reduce costs, eliminate waste, and improve quality.

3. ACTIVITY-BASED COSTING AND *LEAN* BUSINESS CONCEPT

Activity-based costing means long-term orientation and focus on calculating product costs. As such, it is a sophisticated method of cost allocation with the help of a cost driver. In this way, managers receive information on where costs occur, and, on the basis of this, link costs with their drivers. By establishing this relationship and improving the process of cost allocation, activity-based costing becomes an effective tool for reducing activity costs. Based on information this costing concept provides, it is possible to improve the process of making business decisions. In this regard, activity-based costing can help determine where the value is generated in the company, as well as make an analysis of this value. Application of activity-based costing allows identifying non-profitable products and non-value-added activities that need to be eliminated, which creates conditions that limited company resources are used only to produce profitable products. The application of this concept has greatly facilitated and improved company operations, significantly contributing to cost reduction and increasing the competitive advantage of the company. Activity-based costing has been a milestone in the development of costing system, and, as such, is suitable for use in a large number of companies. The concept of activity-based costing has changed and improved in order to eliminate the observed limitations in its application. As such, this costing concept can be applied in companies that apply *lean* business concept. Although there are many similarities of this costing concept and *lean* business concept, it is logical that certain matching will occur but also the difference between these concepts. Table 1 gives an overview of similarities and differences of activity-based costing and *lean* business concept.

The main purpose of doing business in companies that apply *lean* business concept is to reduce waste in order to increase business efficiency, with precise costing. Activity-based costing fits into this requirement of *lean* business concept in terms of precise costing and long-term orientation. However, activity-based costing does not provide precise information on the actual amount of costs needed to achieve the defined goals. Activity-based costing allows one to understand how costs occur in a company, as well as

which products are profitable, and which mix of products favorable for the company. Finding information about product profitability involves the collection of additional information about the business processes that are performed in the company. Gathering this data implies additional efforts and costs. Certainly, the collection of additional information for business decision-making, which results in the adoption of a decision by which the defined goals are achieved, should not constitute a redundant activity, but it is at high risk. Managers of companies that apply *lean* business concept require information support that will immediately produce the desired information, and not bring additional activities and waste.

Table 1 Similarities and differences of activity-based costing and *lean* business concept

	lean business concept	Activity-based costing
Time of creation	Toyota 1950-1960	1910, but came to life in 1980
Basic purpose	Reduction of waste and increasing efficiency	As accurate calculation of product costs as possible
Extended purpose	Philosophy of continuous improvement	Enable activity-based management
Optimization	Promotes optimization	Not explicitly emphasized
Time dimension	Long-term cost-improvement process	Long-term focus on variable costs
Basic focus	Company as a whole, cooperation and synergy	Calculating costs to provide real cost information
Orientation to improvement	Kaizen to achieve perfection	Does not result directly from ABC, but is possible in ABM
Production control	*Pull* system with *Kanban*	Does not relate to control
Overhead costs	Linking all costs within production cells	Overhead costs are linked with activities and then with products
Costs of production	Accurate and precise calculation of costs	Precise cost calculation
Inventory level	Zero inventory	Not applicable to inventory level
Waste	Focus on elimination	Not seen before the onset of ABM
Quality	Ensure quality of products at the source	Does not apply to quality
Performance measurement	Financial and non-financial measurement	All costs are related to profitability

Source: Martin, J. Comparing Traditional Costing, ABC, JIT, and TOC, available at:http://maaw.info/TradABCJITTOC.htm

The extended purpose of *lean* business concept in terms of fostering a culture of continuous improvement is not emphasized in activity-based costing, but using activity-based management can accomplish this purpose in a good way. This is because activity-based management encourages the analysis of activities and aims to eliminate non-value-added activities. Accordingly, the lack of implementation of activity-based management would refer to the absence of a tendency to optimize activity performance.

Lean business concept insists on optimizing the performance of business processes with long-term improvement, while activity-based costing does not emphasize explicit optimization, but is focused in the long term on improvement and monitoring variable costs. Business

improvement by applying *lean* business concept is achieved by Kaizen and by the application of numerous *lean* techniques. Improving business processes does not result directly from applying activity-based costing, but can be achieved by applying activity-based management.

An important aspect of *lean* business concept is the zero level of inventories and the production of quality products. Activity-based costing does not directly address the level of inventory, but through monitoring of the business process and the activities carried out, it aims at ensuring the required product quality. A special place in ensuring product quality and eliminating plenty of waste belongs to activity-based management.

Activity-based costing takes into account the flow of processes established in the company as one of the principles of *lean* business concept. However, this costing system links costs with activities and individual products, not with "value stream" and production cells.

Activity-based costing does not indicate a direct link between calculating precise operating costs and improving operational performance, which is one of the premises of *lean* business concept. Thus, the original activity-based costing model does not take into account the existence of unused capacities which *lean* business concept specifically deals with. An attempt was made to eliminate this deficiency by using time-driven activity-based costing, but the deficiency has not been completely eliminated. First of all, this refers to a long and complex process of collecting and processing data needed to calculate costs, as well as the inability to easily update and adapt to changed circumstances. Also, there is employees' subjectivity when assessing the time needed to perform the activity (Antić & Novićević Čečević, 2016).

It should be noted that activity-based costing is complex for everyday use, which is in contrast to simplicity and comprehensibility on which *lean* business concept insists.

Based on the foregoing, one can conclude that activity-based costing, together with activity-based management and time-driven activity-based costing, partly fits in the company management requirements when applying *lean* business concept. Because of its great information power and suitability, this costing concept can be applied at the initial stages of company development. In practice, there are cases of activity-based costing application in the initial stages of development, and the companies that applied it facilitated their transformation into *lean* companies. In the later stages of transformation into a *lean* company, all of the stated disadvantages of this costing concept come to the fore, so it is necessary to replace this concept with a new one, which will best show the benefits of applying *lean* business concept.

CONCLUSION

After Toyota had achieved enviable performance with *lean* business concept, a number of Western companies started implementing it. The goal of *lean* business concept is to reduce all forms of waste that can occur not only in the production but also in all business processes, in order to deliver the product of the required characteristics to the customer just in time. Any waste created additionally increases product cost, so the focus should be on its reduction or elimination.

In order to survive in the race to achieve a competitive advantage, many companies have begun with *lean* transformation of the entire business. Applying *lean* business concept is possible in both business and production processes as well as in accounting and finance. This is because the omission of the accounting process from the necessary changes would lead to inability to present the improvement achieved. In this sense, at the beginning of the application of *lean* business concept, the possible information basis is activity-based costing.

Activity-based costing allows measuring costs and performance of activities, resources, and cost objects. This costing system, linking resources with activities and activities with cost objects, recognizes the relationship between cost drivers and activities. As such, activity-based costing enables identification and elimination of non-value-added activities, which increase costs and time necessary for the product to be produced or service delivered. Since activity-based costing was a good potential information base for *lean* business concept, it was necessary to examine its suitability for implementation in such business conditions.

Activity-based costing appeared in 1910, but its application and full acceptance came much later, while *lean* business concept came to the fore only after the Second World War. Given that they appeared in different parts of the world and that the economies of these countries had different problems and characteristics, it is clear why certain differences between these concepts occur.

In this regard, activity-based costing can be applied in companies that apply *lean* business concept because:

- ABC enables managers to understand the activities performed in the company, establish their hierarchy, and find adequate drivers, which *lean* business concept requires too to provide a good basis for finding business constraints and potential opportunities for business improvement;
- Careful review of business processes and activities carried out allows finding the places where costs occur and their precise calculation;
- Although ABC, in contrast to *lean* business concept, emphasizes the process flow, not the value stream, the establishment of flows of both material and information in the company is an important aspect of business continuity;
- The desire to eliminate non-value-added activities is one of the requirements of activity-based costing, as well as of *lean* business concept. Non-value-added activities are considered waste that slows down the company flows, thereby increasing the value of performing certain activities.

Acknowledgement: *The paper is realized in the scope of the project No. 179066 "Improving the Competitiveness of the Public and Private Sector by Networking Competences in the Process of European Integration of Serbia", funded by the Ministry of Education and Science of the Republic of Serbia.*

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PODOBNOST OBRAČUNA TROŠKOVA PO AKTIVNOSTIMA ZA *LEAN* KONCEPT POSLOVANJA

Lean koncept poslovanja karakteriše se obezbeđivanjem zahtevane vrednosti od strane potrošača, brzom isporukom proizvoda, eliminisanjem svih oblika gubitaka kako iz proizvodnog tako i iz svih poslovnih procesa u preduzeću. Da bi uspešno odgovorili na ovakve zahteve menadžerima preduzeća potrebna je odgovarajuća informaciona osnova. Jedna od mogućih informacionih osnova jeste obračun troškova po aktivnostima. U radu se obrađuje problematika primene i podobnosti obračuna troškova po aktivnostima za lean koncept poslovanja.

Ključne reči: *lean koncept, obračun troškova po aktivnostima, eliminisanje gubitaka, merenje performansi*

FACTA UNIVERSITATIS
Series: **Economics and Organization** Vol. 14, N° 4, 2017, pp. 321 - 332
https://doi.org/10.22190/FUEO1704321F

Preliminary Communication

ECONOMETRIC ANALYSIS FOR TOURISM DEMAND FUNCTION IN EGYPT: A DYNAMIC PANEL DATA APPROACH

UDC 338.482:303.4(620)

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Abstract. *In this paper, the author investigates the tourism demand function using the dynamic panel data approach in the case of Egypt. The panel data set covers the time period between 1995 and 2014. The individuals are 49 countries as origin countries for tourists, representing 92% of the total tourist arrivals to Egypt. Explanatory variables which affect the tourism demand function were taken into account: lag of dependent variable that leads to dynamic panel data approach, using DIFF-GMM estimator proposed by Arellano and Bond (1991); also, many other explanatory variables like GDP per capita, relative price index, distance, and dummy variable which represent the political situation. One of the important and significant conclusions of the paper is the significant effect of the lagged dependent variable (0.493), which may be explained as "Word of Mouth" to tourists' decision when choosing the destination.*

Key words: *dynamic panel data, tourism demand, DIFF-GMM, Egypt*

JEL Classification: C15, C 51, C33, Z32

INTRODUCTION

The tourism in Egypt has a significant role in Egyptian economy, and the tourism development has a vital contribution in economic and social development. As the fastest-growing and the largest industry in the world, according to World tourism organization, and the industry with the largest number of employees, it contributes to the increasing standard of living. Thus, the state is interested in tourism development and ready to support it with large investments due to its impact on the GDP increase, taxes, capital investment and value added. Furthermore, tourism is the most important source of welfare in many regions and countries.

Received October 11, 2016 / Revised August 15, 2017 / Accepted August 31, 2017
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According to the World tourism organization in 2004, the number of tourist arrivals to Egypt was around 8.1 million, bringing around US$ 6.3 billion of Gross Domestic Product. By 2010, both the number of arrivals and GDP nearly doubled, the number of arrivals increased to 14.73 million, and tourism contribution to GDP grew to US$ 13.63 billion. In addition, the contribution of the travel and tourism industry in total employment was about 1,744 million jobs. However, the political situation in Egypt in 2013 clearly affected the number of tourist arrivals in Egypt, leading to the decrease in the number of arrivals to 9.46 million, accounting for US$ 6.75 billion within GDP. This paper analyzes the relationship between the demand tourism in Egypt and other economic variables which affect the demand tourism function, such as Gross Domestic Production, the relative price between the host country and the origin countries, the distance between Egypt and these countries. The paper will also cover non-traditional factors including geographical location, whether the countries have a common border, the number of World Heritage sites, the time zone difference, and the political situation in Egypt as dummy variables. Many scientific papers investigated this relationship in many countries such as Turkey, Portugal, Austria, Germany and Malaysia. However, this paper will be the first to investigate this relationship using the dynamic panel data model depending on GMM-DIFF approach in the case of Egypt. The main contributions of this paper can be found in estimating the variables which are included in the tourism demand model in Egypt using the suggested GMM –DIFF methodology.

Specifically, in the case of Egypt tourism should be studied as the pivotal part of economy, since as a destination it is the place of the oldest civilization, with pleasant weather throughout the year. Tourists come to Egypt all year round: in the summer, the main destinations are cities like Alexandria, Hurghada, Sharm El Sheikh, and Marsa Matrouh, while in the winter, tourists can come to cities like Luxor and Aswan. Throughout the year, historical places like the Egyptian museum, the pyramids and the sphinx in Cairo and Giza are available for visits. Egypt supports many types of tourism such as medical tourism, educational tourism (conferences), and religious tourism. Also, there are many Christian monasteries and Islamic places and the safari in the beautiful area of St. Catherine, Mount Moses in Sinai, Al-Dakhlah and AI-kharg, where tourists can watch different animals and migrating birds.

The purpose of this study is to empirically cover the weaknesses observed in the research of the demand function of tourism in Egypt, especially by using dynamic panel data. More specifically, this paper is the first one to use the approach of studying the demand function of tourism using dynamic panel data models based on GMM –DIFF in Egypt. Additionally, the dynamic estimation approach is used to investigate the long-term tendencies of tourism movements in Egypt.

This paper investigates the effects of various factors on the dynamics of tourism demand in Egypt. Because of that, we use econometric methodology by applying Generalized Method of Moment estimator (GMM-DIFF) on the dynamic panel data model. Especially, there are few studies using dynamic panel data analysis in tourism in Egypt. The importance of this study lies in the utilization of the panel data model from 1995 to 2014, which allows the estimation of the effect of different variables on the tourism demand in Egypt, with more information from cross section data and time series analysis. Although these approaches were applied in many different studies, the estimated elasticities change from one country to another and from period to period, depending on the explanatory variables. The paper is organized as follows: After the introduction, a literature review of empirical studies in the field of tourism is given in Section 2. Section 3 is dedicated to the

econometric estimation methods of dynamic panel data models, while Section 4 contains the main estimation results. Further discussion and conclusion are presented in Section 5.

1. LITERATURE REVIEW

During the last two decades, there was a growing empirical literature on tourism modeling focused on the determinants of the tourism demand and especially on prediction of the tourist demand. Variables included in the tourism demand models differ from paper to paper. The dependent variable, the demand of tourism, is represented as the number of tourist arrivals, number of overnights, or the revenue of tourism from tourists (Song and Li, 2008). When it comes to independent variables, many of them were used in different analyses on the tourism demand model. Most common variables are the lagged variable of dependent variable, average income per person in other countries, the cost of traveling, the government expenditure in tourism and marketing, and price of tourism (Song and Li, 2008). In (Sara A. Proença and Elias Soukiazis; 2005), the authors divided the independent variables in two groups: the first group incorporates demand factors such as real personal income and the relative price of tourism, while the second group represents supply factors such as the number of beds in hotels available for tourists, the infrastructure in the hosting country.

Various econometric techniques are used to estimate the tourism demand function. According to applied methods, the mentioned literature could be divided into three groups. The papers in the first group used the technique of cross section data and classical multiple regression (for example, Witt and Witt, 1995; Lim, 1997 and 1999; Crouch, 1994 and 1995). The second group of empirical studies used modern time series data technique and cointegration (for example, Kulendran and Witt, 2001; Song et al. 2003; Narayan, 2004; Drivisekera, 2007; Ouerfelli, 2008). Finally, the third group of studies makes a combination between cross section data and time series data in tourism demand using panel data regressions and different estimation methods (Generalized least squares method (GLS) like Naude and Saayman (2005), Generalized method of moment (GMM), etc.).

The problem of biased estimates when the lagged dependent variable is one of the explanatory variables is considered by Sequeira and Nunes (2008). They investigate the effect of country risk on tourism demand using generalized Method of Moment (system-GMM) with dynamic panel approach, finding the significant statistical effect for variables of the natural logarithm of tourism specialization, as well as prices. In addition, Teresa and Martin (2007) investigate the determinants of tourist arrivals to the Balearic Islands for the period 1991–2003 from the 14 major origin countries using the panel data approach. The result of their model showed that the lagged dependent variable of the number of tourists is significant as well as the relative price, at 0.05 significance level; however, the variable gross domestic product was not significant.

A different study, conducted by Munoz (2007), estimates the impact of Germany tourism demand in Spain for the period 1991-2003, using the dynamic panel data. This study aimed to prove that lagged tourism arrivals present a positive effect in the long run. The result showed that the Portuguese economy charges higher prices and these are associated with high quality products. The coefficient of government spending (GOVSP) is statistically significant at 1% level. Government expenditures are important for attracting the tourists to a destination. The significance effect for lagged dependent variable at 0.05 significance level was also found.

Building on the same idea, Skrinjaric (2011) analyzes the tourism demand in Croatia for the period from 1994 to 2009 for 19 partners. He utilizes a GMM-system, explaining that the variation in tourism demand depends on the ICP and income per capita. In 2014, Serra et al, studied a similar problem in Portugal in the period between 2000 and 2011, covering seven regions in Portugal. While recognizing the positive sign for the variables demonstrated in the research, the authors found the significance effect for the variable real per capita income of the sending country, as well as public investment ratio in the host country at 0.05 significance level. Recently, Zhang (2015) investigated the explanatory variables for the period 2009- 2013 for the sample covering 40 countries using dynamic panel (GMM-system). The model shows that the jet fuel price has no significant impact on the number of inbound travelers, but the variable of the gross domestic product (GDP) is significant at 0.1 significance level.

Following the majority of the literature, we can also use the dynamic panel data specification and methods like Arellano-Bond first-step GMM estimator to investigate the determinants of tourist arrivals.

2. Econometric Methodology Framework

The difference and system generalized method-of-moments estimators, developed by Holtz-Eakin, Newey, and Rosen (1988); Arellano and Bond (1991); Arellano and Bover (1995); and Blundell and Bond (1998) are increasingly popular. Those estimation methods can be used when independent variables are not strictly exogenous. Namely, when they are correlated with past and possibly current realizations of the error term. System of equations in both first-differences and levels, where the instruments used in the levels equations are lagged first-differences of the series. These instruments are valid under restrictions on the initial conditions, to obtain a linear GMM estimator better suited to estimating autoregressive models with persistent panel data.

There are many advantages of using GMM-DIFF such as efficiency, weighted by the inverse of the variance of the population moments, which, under suitable conditions, is the asymptotic variance of the sample moments. The second advantage is feasibility, meaning that making GMM practical requires a feasible estimator for the optimal weighting matrix. There is also a disadvantage of difference and system GMM is that they are complicated and so can easily generate invalid estimates.

In this study, a dynamic panel data (GMM-DIFF) will be used. This estimator helps the researchers to solve the problems of serial correlation, heteroskedasticity and endogeneity for some explanatory variables. The GMM-System estimator is an alternative to the standard first differenced GMM estimator, suitable for estimating the dynamic model. Arellano Bond estimation starts with the difference GMM by transforming all regressors, usually by differencing. After that, it uses the Generalized Method of Moments, thus called “difference GMM". Forward orthogonal deviations transform, proposed by Arellano and Bover (1995) is sometimes performed instead of differencing. The Arellano-Bover/Blundell-Bond estimator augments Arellano-Bond by making an additional assumption. The GMM-DIFF estimator is consistent if there is no second-order serial correlation in the residuals. However, that first differences of instrumental variables are uncorrelated with the fixed effects; the dynamic panel data model is valid if the estimator is consistent and the instruments are valid.

There are also assumptions about the data generating process for the difference and system GMM estimators when we design panel analysis: the process and data may be in dynamic type, with current realizations of the dependent variable influenced by past ones (lagged dependent variable); some regressors may be endogenous, and/or predetermined (not strictly exogenous).

The construction of the panel data model with lagged dependent variables as one of explanatory variables, the unobserved panel-level effects are correlated with the lagged dependent variables, thus making standard estimators inconsistent. Arellano and Bond (1991) derived and introduced consistent generalized method of moments (GMM) estimator for this model. Moreover, this estimator is designed for datasets with many (N) and few (T). This method assumes that there is no autocorrelation, and requires the initial condition that the panel-level effects is uncorrelated with the first difference of the first observation of the dependent variable.

Special interest in statistical inference is post estimation procedure for the method (GMM-system). Firstly, the Arellano–Bond test for serial correlation in the first-differenced residuals should be applied (command in STATA *estatbond*). The estimation by GMM-DIFF is valid only if there is no serial correlation in the idiosyncratic errors. If the Arellano-Bond test rejects the null hypothesis of no serial correlation in the first-differenced errors at order one, it does not imply that the model is miss specified. However, rejecting the null hypothesis at higher orders implies that the moment conditions are not valid. Secondly, the Sargan tests the overidentifying restrictions (command in STATA *estat sargan*). The moment conditions used by GMM-DIFF can produce consistent estimates only if the moment conditions used are valid. Although there is no method to test if the moment conditions from an exactly identified model are valid, one can test whether the overidentifying moment conditions are valid.

3. Empirical Analysis of Tourist Demand in Egypt

3.1. Econometric model and data

The methodology of this paper will be dynamic panel data estimation methods, as often used in the previous empirical literature. This approach will be used to evaluate the demand function of tourism in Egypt during the 20-year-period from 1995 to 2014 in relation with eighteen countries, which represent around 92% of the annual number of tourist arrivals in Egypt: the Russian Federation, the United Kingdom, Germany, Italy, Saudi Arabia, Poland, the Sudan, the United States of America, Jordan, Libya, Canada, China, Denmark, Sweden, Austria, Belgium, France, and the Netherlands. These countries have been chosen as the biggest contributors to the number of tourists who come to Egypt yearly.

There are many advantages of panel data analysis over the cross-section data or time series data alone: it enables higher degree of freedom, and higher variability which consequently decrease the multicollinearity between variables (Hsiao, 2003). This makes the parameters more accurate and gives us the ability to control for omitted variable bias. Using dynamic panel data approach instead of static regression is convenient, as the later one has many problems such as instability (Witt and Song, 2000). In this paper, the dependent variable will be the number of tourists based on the data from the formal statistical source, United Nation World Tourism Organization (UNWTO). In this paper, variables will be as follows:

3.2. Variables:

Dependent variable: NT_{it}

Number of tourists (NT_{it}): this variable represents the number of tourists arriving to Egypt from origin countries such as: the Russian Federation, the United Kingdom, Germany, Italy, Saudi Arabia, Poland, the Sudan, the United States of America, Jordan, Libya, Canada, China, Denmark, Sweden, Austria, Belgium, France, and the Netherlands, during the period from 1995 to 2014, based on the data from the UNWTO.

Independent (explanatory) variables:

1. Lagged Number of tourists (NT_{it-1}): this variable represents the number of tourists arriving to Egypt from different countries (i) during the previous years (t-1). The expected sign for this variable is positive, due to the habit and preference of the tourists to go to the same place again.
2. GDP per capita ($GDPPC_{it}$) for sending countries: represents the gross domestic product per capita for each of the different countries (current US$), sourced from the World Bank site, the expected sign for this variable is positive.
3. Relative price index (p_{it}): represents the relative price index between the hosting country and the sending countries, in precise the Consumer Price Indexes in Egypt and the sending countries. This variable is given by the ratio of the price index level of the receiving country (Egypt) and the sending country, adjusted by the bilateral exchange rate. The source of that variable is calculated via formula based on the data from the World Bank. The expected sign for this variable is negative.

$$p_{it} = \frac{CPI_{Egypt}}{CPI_{Sending\ countries} ER_{it}}$$

4. Distance (D_{it}): the geographical distance between Egypt and sending countries represent a significant proxy for the cost, paid by tourists to arrive to Egypt. The distance will be measured by kilometers between cities, via website www.distancefromto.net.
5. Dummy variables: reflect the political situation in Egypt, presence of violence and terrorism. This variable is very important, as tourists tend to investigate the political situation before going to any hosting country. This variable takes value one when the situation in Egypt is unstable. The variable is based on the political analysis literature in Egypt, and it depends on the political situation between 2011 (January), when there was a revolution, and 2013 (June), when we got a new president. In this period, many of foreign embassies issued warnings for their host countries, advising against visiting Egypt in this period, such as Germany, France, Italy and Israel. Thus, the dummy variable was divided to three variables for the years 2011, 2012, and 2013:

When $year_{2011}$ is dummy variable which takes unity (1) for the year 2011, zero otherwise, $year_{2012}$ is dummy variable which takes unity (1) for the year 2012, zero otherwise. If Egypt has a bad political security in year 2012 and takes zero for other years, $year_{2013}$ is dummy variable which takes unity (1) for years 2013, zero otherwise.

Non-traditional factors:

These variables are non-traditional variables in previous models, incorporated in our model to explore their effect on the tourism demand function in Egypt. There are some that have natural candidate which may have a significant impact on the tourism demand function. Dummy variables will be used for each of these variables to check if there is significance relation on the tourism demand function or not. The source for these variables is available by world development indicators, for instance:

1. Geographical location (GL), means countries have the same border. This variable represents the countries which have a common border with Egypt, and the effect of the common border can be estimated in the model. GL is dummy variable which takes unity (1) if the sending country has the same border with Egypt, zero otherwise.
2. Number of World Heritage sites (NHS):
   The variable tests the estimation of the difference of the world cultural and natural Heritage sites in the sending countries and destination country, the tourists can prefer to visit the country with more cultural and natural Heritage sites, they may be interested in discovering different and heritages abroad, the data of this variable available on UNESCO site (Culiuc, 2014).
   NHS_{it}= (cultural and natural Heritage sites in sending countries) $_t$ – (cultural and natural Heritage sites in Egypt) $_t$
3. Time zone difference (TZD): the difference in time zone represents an important variable in tourism demand function, the tourism decreases in case of big difference between the sending and hosting countries. TZD_i is the time difference in hours between the sending countries and hosting country (Egypt).
4. Common language (CL): similarly, to the trade, the common language plays an important role in increasing number of tourists, especially in communication between the countries. CL is dummy variable which takes unity (1) if the sending country has the same language as Egypt, zero otherwise.

The econometric panel data model of tourism demand in our empirical analysis contains the following explanatory variables:

$$NT_{i,t} = f(NT_{i,t-1}, GDPPC_{i,t}, P_{i,t}, D_{i,t}, year_{2011}, year_{2012}, year_{2013}, DGL_{i,t}, CSI_{i,t}, NHS_{i,t}, TZD_{i,t}, CL_{i,t}) \quad (1)$$

The tourism demand estimated model is in the double-logarithmic form, as the most recommend form in previous empirical literature. Witt and Witt (1995) concluded that more than 75% of the empirical econometric models were designed in that functional form are easy for the interpretation of the coefficients through the demand elasticity. The parameter β1 indicates to what degree is the tourism demand in Egypt affected by the number of previous tourist arrivals. Thus, econometric model for estimation has the following form:

$$\ln NT_{i,t} = \beta_0 + \beta_1 NT_{i,t-1} + \beta_2 \ln GDPPC_{i,t} + \beta_3 \ln P_{i,t} + \beta_4 \ln D_{i,t} + \beta_5 year_{2011} + \beta_6 year_{2012} + \beta_7 year_{2013} + \beta_8 DGL_{i,t} + \beta_9 CSI_{i,t} + \beta_{10} NHS_{i,t} + \beta_{11} TZD_{i,t} + \beta_{12} CL_{i,t} + \gamma_t + \mu_i + \varepsilon_t \quad (2)$$

With i=1,2, …,20 and t= 1,2, ….,49.

when: $V_{it} = \gamma_t + \mu_i + \varepsilon_{it}$, V_{it} is the fixed effects, μ_i, γ_t are country effect and time effect respectively. ε_{it}, which is the error term, should be serially uncorrelated with zero mean,

and independently distributed across individuals. It also has to be uncorrelated with the dependent variable for all t.

Because of the dynamic processing in the model, it will face a problem of correlation between the first explanatory variable (lagged dependent variable) and the error term. So that, if we used the fixed effect (OLS) or random effects (GLS), our estimated coefficient would not be efficient, and it would be biased estimator. To override this, Generalized Method of Moment (GMM) estimation will be used to estimate dynamic panel data (Arellano and Bond, 1991), however assuming that there is no second-order autocorrelation in the errors. The main advantage of using GMM estimate lies in the control of the endogeneity through the lagged values of the levels of the endogenous, while the predetermined variables are instruments. The best solution for this problem is to use the first difference for the equation (2) to remove the individual effects followed by using the instrumental variables using instruments the values of the lagged two or more for dependent variable. This solution will offer consistent parameter but not efficient, provided by the first difference GMM method offered by Arrelano and Bond (Arrelano and Bond 1991, Hsiao 2003). This method assumed that there is not second autocorrelation in error term, and the equation will be offered as following:

The dynamic panel data model will be formulated as following:

$$\Delta \ln NT_{i,t} = \beta_1 \Delta \ln NT_{i,t-1} + \beta_2 \Delta \ln GDPPC_{i,t} + \beta_3 \Delta \ln P_{i,t} + \beta_4 \Delta \ln D_{i,t} + \beta_5 \Delta year_{2011} + \beta_6 \Delta year_{2012} + \beta_7 \Delta year_{2013} + \beta_8 \Delta DGL_{i,t} + \beta_9 \Delta CSI_{i,t} + \beta_{10} \Delta NHS_{i,t} + \beta_{11} \Delta TZD_{i,t} + \beta_{12} \Delta CL_{i,t} + \Delta \varepsilon_t \quad (3)$$

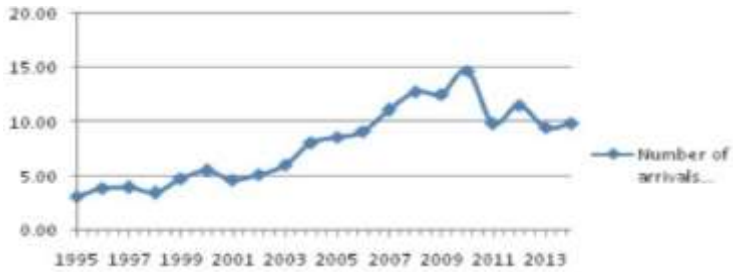
With i=1,2, …,20 and t= 1,2, ….,20.

$\Delta \ln NT_{i,t} = \ln NT_{i,t} - \ln NT_{i,t-1}$ And the same for all other variables, with method assuming that there is no second autocorrelation in error term, and Sargan model of over-identifying restrictions, as soon as we cannot reject the null hypotheses gives strength to the model.

4. Empirical Results

4.1. Descriptive analysis

The following section describes the characteristics of the number of tourists in Egypt during the period from 1995 to 2014. The number of tourists increased continuously until its peak in 2010, at approximately 14.7 million tourists. After that, due to increasingly unstable political situation in Egypt, a drop is visible in 2011 and 2013 to below 10 million arrivals.



Graph 1 Total number of tourists 1995 -2014
Source: United nation world tourism organization (UNWTO)

The following table represents the percentage of the total number of arrivals for each country, across the years 1995, 2000, 2005, and 2010.

Table 1 Origin of the tourists in Egypt 1995, 2000, 2005, 2010, and 2014 (In percentage of total number)

Year	1995	2000	2005	2010	2014
Russian Federation	3.51	3.30	9.03	**19.39**	**31.78**
United Kingdom	9.08	6.52	9.73	9.88	9.17
Germany	10.19	14.28	11.38	9.02	8.88
Italy	8.21	13.66	9.56	7.77	4.05
Saudi Arabia	5.73	4.36	4.20	2.55	3.54
Poland	0.54	1.04	1.79	4.03	3.07
Sudan	1.47	0.96	1.32	1.29	1.89
United States of America	4.94	4.27	2.27	2.45	1.57
Jordan	1.57	1.43	1.46	1.16	1.73
Libya	5.01	2.77	4.37	3.06	2.14
Canada	0.83	0.84	0.61	0.65	0.55
China	0.19	0.25	0.41	0.72	0.62
Denmark	0.63	0.93	1.07	0.92	0.54
Sweden	0.62	1.27	1.42	1.43	0.55
Austria	1.10	1.81	1.59	1.63	1.32
Belgium	1.43	1.94	1.79	1.33	0.75
France	3.90	6.90	5.75	4.07	1.47
Netherlands	1.25	2.58	2.39	1.98	1.28
Total percentage	60.19	69.11	70.16	73.33	74.89

Source: United nation world tourism organization (UNWTO)

The main aim of this work is to explore the international demand which represents 73% of all tourist arrivals, with a total of almost 15 million foreign tourists in 2010. The previous table represents the percentage of the number or the arrivals for each country, in five years. Germany leads with the highest percentage in 1995, 2000, and 2005, which are 10%, 14%, and 11% respectively. However, the Russian Federation represents the highest percentage in 2010, and 2014 with 14% and 32% respectively. The listed countries jointly represent 70% of the total number of tourists in Egypt in 2005, increasing to 75% in 2014.

4.2. Econometric methodology

The value of studying tourism demand models planning and policy has been discussed widely in many studies using the traditional regression model. However, those studies concentrated on static models which had many problems, including forecasting failures. In order to answer this problem, we will use Generalized Method of Moment estimation (GMM), developed by Arellano and Bond (2002) and used to estimate dynamic panel data (in STATA V.12). The lagged dependent was used as the explanatory variable, in order to capture the persistence effects of the tourist's habits and behavior. Two main reasons for using the lag variables number of tourist arrivals in Egypt are: firstly, uncertainty: there is strong certainty associated with visiting the country that you know and are familiar with it, contrary to visiting a country for the first time. Secondly, “the word of mouth” or spreading

other people's knowledge and experience about the beauty of a destination and comparativeness of the country, depending on many variables like the level of education, infrastructures, number of old heritage sites and many other variables. From that dynamic specification Eq (3), the result will be as follows:

Table 2 Estimation results for the linear and dynamic model (1995-2014)

Variables	GMM DIFF estimator of Arellano and Bond	
Constant	-15.847	(0.254)
ln_LagNT	**0.493**	**(0.000)**
ln_GDPPC	**0. 533**	**(0.000)**
ln_distance	1.996	(0.247)
ln_relativeprice	-0.009	(0.483)
year2011	**-0.458**	**(0.000)**
year2012	**-0.090**	**(0.017)**
year2013	**-0.411**	**(0.000)**
TZD	0.254	(0.419)
Number of observation	882	
Wald hi2(8)	3054.22	(0.000)
Sargan chi (189)	94.11	(0.875)

The bold numbers are significant at 0.05 significance level.

The equation will be as following:

$$\ln NT_{i,t} = -15.847 + 0.493 \ln NT_{i,t-1} + 0.533 \ln GDPPC_{i,t} - 0.009 \ln P_{i,t} + 1.996 \ln D_{i,t} - 0.458 year_{2011} - 0.090\, year_{2012} - 0.411\, year_{2013} + 0.254\, TZD_{i,t}$$

Number of observation =882, Wald chi (8) test= 615.73, Sargan = 94.11 (0.875).

Table 2 represents the estimated equation for the tourism demand function in Egypt using dynamic panel data when the i (individuals) is defined as the number of countries from 1 to 49, and the T defined as the number of years from 1995 to 2014. Based on the Arellano and Bond method we had the following estimated function:

From the previous equation, the value of Sargan test statistic has value 94.11 and p value 0.875, meaning that the test is not significant and the null hypothesis saying that the instruments used in this regression are correct can be accepted. Furthermore, the coefficient of lagged dependent variable (ln $NTi_{,\,t-1}$) is significantly estimated in the equation. That means, it is the behavior and habit (Word of mouth) for tourists to come to Egypt, and this result supports using demand is a dynamic process, confirming the previous studies which also found positive effect for this variable (Serra et al, 2014; Rodríguez et al, 2015).

The second explanatory variable is GDPPCA, also statistically significant with a positive sign, showing that there is a statistically significant relationship between the Gross domestic product per capita in sending countries and the number of tourists from these countries, the Relative price (pit), defined as the relative price index between the hosting country and the origin countries with respect to the Exchange rate, also dummy variables are statistically significant, they represent the political situation in Egypt in 2011, 2012 and 2013, there is negative significant relationship between the number of tourists and dummy variables which represent the years 2011, 2012 and 2013. In these years, there were two revolutions in Egypt in the period between 2011 and 2013. However, other variables are not statistically significant.

CONCLUSION AND DISCUSSION

The main aim of this paper is to identify and estimate the impact of the explanatory variables in the tourism demand function in Egypt from other countries such as Russia, Germany, Italy, the United Kingdom, France, Libya, Saudi Arabia, and Israel, and other countries which contribute mostly to the total number of tourist arrivals representing 92% of the total number every year, by using dynamic panel data during the period from 1995 to 2014, by using STATA v.12 depending on GMM-DIFF method which is presented by Arellano and Bond (1991) for analyzing dynamic panel data models.

By comment for the estimated elasticity in our model, we obtained the positive sign for the lagged variable of the number of tourists, and GDPPC in this country, and the values are lower than one and with the positive sign (0.493), and (0.533) respectively. However, we have the negative sign for dummy variables 2011, 2012 and 2013, as follows, (0.458), (0.090) (0.411) respectively. The tourism in Egypt is considered to be a non-luxury service by foreigners. For other variables, which represent the relative price, the distance between countries, and a different time zone between Egypt and other countries, the model returned non-statistically significant results. This study can recommend to the decision makers in Egypt to put priority on investment in the tourism sector such as investments in infrastructures, communication, increasing number of rooms, which would further lead to increasing the number of tourists sending countries. Egypt has to invest money in this important sector, especially towards those countries, as they represent a large percentage of the total number of tourist arrivals in Egypt.

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EKONOMETRIJSKA ANALIZA FUNKCIJE TURISTIČKE POTRAŽNJE U EGIPTU: DINAMIČKI MODEL PANEL PODATAKA

U ovom radu autor istražuje funkciju turističke pittance koristeći dinamički model panel podataka na primeru Egipta. Panel podaci obuhvataju vremenski period između 1995. i 2014. godine, a pojedinci su 49 zemalja iz kojih dolaze turisti, što predstavlja 92% ukupnog broja turista u Egiptu. Uzete su u obzir neke objašnjavajuće varijable koje utiču na funkciju turističke potražnje: vremenski pomak zavisne varijable koja je bila razlog korišćenja dinamičkog modela panel podataka, upotrebom DIFF-GMM procenitelja koji su predložili Arelano i Bond (1991); kao i mnoge druge objašnjavajuće varijable kao što su BDP po glavi stanovnika, indeks cena, udaljenost, i "dami" varijable koje predstavljaju političku situaciju. Jedan od važnih i značajnih zaključaka rada je veliki uticaj zavisne varijable sa vremenskim pomakom (0,0493), koja se može objasniti kao usmena preporuka turistima prilikom izbora destinacije.

Ključne reči: *Dinamički panel podaci, Turistička potražnja, DIFF-GMM, Egipat*

FACTA UNIVERSITATIS
Series: **Economics and Organization** Vol. 14, N° 4, 2017, pp. 333 - 344
https://doi.org/10.22190/FUEO1704333R

Review Paper

RELEVANCE OF THE REGULATION OF INNOVATION WITH THE CHALLENGES OF INFORMATION TECHNOLOGY AND COMPETITION

UDC 330.341.1:339.137.2

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Abstract. *Intellectual property is directly connected with the competition law. On the other hand, it should be noted that innovation as a part of intellectual property rights makes a significant element of companies' activities if they want to be competitive in the market. This is the reason why it is possible to say that competition law belongs to rules of economic relationships. Law is important for companies in the sense of promoting economic efficiency. The competitiveness is the ability of a region to export more in value added terms than it imports. That definition is very important for companies and for investors at the same time. Due to that, governments have to pay attention to all possible so-called discounts, including an artificially low currency, suppressed wages in export sectors, artificially low taxes on traded sector firms and direct subsidies to exports. Governments, but also the legislators should control barriers and obstacles, in order to improve measurements to eliminate them. It could be a very important sign for the investor. Finally, intellectual property rights will show their significance through the companies' competition policy. The whole Europe develops research and development area, focusing on major competitors. Due to that task, participants are interested especially in the share of private investment in the field of research.*

Key words: *innovation, competitiveness, legislation, companies, investors*

JEL Classification: O31, D41

INTRODUCTION

Generally speaking about innovations, any lawyer has always had on mind differences between law and economics, on the onehand, and law and technology, on the other. Definitely, both aspects have to exist, as well as to share experiences and results. The

Received June 01, 2017 / Accepted September 26, 2017
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definition of innovation needs to be so wide in order to integrate both streams. But, the best solution could be to add the third element which involves a social impact. Law and economics theories pay attention to regulation for innovation. Often, the term *innovativeness* could be noted in literature. What is the difference, or maybe a better question is: is there difference between the two mentioned terms? Innovativeness would be defined as market failures, for example market power.

Lawyers and economists assume that innovation is good for welfare. Also, law and technology, on the other hand would help make up for that flaw to all interested participants in the economic relationships. The reason for that consideration is in the fact that it should be imperative to regulate the innovation, having regarded all mentioned aspects. The lawyers usually make difference between a horizontal dimension (time) and a vertical dimension (level of generality). Additionally, lawyers and economists, together, would point out in the other direction. They offer insights into so-called institutional models that allow a balance among law, economy and innovations.

The connection between the economic area and regulations on the other hand would maintain a certain level of openness or competition in product markets. OECD, through its principles, in 1996 made a step forward in regulations sense. This organization created some news, for example new products as a part of 'environment industry'. That was a condition for higher level of innovations. Generally speaking, that activity entailed more certitude for all economic participants in the innovative process, in particular regarding the intellectual property rights protection.

OECD organization prepared and presented the principles. But, as well as the others recommended by this institution, they are not obligatory. They belong to so-called soft law. Speaking about the sharing services under the EU Law, the group of new technologies involves innovations of telecommunications, as well as the Internet services. And the effects of insufficient competition in impeding technology diffusion are visible in the telecommunications sector. Having regarded the mentioned rules, it could be noted that they are under monopoly control in many countries. The principles of OECD are the example for that. Among Member states, only eight allow competition in the underlying telecommunications infrastructure. On the one hand, the mentioned act was amended in 1996. After that period, the innovation area, including the Internet in particular, became one of the most important ones for all possible participants in the business world. Statistic data show that usage of the Internet is five times higher in competitive than in monopoly markets (Hoj et al., 1996). On the otherhand, the diffusion rate for mobile phones is directly related to the national regulatory regime. OECD research shows that the monthly growth in subscribers per 1 000 inhabitants is less than 1%, rising to 1.7% in duopolies and to almost 3 percent in markets with open competition (OECD, 1996*a*).

1. FIRM SIZE, BUSINESS OPERATIONS AND INNOVATION

Intellectual property is directly connected with competition law. On the other hand , it should be noted that innovation as a part of intellectual property rights makes a significant element of companies' activities if they want to be competitive in the market. This is the reason why it is possible to say that competition law belongs to rules of economic relationships. Law is important for companies in the sense of promoting economic efficiency. Generally speaking, that principle involves the situation when the company produces what the consumers need, on the one hand, as well as does it at the lowest possible prices. In business

practice, there are different theories regarding the relationship between competition laws, first of all the concentration, on the one and innovation, on the other hand.

Definitely there are numerous different opinions regarding the connection between the companies and innovations. Also, in theories there are some significant concepts among social scientists. For example, Schumpeter introduced the principle that "*concentrated market structures* should favor technological progress mainly for reasons of static efficiency based on scale and scope economies" (Symeonidis, 1996). Following this concept, there is a proposal that the large companies have an important role in the innovation business. Several reasons could be found for that. For example, large companies are in a better position to finance serious research projects, and they do it from their own profits. This component is significant for companies due to the possibility to get expected benefits from innovations. Large companies know that every innovation improves their status on the market and puts them in a better position among the competitors. However, this opinion is formed following the principle that *competition among firms* favors innovation and technology development. It means that the absence of competition could result in less innovation. But business practice shows that all large companies do not share the mentioned opinion. Clearly, the companies that have monopoly market position would not be interested in innovation process, because they already control all or most of the market. The connection between competition and innovations is needed, definitely. Competition policy should be defined by law following the principles that the elimination of monopoly should help efficiency.

Competition policy, on the national level, as well as generally speaking, involves the competitiveness as obligatory element. Competitiveness is the ability of a region to export more in value added terms than it imports. That definition is very important for companies and for investors at the same time. Due to that, governments have to pay attention to all possible so-called *discounts*, including an artificially low currency, suppressed wages in export sectors, artificially low taxes on traded sector firms and direct subsidies to exports. Governments, but also the legislators should control barriers and obstacles, in order to improve measurements to eliminate them. It could be a very important sign for investors, including interested innovators.

The question is whether the company size is directly linked to its efficiency as well as market success, including innovation possibility. It means that the previous opinion could not be understood generally. It is clear that the value of competition to the innovative process, on the one hand, and economic studies of the relationship between company size and innovation, on the other, have got different problems.

However, there is an opinion that there is no general trade-off between the size of a firm and its innovative capacity. Generally speaking, innovation should be characteristic of all companies, no matter their size. Innovations have to be advances for all kinds of companies. There are many reasons for the mentioned conclusion. Large companies highlight the financial advantages in improving innovations and technologies. One of the main results of these activities could be higher productivity and product quality. Also, large companies should have a higher level of concentration as well as human resources regarding R&D intensity than other enterprises. At the same time, small- and medium-size companies may have advantages in producing so-called changes to products and technologies. They have to pay attention to the nature of innovation, as well as sectors of innovations development. Many of small and medium size companies will organize activities in cooperation due to research efforts, all in order to achieve the scope of advantages of larger companies (Symeonidis, 1996).

Obviously, serious legislators, but also business people know that there should be noted a higher level of competitiveness of companies among own competitors if they provide

investments in innovation procedures. That conclusion is one of the priorities of the European Union competition policy. Due to the previous principle, the European Union and the Member States need to ensure that the conditions necessary for the competitiveness of the Community's enterprises exist. The European Union 'reforms' in that area involves facilitating adjustment to structural changes as one of the most important steps. In addition, authorities have to encourage a necessary environment for entrepreneurship, particular in small- and medium-sized enterprises, their cooperation, and an environment. All these measures should make conditions for better exploitation of the innovative potential of enterprises.

In period 2001-2013 interesting results among European companies were noted. The Commission's Annual Growth Survey from 2014 defined some factors that are in position to generate fast growing 'innovation companies' on a large scale to the market. According to some authors' research, it is clear that the capacity of an economy to create jobs in fast growing firms in the most innovative sectors is the main source of GDP Growth (Harhoff et al., 2003; Putnam, 1996; Van Zeebroeck, 2011). For example, during the period 2001–2013, the European Union member states which have the highest effectiveness also noted an annual growth rate of their GDP. At the same time they make a triple of the rate of increase in GDP then the other European Union Member States.

European Union Commission is not the only subject under whose authority is innovation regulation and research. There are many interested entities. They are trying constantly to define advantages and obstacles in orderto improve the former and eliminate the latter. The Lead Market Initiative for Europe (LMI) was established in order to support markets that are highly innovative. It should provide solutions to broader strategic, as well as neccessary societal, environmental and economic challenges. The states which provide these conditions for innovators will have a strong technological and industrial base. Obviously, it would be easier to develop the innovative companies. However, it seems that this is easier in theory. Business practice shows that only a small percentage of defined companies reach a sufficiently significant size to establish themselves for the long term in the global market. Definitely, there is a lack of a sufficiently integrated system of innovation. Often innovations are put in market margins, leaving competitors to impose their norms or business cases.

Having regarded previous statements, according to the Operational Programme of Innovation and Competitiveness, adopted by the European Union (example Bulgaria) for period 2014-2020, this kind of legal act is needed and it should contribute to increasing the investment (it does not matter whether public and private) in the field of research and development, as well as innovation. Expectations are particularly connected to the sectors of manufacturing and services, and with the aim to achieve the national goal of 1.5% share of GDP of R&D costs in the named country.

Legislators know very well that regulations in the field of innovation has to be flexible enough in order to offer the best conditions for all participants. This is a serious aim as well as task, particularly for governments. They have to provide rules for covering interests of companies, innovators, and the other interested parties. These rules can be particularly onerous for small and medium-sized enterprises. It seems that this size of companies could be among the most technologically dynamic of enterprises. The opinion is that small- and medium-sized companies are suitable for establishing the business and at the same time encouraging innovations. But, this opinion should not be understood generally. As it is shown in table 1 in some countries the process of establishing a business can take months and incur substantial costs. Innovations need flexible rules, but rules nonetheless. Legislators have to pay more attention, especially to protecting participants' rights. Innovators are very interested

in that segment, as well as in security for their products. All mentioned elements have to have their own place in the innovation procedure.

Table 1 Comparison of formalities for setting up a business

COUNTRY (Type of firm)	Number of Procedures	Number of days	Estimated costs (ECU)
France (SARL)	15	28 - 56	1 900 - 4 600
Germany (GmbH)	8	56 -168	750 - 2 000
Greece (EPE)	24	21 - 70	750 - 2 000
Italy (SPA)	21	154	700 - 7 000
Ireland (ULC)	6	14 - 28	300 - 700
United Kingdom (PLC)	8	42	500 - 1 000

Source: European Commission (1995), Green Paper on Innovation

2. OBSTACLES TO INNOVATION

The regulation is one of the most important elements for innovation development. However, a whole complex of restrictions could be found in the field of innovations. This fact could be presented as an opportunity for innovative lawyers. Lawyers have a task to make systematization of services offering the chance to provide responsibility as well as competitive prices for companies as very important participants on market. Additionally, there is the importance of presenting the provision of packaged legal services. The possible prediction is that it is an unattractive area from a commercial point of view. On the other hand, this sector could be seen as such that keeping the competition out of the market is central to success. (Susskind, 2010, p.37). Companies are definitely capable of assessing the quality and risks of legal services delivered through markets. At the same time, companies are in the position to assess the quality and risks associated with very different inputs, for example accounting, investment banking, consulting. Companies have to keep in mind the significance and importance of innovation regulation. Due to that, many companies make decisions to employ attorneys - agents in the legal market, providing a high level of expertise. According to Richard Susskind (2010) the present challenge for lawyers is to continually innovate the new bespoke offerings. He presents his opinion in the following figure:

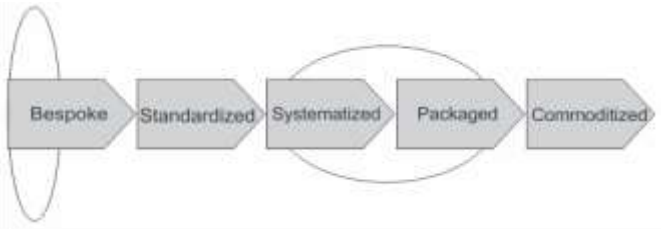

Fig. 1 Scope for innovation
Source: Susskind, 2010, p.39

The most important effect of regulation of the market for corporate legal services is the reduced innovation in legal products and services. For modern economy it is

significant that the law should make order in this area, bring innovation in legal procedure and definitions, for instance, provide the protection for all participants.

Generally speaking, law makes a few major well-known effects on innovation. Maybe the greater impact of professional regulation on the capacity for innovation in legal area probably comes from an indirect obstacle. What is an indirect obstacle-barrier? It could be defined as 'the homogeneity of the population of potential innovators' (Operational programme, 2010-2020). Legal regulation is a base for highlights the benefits of diversity. Lawyers work together with other experts. In their day-to-day work environment, legal work means that the information exchanged about problems, solutions, and practices is highly restricted. The limitations on diversity in 'the client pool' imposed by conflict-of-interest rules ensure further homogeneity of perspective.

Table 2 Barriers for innovation development in selected sectors

Sector	Specific to the sector barriers for innovation development	Interrelated obstacles to innovation
ICT	Inadequate system for protecting ICT's assets, such as innovative services and business process innovation	Shortage of skilled labor Lack of cooperation between businesses, universities and research units
Mechatronics	Large number of small players at the base line of the value chain	Energy inefficiency
Medicine and pharmacy	Undeveloped system and inappropriate infrastructure for research at initial stage and tests.	
Knowledge intensive services	Inappropriate system for protecting IP assets, such as innovative services and business process innovation Shortage of entrepreneurial skills Low level of information for funding opportunities and limited skills and capacity to access such opportunities Low level of cooperation between researchers and business.	Ineffective implementation of IPR Limited access to funding

Source: OPIC 2014-2020 aims also at overcoming main barriers to innovations in selected areas

The Innovation Strategy for Smart Specialization is one of the basic rules due to cover many different areas. Having regarded the legislators' aim, the Strategy should make efforts to harmonize existing solutions in the field of economic development, research and innovation. At the same time, the strengthening of the link between science and business is highlighted. The draft version of Innovation Strategy provides rules for vertical thematic areas. Vertical areas involve, for example, mechatronics and clean technologies, as well as informatics, biotechnologies, and new technologies in creative and recreative industries. On the other hand, there are also important areas, in so-called horizontal policies. They cover

ICT sector and resource efficiency, as well as technological niches. Operational Programme 'Innovation and competitiveness' form March 2015 defines investments in such a way that they are introduced as the first objective. A very important fact is that POIC supports activities exclusively within the thematic areas and previously mentioned horizontal policies of goals noted in research innovation strategy.

3. Regulation of the Intellectual Property Rights

Innovations should be seen as a part of intellectual property rights. According to the international law, the field of intellectual property rights involves different segments, such as patents, copyrights, trademarks, and the others. All of them highlight some common conditions. The first one is regulation; it means harmonization of the rules in European countries, not only the European Union members. And secondly, as previously mentioned, a very important degree of protection granted by the government to creators and inventors for innovation. Legislators have constantly to pay attention to providing a balance between rewarding inventors and invention's limitation and increasing the returns to R&D.

Intellectual property rights law is specified by some limitations. These rights are connected to national regulations, for example territory and timely limitations. In contrast, the other fields (branches) of law are understood as completely international. The result of that could be so-called *differences in national approaches* regarding intellectual property rights. But, this approach produces difficulties for multinational companies seeking to patent inventions in several countries. Having regarded this principle, OECD as international organization had an important role in defining the "*first-to-file*" rule. According to that rule, the first patent applicant has priority over any subsequent applicants. In other countries, there is the "*first-to-invent*" rule, characterized by application by which the innovator has to prove the development the innovation (in the United States, for example). Such regulatory differences underscore demands for greater world-wide harmonization (OECD, 1996).

Definitely, the protection of the intellectual property rights has to be in the focus of governments and the other interested entities. This imperative is the result of the present weak protection of intellectual property rights and limits. For example, limited patent duration, or extensive compulsory licensing would reduce the incentive to innovate. Often research and development (R&D) is understood as the main segment of intellectual property rights. It is correct that research and development involve all known forms of intellectual rights. Also, the expectation of an innovator from research and development is usually based on possible private returns to the investment which will justify the expense. Participants have to be very careful. The exclusive rights to exploit an invention provided by overly strong intellectual rights protection can lead to abuse or misuse of monopoly power. The matter of fact is that the benefits of innovation may be greater if it is spread more broadly through society. That could be possible in a case where the research and development provide increasing productive efficiency of the economy. The regulatory challenge is in providing the balance between the interests of the innovator and those of the public. In present economic conditions which are characterized by the globalization period, there are a number of concerns regarding the ability of traditional intellectual property regimes to stimulate innovation and at the same time promote technology diffusion.

Intellectual property rights will show their significance through the companies' competition policy. The whole of Europe, including the European Union members, develops research and development area, focusing on major competitors. Due to that task participants

are interested especially in the share of private investment in the field of research. It is therefore important to see if more appropriate framework conditions would allow maximizing the impact of public spending, as well as increasing the incentive for the private sector. Investing definitely has to result in more possibility of employment and income (The Global Competitiveness Report 2013-2014). The common fact for competitiveness and investment, according to the European economy policy is productivity. In addition, it the link between innovation and productivity could be observed. It is clear that the impact of research and development investment on productivity is very strong. According to Van Zeebroeck (2011, p.33-62), „public R&D intensity" is the expenditure on R&D performed in the public research system (higher education institutions and other public research organizations) as a % of GDP. The link has shown some serious problems, especially during the crisis after 2007 and 2008. The data noted lower results in all important areas: employment, productivity, competitiveness, and naturally in research. In order to improve their own results, the European Union countries tried to compare their position in mentioned areas with the same in the other productions, for example the United States or China. The comparison should show necessary changes, especially in order to make impact to investors' interests. The European Union has to be worried due to the shortfall of investment over the past few years. The investment was lower of around EURO 430 billion than in the previous period. According to the Commission Report that situation has a negative impact on the capacity for the EU to remain competitive in the long term.

The European Union makes some impacts and amends new legislation in the innovations area. The significance of the innovations is one of the priorities in European Union bodies. One of the basic acts is the Investment Plan for Europe. That act is the part of the Better Regulation Agenda. What is the main aim of the Agenda? It should constitute comprehensive packages of various instruments with mutually reinforcing impact. The market has shown different needs as well as questions, and the European Union tries to find possible solutions. Definitely, as the first step, the existing regulations should be improved in order to make better and stronger impact on innovation. According to the Investment Plan, the Agenda would achieve an optimal balance between predictability of the regulatory environment and adaptability to technological and scientific progress. Research and innovation performance in the European Union Report from 2014 defines all measures which have to be a part of regulations in order to provide approach to the assessment of the combined impact of legislation, involving increasing the effectiveness and coherence of the regulatory framework. Innovation is important not only for innovators but for countries, and local governments. All research that must be done before realization should check implementation issues that can affect outcomes. Also, in order to eliminate problems on national, regional and local levels, legislation should be the result of common interests belonging to participants in order to identify problems and seek solutions.

Generally speaking, the Commission's Agenda provides a framework for further work on innovation. For example, in addition to the "Lighten the load" website Platform is amended. That act provides the realization the interests among stakeholders on regulatory burdens, inefficiencies and obstacles. In 2015 the Commission introduced the Better Regulation Guidelines in order to provide a dedicated "Research and Innovation Tool". The meaning of that act is to define how to evaluate the positive and negative innovation implications of options for new legislative proposals. This is in line with the concept of so-called "innovation principle" (Fraunhofer, 2015). The Agenda involves the tools that allow the possibilities of the cumulative burdens to be identified. It couldbe important for companies and their market competitiveness.

Innovation is most important for companies that invest in this area. The importance of investing in innovation should result in high quality, as well as cost-effective regulatory framework. These elements directly make strong impact on the companies' growth. Companies definitely understood that it is "more important in their activities using or producing high technology". (Harhoff et al., 2003) Different forms of innovations make it possible to invest in many activities. Very fast development in technology area, particularly in the field of new technologies, improves intellectual property rights. It is the European Union, as well as the other interested entities that are trying to follow that development by appropriate legislation. There are numerous examples. Common characteristic is their positive impact: the Water Framework Directive, the Directives concerning Drinking Water, Groundwater, IPPC and Urban Wastewater.

Having regarded the beginning of regulation of the innovation involving connection with competitiveness, it is possible to find out the directives in the field of energy, as well as car industry. One of the examples is the general purpose of European Union regulation in order to reduce energy consumption for a given use of equipment or of cars. The aim is very clear, especially speaking about the European Union climate strategy to cut greenhouse gas emissions. Common benefit for all member states of such regulation is the positive effect on energy security. Three regulatory instruments are of importance: consumer-friendly color labels, mandatory energy limits and credible compliance (COM 2014/15).

Similarly, the End-of-Life Vehicles Directive 2000/53 and Annex II (the last in 2013) were amended in order to reduce waste arising from end-of-life vehicles (ELV) for cars and light commercial vehicles. That act has had and still has a significant impact on innovation in the car and car-related industries.

Also, legislators paid attention to the mobile telephones industry (GSM) and defined a European standard stimulating a breakthrough technology in mobile at the time, with a highly positive impact on the European Union mobile equipment industry's competitiveness.

Definitely, innovators are interested in certainties defined by legislations on different levels. The existing legal framework has shown possibility on at least two levels: European Union rules, as well as member state's law. The European Commission has a serious task during harmonization procedure. It seems that it is the only way to eliminate a regulatory obstacle. Barriers and obstacles are possible to be noted through the implementation of legal acts. In this way, potential barriers to innovation can be noted and highlighted. Member States governments would be involved in solving the problem but without derogation from the existing regulatory framework. It means that the European Commission should offer solutions that will be the result of involvement of authorities on all levels and with respect towards national characteristics.

There is no same answer from all European Union Members regarding legal base for the innovation-competitiveness relationship. The European Union adopted the Innovation Deals (IDEA, 2105). Previously, the Government of the Netherlands started with the implementation of the 'Green Deal' Programme. The Netherlands supports the national Green Growth policy. That policy involves and very successfully provides regulatory clarity for innovative solutions. Innovation Deals would support specific innovative initiatives. For example, it could be innovations that have only recent and limited or even no access to the market with the potential of wide applicability. The European Commission and the relevant Member State authorities stay on position that Innovation Deals would have the chance to find ways to avoid potential innovation barriers arising from the existing EU law or Member State implementation. Having regarded all possible differences in

national legislation, and European Union rules on the other hand, the Innovation Deals tries to eliminate some obstacles. Due to that task, the outcome of Innovation Deals would be considered by relevant Member State authorities for their policy and legislative actions. It is useful for member state authorities to ask for promotion in order to implement the Innovation Deals rule on their own economy, environment, growth and job creation.

After so many definitions, highlights of legal regulation needs, as well as different opinions and experiences, it is clear that competitiveness, innovations and economic efficiency are directly connected. In the 'sea of definitions' it is the World Economic Forum's *Global Competitiveness Report*, where the following note is being used for competitiveness: "the set of institutions, policies, and factors that determine the level of productivity of a country." Additionally, *World Competitiveness Yearbook* defines competitiveness similarly, but more broadly, as how an "economy manages the totality of its resources and competencies to increase the prosperity of its population." (IMD World competitiveness center, 2012) The situation in world economy is characterized by increasing globalization. The result of that is that the term competitiveness has become ubiquitous. The question is: what does it actually mean? On the one hand, there are opinions that competitiveness is equal with productivity, particularly if it is noted at national level and GDP growth (Putnam, 1996).

On the other hand, and it seems numerously so, the importance of making a difference between traded and non-traded sector industries is highlighted. And, it is important to make a difference among companies regarding their activities, as well as a significant share of their geographical area.

In addition, there are more specific definitions of competitiveness. But, the most interesting are definitions that have connection with innovation on the one hand, and economy on the other. Having regarded previous opinions, competitiveness relates only to the economic health sectors. The question would be how to know the companies will be competitive, and how they can realize the needed level. Definitely, the economy policies have to define sectors from which highly productive results regarding employment are expected, as well as the value-added ones in the sense of the amount of value that the named sector companies add to the inputs of production that they purchase. The problem could be in a situation when a stronger economy has larger impact of the value added on competitiveness.

4. THE SIGNIFICANCE OF INNOVATION

Why should competitiveness be compared with innovation definition? Generally speaking, competitiveness is almost always incorrectly equated with productivity.In turn, innovation is usually defined narrowly. The reason is in the prediction that the innovation is noted as only technological in nature. It means that innovation should result in new products. However, there are the other meanings of innovation. For example, innovation should be focused only on the research and development activities occurring at universities, national laboratories, and corporations.

Definitely, definitions could limit the core of any subject. The same situation is regarding competitiveness and innovations. In spite ofpossible limitations, definitions are necessary. Because of that, many organizations are trying to improve elements of definitions of these two institutions – competitiveness and innovations. One of the examples is the Organization for Economic Cooperation and Development that defines innovation more broadly as "the implementation of a new or significantly improved product (that is, a physical good or service), process, a new marketing method, or a new organizational

method in business practices, workplace organization, or external relations" (OECD, 2010). Additionally, innovations can make significant influence on the development process, using different segments. Among important elements, in the sense that innovations could not develop themselves, are technology transfers, production, as well as the deployment or marketplace usage.

In economic theory it is possible to find different comparisons among innovation, competitiveness, and productivity. For example, Bloomberg includes productivity as one of its seven variables for ranking the 50 most innovative nations (Susskind, 2010). It is clear that innovation is directly connected to productivity. But, there is no equality mark between both institutions and competitiveness. In business practice there are many possible situations when innovations have more or less influence onproductivity or competitiveness. A very good example in modern technology industry is that the innovation of the smart electric grid will help boost electric utility productivity, but at the same time it will do little to boost competitiveness, as electric utility services are not typically internationally traded (Radoshevich & Strogilopulus, 2012) In addition, the development of a new technology should result in better prediction of quality of life. At the same time, it does not mean that it would not directly affect productivity. Clearly, there is a completely opposite situation where some sectors or elements in some industries would improve the standard of life, but not lead to competitiveness. Having regarded previous statements, the conclusion could be that the innovation can increase productivity and competitiveness; it is not synonymous with either.

CONCLUSION

Innovation must be the priority for all participants. The first entity, in any sense should be the government, as well as the legislator. All levels have to be involved in making decisions. Having regarded the innovation as a focus, the actions that will be supported by different subjects should be defined. There are some activities organized in a way of supporting, not at all as a limit for innovations and innovators. Legislation and entities that implement the rules should provide the development of cooperation for innovation between companies, as well as between business and academic subjects in order to improve the innovation process.

One of the necessary steps is definitely the development and introduction of new products, processes and business models in companies. Following, innovation process cannot be completed without supporting for development of environment and research and innovation infrastructure for business needs.

Finally, innovation process is characterized by the development of cooperation for innovation. Obviously, cooperation is needed between companies, as well as 'business world' (it means investors) and academic researchers. Examples for that statement are implementation of different projects, involving clusters and participation in pro-innovative European Union networks and platforms. Participants have a task to lead to the development of innovative capacity and sharing resources for the development and implementation of innovative processes and products, protection and transfer of intellectual property rights, such as copyrights and license royalties, and commercialization of the results.

Also, mutual cooperation could be supported through the development of technology transfer entities, agencies and technology centers, for example. Support will focus on science-business relationship management, intellectual property rights, researchers' awareness regarding intellectual property rights and commercialization.

Acknowledgement: *The paper is result of the Project 47005 financed by Ministry of Education, Science and Technological Development of the Republic of Serbia*.

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RELEVANTNOST REGULISANJA INOVACIJA SA IZAZOVIMA INFORMACIONE TEHNOLOGIJE I KONKURENCIJE

Intelektualna svojina je direktno povezan sa pravom konkurencije. Sa druge strane, neophodno je znati da inovacije kao deo prava intelektualne svojine predstavljaju značajan elemenat aktivnosti kompanija, ukoliko žele da budu konkurentne na tržištu. To je razlog zašto je moguće reći da zakoni o konkurenciji pripadaju pravilima ekonomskih odnosa. Zakonodavno regulisanje je važno za kompanije u smislu da promoviše ekonomsku efikasnost. Konkurentnost je sposobnost regiona da izvozi više u odnosu na dodatu vrednost u odnosu na uvoz. Ta definicija je veoma važno za preduzeća i za investitore u isto vreme. Zbpog toga vlade država moraju obratiti pažnju na sve takozvane popuste, uključujući veštački nizak kurs valute, iznenađujući naknade u sektoru izvoza, veštački niske stope poreza i direktne pomoći izvozu. Vlade, kao i zakonodavci, moraju kontrolisati barijere i prepreke, u cilju poboljšanja mera koje bi eliminisale te prepreke. To bi bio veoma važan znak za investitore. Takođe, prava intelektualne svojine pokazju svoj značaj putem razvoja politike konkurencije koja se odnosi na kompanije. Cela Evropa ulaže u razvij istraživanja, fokusirajući se na najvažnije učesnike. Zbog tog zadatka, učesnici su posebno zainteresovani za učešće privatnih investicija u oblasti istraživanja.

Ključne reči: *inovacije, konkurencija, regulativa, kompanije, investitori*

FACTA UNIVERSITATIS
Series: **Economics and Organization** Vol. 14, N° 4, 2017, pp. 345 - 357
https://doi.org/10.22190/FUEO1704345J

Review Paper

MODEL OF OPEN INNOVATIONS AND SMALL AND MEDIUM-SIZED ENTERPRISES DEVELOPMENT

UDC 330.341.1:334.012.63/.64

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Abstract. *The paper discusses characteristics of the model of open innovations as an inseparable part of operations of contemporary enterprises and their influence on the development of small and medium-sized business. It starts from the viewpoint that small and medium-sized enterprises make great efforts to use their potentials for growth and development in the best possible way by using the model of open innovations. These efforts involve reliance to own innovation activities and use of external sources of innovations, i.e. the sources which promote the chain of values through external commercialisation of the right to intellectual property at their disposal, as well as commercialisation of the knowledge and innovations of others. These business entities have certain advantages in the innovation process which make them a suitable partner for network connectivity, since they are less bureaucratically organised and often have a pronounced motive to be more successful than large enterprises.*

Key words: *knowledge, innovations, concept of open innovations, small and medium-sized enterprises*

JEL Classification: O30

INTRODUCTION

In economic theory, the phenomenon of innovations has received great attention for the last twenty years. This is understandable when it is known that the capability of innovation predominantly determines possibilities of growth and development of enterprises and economy as a whole. Only those economies with a great number of enterprises which efficiently

Received August 28, 2017 / Accepted October 16, 2017
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commercially transform knowledge into innovations can provide high employment rate and income of the population, thus creating conditions for future sustainable economic growth.

Traditional model of business activity of an enterprise which functioned until the end of the twentieth century implied a model of closed innovations. The innovation activities of an enterprise were determined by the knowledge and technology at their disposal. The enterprises were not extremely interested in changing their successful business model and the established relations with their customers (Greenhalgh & Rogers, 2011). The enterprises tried to optimise the time of promotion of new products, which would provide new values for customers and creation of competitive advantages on the market (Mroczkowski, 2012).

The advanced development of science and technology, mass use of increasingly powerful information and communication technologies and the Internet, the availability of the large amount of information and knowledge, the change of structure and mobility of labour, market globalization, changes of habits, needs and wishes of customers, as well as a whole series of events directly or indirectly conditioned by globalization led to gradual obsolescence of the closed business model, and hence the concept of closed innovations in the last decade of the previous century. According to a more comprehensive explanation, business model is a system which shows how an enterprise selects its customers, defines and adjusts its activities, classifies jobs that should be done in and out of the enterprise, optimises its resources, comes on the market, creates products and services for its customers and makes profit (Pourdehnad, 2007). The open business model supports and improves cooperation with the environment, exchange of ideas, knowledge, means and technologies, intensifies innovative activities of an enterprise and better satisfies the needs of customers (Rahman & Ramos, 2011).

The model of open innovations (OI) was developed in order to enable an enterprise to respond to current demands related to innovation activities, development of new products, services, and markets, new methods of satisfying customers, protection and use of intellectual property. The model respects the necessity of mutual connection and cooperation between various enterprises in order to decrease potential risks and expenses of not only innovative activities but also entire business on the one hand, and on the other hand increase the efficiency of innovation process at the same time (Rahman & Ramos, 2011).

Besides numerous influences on the development of business in this century, the affirmation of the OI model significantly contributed to the promotion of a great number of new small and medium-sized enterprises (SMEs) which, thanks to joining ideas and necessary resources became an increasingly respectable segment of world economy. For example, the contribution of SMEs in the non-financial business sector is considerable in the EU. SMEs make up 99.8% of all enterprises, 57.4% of value added, and 66.8 % of employment. In 2015 just under 23 million SMEs in the non-financial business sector generated €3.9 trillion of value added and employed 90 million people (Annual Report on European SMEs 2015 /2016, p. 3).

With their flexibility and speed of reaction, SMEs reduce the time necessary for a new product to be developed and offered on the market. New model of business activity involves not only competitiveness between various enterprises, but also cooperation through diverse forms of strategic partnership, as well as creation of other more or less formalised forms of business cooperation. The establishment of cooperation on other bases is especially significant in the domain of innovations where the knowledge transfer has become fundamental for successful innovation process.

Both developed and developing economies focus on innovations, thus competing globally for talents, resources and market shares. Information trends and networks are spread over borders in the processes that were inconceivable before the development of the Internet, such as global introduction of mobile telephony and social networks and rapidly increased access to the Internet. Business models are redefined, jobs are redesigned and the number of SMEs increases (OECD, 2010).

SMEs are a driving force of contemporary economies due to the contribution which is reflected in technological innovations, employment, increase of export, dynamics of competition, etc. The capabilities of SMEs for innovations are of great significance because innovations provide competitive advantage to the enterprise, its branch of activity and economy as a whole. New and existing innovative SMEs contribute to the increase of productivity and competitiveness of economy, thus ousting the enterprises with lower productivity. Innovation is a powerful means for new SMEs to successfully come on the market and change current situation, while allowing the existing enterprises to maintain or improve their position on the market thanks to improving their innovativeness. Innovative SMEs participate in the knowledge transfer within the innovation systems, less as passive knowledge users and increasingly as the significant source of knowledge.

Bearing in mind the previously explicated statements, the aim of the paper is defined as an attempt to explain closer basic characteristics of the OI model and especially its significance for the development of SME sector.

Besides the introductory comments, conclusion and the literature references, the structure of the paper includes three sections. The first discusses the commercialised knowledge of innovations as a driver of economic development and specific source of dominance in contemporary conditions of manufacturing. The second explicates the logic of the OI model with special reference to commercialisation of knowledge in innovations often created outside of an enterprise. Finally, the third section investigates the advantages and limitations of the application of the OI model in SMEs.

1. The Commercialized Knowledge of Innovations Initiates Development and Becomes the Foundation of Economic Power

Throughout a major part of human history the management of territories and property over natural resources was the symbol of power and wealth of some countries. This began to change after the industrial revolution at the end of the eighteenth century. With each stage of technological development, the importance of knowledge increased in comparison to physical production factors (Mroczkowski, 2012). Nowadays, small countries without natural resources can have enormous economic potential, primarily thanks to their capability to commercialise knowledge of innovations. In last decades, mutually dependent and connected, radical technological innovations led to basic changes of economic structures and change of position of certain countries on the list of the most developed counties in the world (Cvetanović et al., 2012).

At the turn of the twentieth century it was traditionally considered that the research at universities or by independent researchers should be outsourced by industry (Haules, 1999). Even for pharmaceutical industry, which, at the time, dominated over commercial valorisation of knowledge this was the most favourable method to conduct scientific

research until the First World War. It was in the years between the two wars that the activities of research and development (R&D) gained affirmation within leading companies in industrially superior countries such as the USA, Germany and Great Britain (Mroczkowski, 2012).

The closed model of innovations functioned relatively well for some time. However, the competition in discovering optimum innovation processes especially intensified in the second half of the past century (Rotwhel, 1992). Many authors think that the period from 1950s until the end of the twentieth century includes five generations of innovations. Each of those generations was meant to improve or continue the previous model (Trott, 2002).

The innovations of the first generation were predominant in the nineteen fifties and sixties. They were based on the idea of R&D within a company as a key source of new technological solutions. Innovative solutions were a direct result of commercialisation of scientific discoveries which were made at enterprises. The model absolutely neglected customer and market needs as drivers of innovative activities in an enterprise.

In the nineteen sixties the second generation of innovations was promoted. This was also an innovation process with the linear trend but based on demands, i.e. unsatisfied market needs.

The idea which initiated the third generation of innovations was feedback. Communication and feedback together connected science and technology with market demands. The task of innovation process management primarily included promotion of integration within the sector of research and development, related to sales and market research.

The fourth generation of innovations was a result of increasing competitiveness between enterprises. Time became a significant factor of competitiveness, as well as the capability of an enterprise to provide quality standards and elicit ideas for improvement of innovativeness from customers and suppliers. At the same time, the enterprises realised that integration in R&D domain was a significant presumption of their technological and economic progress.

The fifth generation started in 1990s. It differed from the previous ones in its simultaneous occurrence, not following the foregoing generation. It arose in the period of significantly higher risks as a result of the increasing economic globalization. Due to the nature of such environment, enterprises had to maintain high levels of flexibility and responsibility.

With the help of open business models, enterprises can create significantly more ideas and include them in the process of creation of added value with external environment by using various methods. The knowledge that is transferred to other business partners on commercial basis provides enterprises with efficient use of own knowledge in the situations when they believe they cannot commercialise it (Chesbrough, 2007).

Out of five models, the first four belong to the category of closed innovations, since they are all characterised by the fact that the enterprise realises the activities of innovation process within the framework of own resources, while the fifth model is represented by OI (Chesbrough, 2006). Naturally, the mentioned generations of innovation process cannot be treated as final. On the contrary, "with great amount of confidence it can be stated that creativity and innovativeness are going to be most appreciated as both personal and group identifiers and the most reliable 'ticket for future' to each upcoming inhabitant of this

only planet. Therefore, future analysts of these issues will certainly speak about the sixth, seventh, eighth and who knows which generation of innovations" (Pokrajac, 2010).

The network model is in fact a kind of open innovation because it relies on externalisation in order to complete the activities necessary for the continuation of an innovative process. "The networks that exist between various enterprises are the means by which they join or exchange procedures and work together on the development of new ideas and abilities. The cooperation between enterprises in the domain of innovations can include the scope of tasks from the simplest (joint purchase of necessary inputs) to the most complex (cooperation in research and development activities) in the overall process of development and commercialisation of innovations. In cooperation it is possible to decrease risks and expenses, while at the same time increase the effects of development of innovations, hence it is often connected with their successful commercialisation. The level of cooperation depends on harmonisation of the available means, capabilities and business strategies of partners, which is reflected in transparency of the mutually set aims and abilities of the involved enterprises to fulfil them" (Cvijić et al., 2013).

The twenty-first century has brought enormous growth of economies led by innovations. New forms of competitiveness have begun to completely reshape the market of knowledge and innovations into global market which develops some new tendencies. The increasing expenses of R&D in public and private sectors lead to the increase of knowledge offer, i.e. the production of knowledge has become global industry. In turn, global competitiveness, especially in the sector of new technologies continues to increase the demand for knowledge. In fact, enterprises have entered global race for market-attractive innovations in the branches such as energetics, bio-pharmacy, new materials, and electronics. Multitude of institutions are involved in this competition at various locations where new knowledge is being created. This wide circle includes private enterprises, consulting sectors, state laboratories and numerous universities. All those organisations compete to find the fastest and most efficient routes to new knowledge – the knowledge that may be transformed in new or better products and services for the customers worldwide (Narayanan, 2001).In short, new ideas transformed into innovations are a key premise of economic success at all levels. Bearing this fact in mind, a theoretician of economy of knowledge, Paul Romer (2007) brilliantly noticed that the so-called meta-ideas were the most important for economic and social progress in this century. According to Romer, meta-ideas are related to how to support the production and exchange of other ideas. Pointing to the fact that the British invented patents and copyright in the seventeenth century, while citizens in the USA designed research at universities and practically first applied many significant innovations in the agriculture in the nineteenth century, and initiated rapid development of new models of research in the twentieth century, Romer comments that designing the institutions which will provide higher level of R&D activities in private sector is a challenge for industrial countries in this century. Globally networked innovation is exactly such a meta-idea for the twenty-first century. Therefore, innovativeness is becoming a priority in the actions of an enterprise. "Every enterprise should consider how to change its position from 'competitiveness for existence' to 'competitiveness for achieving preferential position' thanks to defining future innovative value which involves new business, economic and social-cultural models" (Lalić et al., 2012, p. 238). The model of OI is undoubtedly a significant instrumentation on this pathway.

2. THE OPEN INNOVATION MODEL

The OI model provides the growth of innovativeness due to the fact that it integrates creative potentials of a large number of people. Good ideas and inventions come from various, unexpected locations, not only from research laboratories, but also from other organisational units, from customers, suppliers, joint ventures, even from the public (Smith, 2006).

The OI model is an integral part of contemporary business model of an enterprise. The concept has vitally changed a predominant model of designing innovations in this century. Chesbrough (2006, p. 1) defines the OI model as utilisation of meaningful influx and drain of knowledge in order to advance internal innovations and their market extension based on external innovations. A number of analysts go a step further considering the OI model more complex than mere use of external ideas and technology. In their opinion it is the change of model of utilisation, management, employment and creation of intellectual property (West & Gallagher, 2006, p. 351).

The initiating idea of the OI model is a strategy of business enterprises based on commercialisation of knowledge of innovations, created often outside the organisation. Enterprises have to be capable of using both internal and external innovations in a profitable way (Afuah, 2003). Due to the fact that a great number of innovations are in an enormous network of inventors, these abilities of enterprises are mostly in the function of successful management over partnerships and network transactions (Cvetanović, 2011).

The OI model assumes that enterprises can and should use not only internal ideas and knowledge, but also external ideas and knowledge together with external and internal means for commercialisation of ideas and knowledge on the market. Many tools which are applied in the concept of OI (e.g. licensing, joint agreements on research and development, business angels, venture capital, "spin-off", etc.) appeared long before the model was realised in theory and practice, and they completely fitted in this model.

In the OI model, the innovation has to be adjusted to global environment. It has to enable internal or external knowledge transfer and include all stages of development (Rahman & Ramos, 2011, p. 471). The OI model develops in globalized environment where knowledge becomes widely available thanks to connections (primarily through the Internet), and where individual enterprises (SMEs above all) do not have enough resources to independently realize necessary R&D activities, but can instead cooperate, purchase, hire or license processes or inventions (such as patents, intellectual property etc.) to other enterprises, organisations or institutions (laboratories, institutes, etc.). Also, internal inventions which are a result of innovation activity of an enterprise but cannot be well commercialised on the market (changed strategy of business, or lack of resources for commercialisation) can be sold to other enterprises (e.g. through licensing, joint ventures, spin off, etc.), and thus generate additional income.

The OI model implies that enterprises can and should use external ideas, knowledge and technologies equally as internal, together with internal and external methods for commercialisation of innovation results on the market. In the OI model enterprises can continue to initiate and maintain innovations within an enterprise, while at the same time they can rely on alternative ways to present their ideas on the market and benefit from external knowledge. In the IO model it is clearly seen how input and output routes of knowledge transparently transform into economic value and how rapid development of a

product and marketing create ideas which lead to development in the chain of values (Vanhaverbeke, 2006).

Numerous factors have led to the development and application of the OI model. Obviously, technological intensity of production has increased in many branches, thus even the enterprises with respectable R&D sector are not able or are not ready to rely only on own technological development (Gassmann, 2006, p. 224). The innovation process becomes increasingly complex, whereby a great number of complex scientific problems demand interdisciplinary approach to research which, as a rule, results in great expenses and more pronounced risks in the process of innovation (Howells et al., 2003, p. 398). Thus it happened that the enterprises which are not competent enough in certain domains entrust other organisations or enterprises with the research, whereby still develop technological knowledge on their own in the domains that are most significant for them (the so-called hard technological core).

Contemporary enterprises need not have the latest or best knowledge at their disposal in order to succeed in the present conditions. The key of success is to combine the internal, already available knowledge well-timed with the available external knowledge and by using thus created knowledge, find new innovative solutions and gain benefits on the market. If open enterprises want the external knowledge and information to be beneficial and contribute to their better functioning, it is necessary to build own innovation capacity, i.e. to investigate the possibilities of creation of new knowledge within the enterprise. When they get new external knowledge it is important to properly adopt itand combine with the existing knowledge at the enterprise. External knowledge does not have any utility value for an enterprise if it is not integrated and combined with the internal knowledge. The quality of thus obtained network of internal and external knowledge determines the quality and efficiency of innovation process, i.e. innovation potential of an enterprise (Cvijić et al., 2012, p. 76). This means that enterprises have to be ready for establishing strategically significant connections with other enterprises that have knowledge, skills and experience, necessary for further successful development of innovation process.

The possibilities for enterprise to get significant ideas, knowledge and technologies externally is conditioned by the capability and availability of external suppliers, i.e. development and quality of external basis of innovation knowledge. The existence of available suppliers who can offer suitable quality (which often exceeds the quality which the enterprise can internally achieve) makes possible for enterprises to entrust certain functions in the chain of value to other enterprises, thus enabling them to concentrate only on those values in the chain which are the most beneficial for them, or which can be better realised in comparison to other enterprises on the market.

Due to mobility on the labour market the employees can leave their enterprises and go to other or found their own enterprises which they can finance independently or as a joint venture. The risk that the labourers who leave the enterprise simply take along key elements of the innovation process which was previously developed in an enterprise is real. It means that other (often competitive) enterprises can thus gain significant, previously developed innovation knowledge (West & Gallagher, 2006, p. 319). The increasing private investment creates considerable risks for the enterprises which largely rely on internal innovations, since greater possibilities for joint ventures increase the tendency of some employees to establish their own or join to the existing, newly founded

enterprises (Rigby & Zook, 2002, p. 83). They are interested in newly established enterprises since they consider their offer more favourable in terms of risk and earnings.

The existence of branch convergence is a factor which also influences the development of OI model. Branch convergence is the deletion of boundaries between economic activities due to convergence of ideas, technologies and markets (Choi & Valikangas, 2001, p. 426). It basically represents the influence of innovation development in one economic activity on the development of other activities. Convergence appears when the enterprises in one branch apply the knowledge which is fundamentally developed in other branches; thus successful innovations change and complement innovative and technological paradigm of other branches. The influence of innovations in information technologies on business in all other industrial branches can be taken as an example.

The OI model is especially suitable for application in service activities based on knowledge and high technologies where enterprises most often simultaneously offer products and services. Large enterprises often form separate organisational units which follow OI and strategies that are focused on innovation projects beyond basic economic activity of the enterprise, thus making efforts to keep pace with dynamic branches of economy.

Customers also have a significant role in the development of OI concept. Many customers are innovatively oriented; they tend to improve the existing products and services of the enterprise, thus becoming innovators themselves (Bogers et al., 2010). Customers as innovators often do experiments related to aesthetic and functional characteristics, purpose and terms of use of the existing products, provide ideas at beginning stages of development of new products and services, suggest new forms of relationships between the enterprise and customers, etc. Thus enterprises with the help of their customers as innovators reach adequate innovation solutions and satisfy needs on the market through new or improved products or service. The enterprises which apply open innovation model in their activity, include the existing and potential customers in the innovation process, thus increasing their innovative possibilities (Dogston et al., 2008).

The OI model has been developed as a response to current demand related to innovation activities of an enterprise, primarily in the domain of R&D and protection and use of intellectual property by the enterprise. The model emphasizes the need for more active cooperation between various enterprises in order to decrease potential risks and expenses and simultaneously increase efficiency of the innovation process and better commercialise the ideas on the market. It is especially suitable for SMEs which now, compared to the previous period, have the opportunity to influence market trends by joining ideas, innovation activities and investments. In new conditions the advantages immanent to SMEs are especially pronounced such as flexibility and speed of reaction to market changes. The model provides reduction of time necessary for the development of a product and its appearance on the market. SMEs have a chance to leave behind large enterprises, thus providing competitive advantage.

3. POSSIBILITIES AND LIMITATIONS OF THE APPLICATION OF THE OI MODEL IN SMES

SMEs sector is often the most significant part of innovation efforts in a certain economy, unlike large enterprises which act as an integrator of overall innovation system (Cvetanović et al., 2016). Since in economy of knowledge SMEs operate in global environment it is necessary for them to establish cooperation with both larger enterprises in order to create better possibilities and increased use of their capacities, and other SMEs engaged in the same or different economic activities together with research centres, institutes, laboratories, independent researchers, universities and all other subjects which could contribute to their innovation development. The increase of global competitiveness and the increase of R&D expenses oblige SMEs to cooperate with external partners in order to promote new products and services on the market before their competitors. At the same time, the innovation will be better accepted if the users of products and services, either other enterprises or individual customers, become increasingly involved in the innovation process (De Backer, 2008).

Two aspects of cooperation are present between SMEs and other participants in the innovation process. The first is resource transfer (knowledge, ideas) from SMEs to other enterprises when the existing technological possibilities of SMEs are used externally. The second aspect is related to external to internal exchange where external sources of innovations are used for improvement of the existing innovation development in SMEs. SMEs combine both types of cooperation with their environment in order to improve innovation performances and maximise benefits from innovation efforts (De Vrande et al., 2008). Thereby, they can focus on four approaches to the OI model: joint R&D activities; b) joint development of a product; c) joint promotion of a product and d) attraction of similar enterprises to create positive environment by cooperation (West & Gallagher, 2006, p. 36). In order to develop SMEs successfully and commercialise new products and create remarkable innovation performances they have to cooperate with external partners (Pullen et al., 2008).

Successful strategy of the OI model for SMEs should find creative methods to utilise internal innovations and the available external innovations which contribute to the development of an enterprise. SMEs have certain advantages in the innovation process which make them a suitable partner for connection, since they are usually less bureaucratically organised and generally are more motivated to be more successful than large enterprises (Pullen et al., 2008).

Networks are globally considered valuable because they provide the solution for preservation of flexibility of productive values of SMEs (Acs & Audretsch, 1988). By networking, some of the barriers encountered on the way to creation of innovations in these business entities are removed without destruction of their key advantages. In this sense, a number of authors investigate how market uncertainties contribute to the increasing networking of SMEs. The conclusion is that in the situations when innovation process is a complex system which exceeds the framework of an enterprise, networks provide successful technological cooperation with very pronounced synergic effects (De Bresson & Amesse, 1991).

The advantages of SME networking include innovation chances, lower transaction costs, cost shares, increase of efficiency of innovation process, and increased production efficiency. Networks provide the share of risks, costs of studying and other expenses that

help technological convergence between enterprises, which results in the growth of manufacturing efficiency as well as economy of scope. Due to their integrated processes of production, each enterprise has to be concentrated on individual component of their joint final product and more complete access to information (Dirckinck-Holmfeld, 2009).

SMEs have a crucial role in diversification of innovations in numerous market niches, i.e. domains which are not attractive for large enterprises, bearing in mind possible relationship between potential benefits and risk level. With their activities they often change the limits of production and consumption while searching for the neglected possibilities of creating new jobs and improvement of labour productivity (Michael & Palandjian, 2004).

Lately, SMEs have become more important in the domain of creation of technological innovations. However, due to the fact that the capability of SMEs to compete on global markets is limited by internal and external conditions (Table 1), the cooperation between enterprises aimed at improvement of innovation has become a significant means by which these business entities overcome some of the barriers. The cooperation between SMEs and large enterprises is becoming a strong force in many industries today.

Table 1 Barriers of open innovation for SMEs

External barriers			Internal barriers		
Supply	Demand	Environment Resource	Resource	Culture/ human nature	System
Technological information	Customer needs	Government regulations	Lack of internal funds	Attitude of top management to risk	Out-of-date accounting system
Raw materials	Customers' perception of the risk of innovation	Anti-trust measures	Technical expertise	Employee resistance to innovation	
Finance	Domestic market limitation International market limitation	Policy actions	Management time		

Source: Rahman & Ramos, 2011, 480.

Some limitations make the application of the OI model in SMEs difficult. These enterprises have insufficient resources, hence their planning relates to medium time period at most. Real incapability of SMEs to make long-term plans significantly decreases their capability to access the results of external research. It is not always easy for SMEs to enter the sustainable chain of values on the market, since they are focused only on short-term market promotions. SMEs even do not often have well-developed medium-term planning of demand due to limited resources and lack of necessary network of contacts. Time mismatch of framework of research of external partners (e.g. universities) with the real needs of SMEs can make a problem, which often does not allow them to appear aggressively on the market with the proper product at the right moment. SMEs often have problems related to financing of research, lack of qualified staff and a small chance for replacement of adequate products on the market, limited possibilities to promote products etc. Besides, there is a large number of other internal and external barriers to innovations in SMEs which partly decrease and

complicate successful application of the model of open innovation, but they certainly do not reduce the significance of its application for successful innovation development (Hanna, & Walsh, 2002).

Changes in business environment (growth of income, increased number of market niches, technological changes and development of open innovations) decrease structural disadvantages of SMEs which arise from their limited possibilities for application of economy of scope and management of innovation processes. Innovative SMEs have become the most significant developmental potential of contemporary economy. However, due to conditions in which they operate, insufficiently motivating business environment which is not properly adjusted to the developmental needs of innovative SMEs, a large number of SMEs do not recognise the importance of innovations or do not have necessary conditions to completely realise their innovation potential.

Innovative SMEs are faced with numerous problems and barriers, primarily related to financing, availability of results obtained in research institutions, access to the international market, administrative barriers and possibility of engagement of qualified staff, etc. All these create the need for systemic, well-designed policies and specific supporting programs which should allow SMEs to use their development and innovation potential.

There is also disproportionate distribution of innovations within the SMEs sector between a small number of highly inventive SMEs with enormous potential for growth and a large number of SMEs without clearly expressed innovation orientation and great innovation potential. Therefore within the policy of stimulation of innovations, a clear difference between these two groups of SMEs should be made, i.e. it is necessary to understand and respect the differences in their business conditions, methods and motives for innovations.

SMEs are faced with significant barriers and limitations which have negative influence on their ability to innovate. These barriers are not the same for every enterprise, and the enterprises can have direct effect on their removal. Besides internal, significant barriers to innovations are external barriers which SMEs cannot directly influence, but are forced to adjust to them. These barriers arise from institutional and market environment that affects all small and medium-sized enterprises on the market.

CONCLUSION

The OI model has been developing since the end of the twentieth century. It reflects the efforts of an enterprise to use the available resources in order to acquire new knowledge and thus commercialise innovations. It prefers increasing mobility of labour, especially highly creative professional one. It accepts increasing business risks and initiation of business ventures, which is especially suitable for the development of SME sector. Key advantages of the OI model are greater possibilities of application of innovations, both own and from the environment. This suggests business model which is based on the decision whether cooperation is better than competition. The OI model is favourable for the development of SME sector, which has become increasingly important lately in the process of creation of technological innovations. Due to the fact that the capability of SMEs to compete on global market is limited by many conditions inside and outside the enterprise, the cooperation between enterprises in order to improve innovations has become a significant means by which these business entities overcome some of the barriers. The cooperation between SMEs and large enterprises is a considerable developmental force in many industries.

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MODEL OTVORENIH INOVACIJA I RAZVOJ MALIH I SREDNJIH PREDUZEĆA

U radu se sagledavaju karakteristike modela otvorenih inovacija kao neodvojivog dela poslovanja savremenog preduzeća i njihovog uticaja na razvoj sektora malog i srednjeg biznisa. Pošlo se od stava da pomoću modela otvorenih inovacija mala sreddnja preduzeća nastoje da na najbolji mogući način iskriste mogućnosti za rast u razvoj. To nastojanje podrazumeva oslanjanje na vlastite inovacione aktivnosti, ali i na korušćenje spoljnih izvora inovacija, odnosno izvora koji promovišu lanac vrednosti kroz eksternu komercijalizaciju prava na intelektualnu svojinu kojom raspolažu i komecijalizaciju znanja i inovacija drugih. Ovi poslovni entiteti imaju određene prednosti u inovacionom procesu koje ih čini pogodnim partnerom za mrežno povezivanje, budući da su manje birokratski ustrojena i često imaju izraženiji motiv da budu uspešnija od velikih preduzeća.

Ključne reči: *znanje, inovacije, koncept otvorenih inovacija, mala i srednja preduzeća*

FACTA UNIVERSITATIS
Series: **Economics and Organization** Vol. 14, N° 4, 2017, pp. 359 - 372
https://doi.org/10.22190/FUEO1704359M

Review Paper

COVERED BONDS: NEW OPPORTUNITY FOR RECOVERY OF SERBIAN CAPITAL MARKET

UDC 336.763.3:336.76(497.11)

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Abstract. *At the beginning of the XXI century, Serbia entered into transition process toward open market economy. One of the segments which should be developed in accordance with market economy principles was financial markets, more precisely capital market. Recovery of the Belgrade Stock Exchange and increasing trend in the first half of the XXI century gave optimism in prospective development of the Serbian capital market. Unfortunately, Serbian capital market did not make expected progress. In this paper, the situation on the Belgrade Stock Exchange is analyzed, trading with equity and debt instruments, emphasizing deficiencies which caused insufficient level of development of the Serbian capital market. As many opportunities for growth have been missed and capital markets are at the stagnant level for years, there are new, sophisticated products which could give an impulse to further development of financial markets. An example of such products is covered bonds, type of debt instruments with widespread use in the European Union. In this paper the main characteristics of those products are elaborated with experiences in other countries that could be very useful for Serbia.*

Key words: *covered bonds, debt instruments, capital markets, initial public offerings, credit rating agencies*

JEL Classification: G21, G24, G31

INTRODUCTION

Overall level of capital markets is one of the most significant pillars for the development of each country, especially of countries that are focused on open market economy principles. The role of capital markets in the global economic and financial system is indisputable (Erić,

Received July 27, 2017 /Revised August 31, 2017 / Accepted October 16, 2017
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2013). According to "Global Competitiveness Report 2016-2017" published by World Economic Forum, Serbia is ranked 90th out of 138 countries (Schwab, 2016). Observing the financial market development pillar, the positioning of Serbia is even worse. Namely, Serbia is ranked 110th out of 138 countries, with the average score of 3.4 (scores are distributed between 1 and 7). Within the financial development pillar, Serbia has the best rank in the segment of access to loans (73th place, with the average score of 3.8) and only in two more segments is Serbia positioned higher than 100th place (i.e. 99th place in the segment of soundness of banks with the average score of 4.3 and 68th place in the segment of legal rights measured by appropriate index, with the average index of 5 – whilst the index is set between 0 as the worst and 10 as the best). The above mentioned describes that Serbia is not among countries with well-developed financial markets, indicating that there is a lot of space for improvement in the future.

In Serbia there is an absence of initial public offering (hereinafter: IPOs) although the Belgrade Stock Exchange (abbreviation: BSE) was restored in the last decade of the XX century. Even some neighboring countries realized IPOs successfully (e.g. the government of the Republic of Croatia conducted IPO of their Telekom in 2007 through the sale of 32.5% of shares on stock exchange, while 25% of shares were offered by preferred price to citizens) leaving Serbia at the bottom of the list when we are considering the capital market development. Compared to Croatia's experience in IPOs, in 2006 we had the acquisition of Telekom Srpska, where Telekom Srbija was the leading company in financing. The final decision in that process was not IPO of Telekom Srpska, funding was already realized through commercial loans. After several years, the possibility of Telekom's IPO emerged again, but the budget deficit problems and the absence of political will in the process led to another missed chance.

IPOs could bring a lot of positive changes such as the introduction of new financial instruments on capital markets. Observing the financial markets of developed countries, Serbian financial market could be assessed as less developed. It is characterized by the absence of institutional investors and the existence of fewer financial instruments, i.e. tighter options among several investment alternatives. The transition period in Serbia has lasted for too long, so inevitable changes were not realized as it is necessary bearing in mind the basic principles of open market economy. Furthermore, investment banking is not developed in Serbia, while commercial banks are focused on traditional banking, where the vast majority of assets are loans (about 60% of the total assets) disbursed to corporate and retail customers. The mentioned structure implies that commercial banking is more attractive and more developed than investment banking in Serbia. Insufficient level of development in terms of financial instruments available on the Serbian capital market and unawareness of potential investors regarding investment opportunities combined influenced the poor deployment of the capital market.

1. REVIEW OF CAPITAL MARKETS DEVELOPMENT IN SERBIA

Analyzing the available opportunities for investment on BSE, it is important to take insight into BSE's listings (see Fig. 1), such as:

1. Prime listing – contains only the major companies in Serbia, whose shares are actively traded. There are four shares listed on Prime Listing: Aerodrom Nikola Tesla (ticker:

AERO), Energoprojekt holding (ticker: ENHL), NIS (ticker: NIIS) and Sojaprotein (ticker: SJPT). Also, on Prime Listing are listed bonds issued by two different issuers: Republic of Serbia (74 bonds in total) and EBRD (1 bond with ticker EBRD01, included on BSE since December 13, 2016).

2. Standard listing – contains shares of three companies: Jedinstvo Sevojno (ticker: JESV), Komercijalna banka (ticker: KMBN) and Metalac (ticker: MTLC).
3. SMart listing – include only shares and deposit receipts on shares, with additional terms such as: minimum equity amount of issuer no less than 1 million EUR and minimum free-float of shares set at 25% of total outstanding shares (Belgrade Stock Exchange, 2016).
4. Open market – consisting of shares of 28 companies.
5. Multilateral trading platform (MTP) – the largest number of listed securities is on MTP segment, but those securities are not liquid. The total amount of listed shares is 642 (the number of issuers is 630), while there are also issued municipal bonds – namely two of them: Grad Šabac (ticker: SABC01) and Opština Stara Pazova (ticker: STPZ01).

Fig. 1 Market organization of BSE
Source: Adapted from Belgrade Stock Exchange (2017)

It is evident that the domestic capital market did not succeed in developing itself in compliance with the rules of open market economy. Several reasons could explain the described deficiency, but the most common factor is the absence of political will to make the transition on the market economy principles. The legislative framework was not detached from political will, while due to the same reason potential impulse impersonated in public companies listing on BSE was rare. It further ruined all necessary assumptions for the development of a modern stock exchange and slowed the transition process. Nevertheless, the recovery process of BSE started with simultaneous development of 2 types of instruments: debt and equity financial instruments.

Debt financial instruments were the first financial instruments of high-quality listed on BSE. These were the so-called "old savings bonds" that originated due to the fact that Serbian government recognized the debt of state-owned banks regarding savings in foreign currency and for that purpose government issued bonds with maturity dates at each year as the end of May till 2016 (see Table 1). The notional value of issued bonds was 4.2 billion EUR and trading with this kind of debt instrument was planned to be very

attractive (Miladinovski, 2012). In that sense, those bonds were excluded from tax burden, whilst they could be used before final maturity date under national amount for several purposes such as: the purchase of company's shares in the privatization process, the purchase of commercial and residential real estates, tax payments etc. Old savings bonds have a great role in Serbia as an instrument which brings back the confidence in the financial system and especially banks (see Fig. 2 and Fig. 3).

Table 1 Volume of converted savings deposits into bonds and OTC trading by series

Description	ISIN	Ticker	Volume of conversion (EUR)	OTC trading (EUR)
Bonds RS - Series A 2002	RSMFRSD60544	ARS2002	111.497.645	85
Bonds RS - Series A 2003	RSMFRSD38805	ARS2003	186.740.761	20.993.227
Bonds RS - Series A 2004	RSMFRSD62078	ARS2004	202.953.790	64.915.906
Bonds RS - Series A 2005	RSMFRSD64033	ARS2005	235.726.271	111.950.667
Bonds RS - Series A 2006	RSMFRSD40710	ARS2006	223.426.994	126.107.585
Bonds RS - Series A 2007	RSMFRSD60130	ARS2007	219.128.818	236.635.102
Bonds RS - Series A 2008	RSMFRSD60916	ARS2008	220.665.329	284.166.493
Bonds RS - Series A 2009	RSMFRSD31842	ARS2009	226.933.716	395.557.068
Bonds RS - Series A 2010	RSMFRSD14186	ARS2010	237.065.229	426.764.602
Bonds RS - Series A 2011	RSMFRSD18757	ARS2011	250.814.038	430.060.067
Bonds RS - Series A 2012	RSMFRSD93024	ARS2012	267.212.214	501.457.246
Bonds RS - Series A 2013	RSMFRSD68018	ARS2013	287.331.015	636.627.469
Bonds RS - Series A 2014	RSMFRSD73810	ARS2014	310.896.705	672.987.063
Bonds RS - Series A 2015	RSMFRSD79726	ARS2015	334.311.938	778.643.898
Bonds RS - Series A 2016	RSMFRSD70279	ARS2016	349.472.127	1.098.350.081
		Total:	3.664.176.590	5.785.216.559

Source: Authors based on data from Central Securities Depositary and Clearing House

Fig. 2 Conversion of saving deposits into bonds from August 2002 till July 2017
Source: Central Securities Depositary and Clearing House

Fig. 3 OTC trading from August 2002 till July 2017
Source: Central Securities Depositary and Clearing House

With the emergence of the global financial crises, in 2009 the government of the Republic of Serbia issued government Treasury bills and bonds. Unfortunately, the strategy for debt market development did not give any tangible results, so those securities were not traded frequently and based on market principles (already through direct contract with a known counterparty), while securities of municipalities and cities were not affirmed yet. A similar epilogue was noticed for corporate bonds, due to the fact that with the crisis emerging there was issue of short-term debt securities of over-indebted companies with relatively high, unsustainable interest rates. Government securities are financial instruments denominated in domestic or in foreign currency, issued by the government or competent ministry and registered in electronic form in the Central Securities Depositary and Clearing House - CSD (RS, Ministarstvo finansija, Uprava za javni dug, 2013). Short-term government securities are those with maturity up to one year, while long-term securities have maturity longer than one year. Domestic and foreign legal and physical entities could buy long-term government securities via authorized market participants (such as: banks and brokerages), whilst solely domestic legal and physical entities could buy short-term government securities. The rating of bonds is based on the financial stability of the issuer and it is a crucial indicator of bond's riskiness. "Credit rating is a forward-looking opinion about credit risk and an assessment of the ability and willingness of an issuer to meet its financial obligations in full and on time" (National bank of Serbia, 2017). The major rating agencies in the financial market are: Standard & Poor's (S&P), Moody's Investors Service (Moody's) and

Table 2 Investment grades per 3 major credit rating agencies

Moody's	S&P	Fitch
Aaa	AA	AA
Aa1	AA+	AA+
Aa2	AA	AA
Aa3	AA-	AA-
A1	A+	A+
A2	A	A
A3	A-	A-
Baa1	BBB+	BBB+
Baa2	BBB	BBB
Baa3	BBB-	BBB-
Ba1	BB+	BB+
Ba2	BB	BB
Ba3	BB-	BB-
B1	B+	B+
B2	B	B
B3	B-	B-

Source: QuadCapital Advisors (2017)

Fitch Ratings (Fitch) (see Table 2). Credit rating agencies usually express ratings as letter grades (A, B, C, D) where "AAA" is assigned as the best and "D" as the worst.

Rating agencies also provide outlooks that indicate the potential direction of rating in the future, which could be: positive, negative, stable and developing. Positive outlook means that a rating may be raised. Negative outlook means that a rating may be lowered and stable means that it is not likely to change. Furthermore, credit ratings of a certain country affect the credit ratings of other issuers headquartered in the same country. Table 3 presents the most recent credit rating development for the Republic of Serbia.

Table 3 Sovereign credit rating - Republic of Serbia

	Standard and Poor's	Fitch Ratings	Moody's Investors Service
Rating	BB- / positive outlook	BB- / stable outlook	Ba3 / stable outlook
Date	16 June 2017	16 June 2017	17 March 2017
Activity	Rating affirmed	Rating affirmed	Rating upgraded

Source: National bank of Serbia

Table 4 and Table 5 present the most recent trends in government securities taking into account the type of holder and currency in which securities are denominated in the period between the end of December 2015 and the end of June 2017. The balance of government securities denominated in EUR has an increasing trend in the observed period, with residents as the dominant type of holder (ranging between 94% and 98%). Also, considering the total amount of government securities denominated in EUR, the largest portion of holdings belongs to banks operating in Serbia (ranging between 61% and 69%). Considering only the population of residents (which includes the banks in Serbia), then the share of banks in government securities denominated in EUR is between 62% and 73%. If we separate the whole banking sector in Serbia per ownership structure, the results are as follows:

- foreign banks have a share between 49% and 51%;
- state-owned banks have a portion ranging from 43% to 47%; and
- private banks have a minority share which ranges from 4% to 6% at maximum.

Table 4 Government securities by type of holder (residents/non-residents) in Serbia

Periods	31.12.2015				31.12.2016				30.6.2017			
Type of holder	EUR	%	RSD	%	EUR	%	RSD	%	EUR	%	RSD	%
Non-residents	156,947,722	6%	261,502,340,000	39%	95,880,000	3%	202,698,910,000	39%	57,329,872	2%	186,076,740,000	29%
Residents	2,682,187,706	94%	407,435,810,000	61%	2,980,519,727	97%	453,544,740,000	61%	3,220,518,725	98%	455,523,300,000	71%
Total	**2,839,135,428**	**100%**	**668,938,150,000**	**100%**	**3,076,399,727**	**100%**	**656,243,650,000**	**100%**	**3,277,848,597**	**100%**	**641,600,040,000**	**100%**

Source: Central Securities Depositary and Clearing House Database (2017)

Table 5 Ownership structure of government securities holders in Serbian banking sector

Periods	31.12.2015		31.12.2016		30.6.2017	
Ownership structure	EUR	RSD	EUR	RSD	EUR	RSD
Foreign banks	972,749,000	257,532,970,000	987,832,000	251,825,910,000	980,399,000	252,449,660,000
State-owned banks	913,440,000	81,130,590,000	817,702,000	86,709,370,000	920,629,000	71,780,590,000
Private banks	76,874,000	26,093,000,000	113,977,000	27,100,000,000	111,256,000	31,550,600,000
Total	**1,963,063,000**	**364,756,560,000**	**1,919,511,000**	**365,635,280,000**	**2,012,284,000**	**355,780,850,000**

Source: Central Securities Depositary and Clearing House (2017)

On the other hand, the balance of government securities denominated in domestic currency (RSD) has a decreasing trend, again with residents as the dominant type of shareholders ranging

from 61% to 71%. By segregating the total amount of government securities denominated in RSD per banks which operate in Serbia, we concluded that banks are recognized as holders in 55% (minimum) or 56% (maximum) cases. Within the category of residents separately observed, the portion of banks in government securities denominated in RSD is between 78% (as minimum at the end of June 2017) and 90% (as maximum at the end of December 2015). Classifying all banks according to their ownership structure, the movements regarding balance of government securities are as follows: foreign banks have a portion ranging from 69% to 71%; state-owned banks have a share ranging from 20% to 24%; while private banks have the smallest share ranging from 7% to 9% as the maximum.

As the debt market (especially the bond market) in Serbia was not developed as it could be, in same way sharing the destiny of the overall capital market, the crucial question which arises is: What could be the potential impulse for debt market development in the prospective period and how could it be realized? Bearing in mind that the absence of IPOs and relatively small number of high-quality shares on BSE diminish the potential of equity market in Serbia, it is reasonable to initiate the question of debt market upgrade especially when all series of old savings bonds have already matured. Short-term and long-term bonds have some kind of important role, but the expected scope of development in this area was not reached. All above mentioned indicated that the revival of the debt market could be found in some new impulse, new product that is already known and established in the developed market economies. Such product are covered (or guaranteed) bonds which occupy the central part of this paper.

2. COVERED BONDS AS A NEW PRODUCT

Covered bonds are the type of corporate bonds with fixed return (slightly higher than the return of government bonds), where credit risk stays recorded into bank's balance sheet (the so-called "on-balance securitization"). The main characteristic of this bond is twofold collateralization for investors. Namely, the investor in covered bonds has collateral in the equity of issuer (financial institution or bank) on one side, or in priority right over cash flow derived from loan that was the basis for issuance of covered bond (in case of issuer bankruptcy). The investor in covered bonds is exposed to credit risk of the issuer. Although, observed historically, those bonds have existed for more than two and a half centuries, finally in the XXI century covered bonds became an irreplaceable and fast-growing segment of capital markets. Covered bonds were developed very intensively at the end of the XVIII and the beginning of the XIX century in Prussia, Denmark, Poland and France.

The turning point in the development of covered bonds is related to 1995 and issuing of German benchmark Jumbo Pfandbriefe bonds primarily aimed at providing liquidity for the public sector and response to investor's needs (Jonathan, 2006). The Pfandbriefe Act is a legal act, which serves to satisfy the demand of investors for a secure investment. Pfandbriefe provides issuers with a very cheap and reliable source of funding. This in turn enables the issuers to supply the credit market with loans on a continuous basis at prices that take their bearings from the capital market (Verband Deutscher Pfandbriefbanken, 2011). After the introduction of euro as the unique currency and general fall of interest rates, banks were motivated to revitalize the covered bond system for the purpose of competitive capital market creation. Rapid growth of covered bonds market within the European Union

(hereinafter: EU) was confirmed through development over recent years - average growth rate of 7.5% since 2007. In 2015, outstanding volume of covered bonds was on extraordinary level of 2.5 trillion EUR with 314 active issuers and 434 programs in 30 countries in and outside the EU (European Banking Authority, 2016). Simultaneously, most of the countries are working on improvement and harmonization of legislation in the segment of covered bonds.

In the absence of a unique definition of the "covered bonds" term, there are 4 preconditions which securities must fulfill in order to be considered as covered bonds. Those preconditions are (European Central Bank, 2008):

1) the issuer should be the credit institution which is the subject of supervision and regulation by competent authorities;
2) investors in covered bonds should have privileged position in comparison with other creditors in the case of issuer's bankruptcy;
3) the issuer of covered bonds is obliged to continuously maintain sufficient coverage in the pool of collaterals for fulfilling obligations toward investors at each point of time; and
4) the obligations of issuers are monitored by a qualified public body or other independent body.

The above mentioned preconditions (which are simultaneously characteristics) of covered bonds should be regulated by "special" or general legislative acts. In most countries, the covered bond system is regulated by "a lex specialis", while in the minority of cases this area is the subject of regulation by general legislative framework. In that sense, covered bonds could be divided into: regulated and structured covered bonds. Regulated covered bonds are those whose main attributes are regulated by "a lex specialis" or certain secondary legislative acts. Structured covered bonds imitate regulated covered bonds by their attributes, but they are not regulated by "a lex specialis", but by general laws on contracts and financial activities. Covered bonds could be compatible or not compatible with the EU Directives. In other words, it does not mean that all regulated covered bonds are at the same time compatible with the EU Directives due to the fact that regulation itself is not the only and sufficient requirement for compatibility evaluation. Adjustment to the Basel standards and requirements by banks put upon demand detailed analysis and treatment of covered bonds. It is necessary to include covered bonds into numerator of LCR ratio (as a part of highly liquid assets) respecting differences in interpretation of conditions given by the Basel Committee and the European Banking Authority on one side and the European Commission on the other.

According to interpretation of the European Commission, covered bonds have extraordinary liquid performances and certain covered bonds could be qualified into the segment of liquid assets of the first level for LCR ratio if they fulfill the following provisions: credit rating at 1 given by an external credit rating agency; minimum issue volume of 500 million EUR and full coverage of bonds pool with additional coverage over the full amount for minimum 2%. If listed conditions are satisfied then a haircut at the amount of 7% of the market value will be applied to those covered bonds. Other covered bonds which have: credit rating 2 given by an external credit rating agency (or assigned risk weighted factor of 20% in case that the rating is not available); minimum issue volume of 250 million EUR and full coverage of bonds pool with additional coverage over the full amount for minimum 7%; will be treated as liquid assets of the second level. A haircut factor set at 15% of the market value of covered bonds will be implemented on those assets (Bank for international settlements, 2013).

3. COVERED BONDS MARKET IN THE EU AND OTHER COUNTRIES

The development of the covered bonds market within the EU is owed to the EU Directives to a great extent and the main directives that arrange covered bonds market are:

- Directive 2009/65/EC on undertakings for collective investment in transferable securities (abbreviation: UCITS) which define concentration limit in terms of investment possibility in a certain security, with constraint that individual limit of 5% could be increased to 25% in case of investments in covered bonds (Directive 2009/65/EC of the European Parliament and of the Council (2009);
- 2006/48/EC and 2006/49/EC (that together represent CRD Directive – *Directive on Capital requirements*) for the purpose of prescribing rules about calculation of credit risk capital requirements for investments in covered bonds (Directive 2013/36/EU of the European Parliament and of the Council, 2013).

In the structure of covered bonds issuers within the EU countries there are:

- Universal credit institutions – with diversified business operations;
- Specialized credit institutions – focused on just one type of lending (for example: mortgage lending);
- Credit institutions that realize issuance via their entities founded just for those special business needs (the so-called "special purpose vehicle" or SPV).

The European bank for reconstruction (hereinafter: EBRD) is also very active on the covered bonds market development taking into account all potential benefits from a prospective growth of this market. EBRD made some analysis regarding current phase of covered bonds development in some Central and Eastern Europe countries, such as: Poland, Slovakia, Turkey, Croatia, Romania and Lithuania.

For a long time Poland did not succeed in the covered bonds development, although satisfactory preconditions existed. The main reason for failure was obsoleted legislative framework and structured model of covered bonds, where solely mortgage banks were authorized for issuance of covered bonds. In order to overcome these deficiencies, the creation of new legal and regulatory framework in Poland was defined, which should enforce the issuance of covered bonds and usage of more favorable market conditions. In July 2015, the amendments on legal acts for covered bonds were adopted in Poland which were put into force starting from January 1, 2016. Covered bonds in Poland are in compliance with the main provisions of the UCITS Directive as well as Credit Risk Regulation (CRR). At the end of June 2017, EBRD invested 12 million EUR in local currency (zloty)-denominated covered bond issue by PKO Bank Hipoteczny S.A. (abbreviation: PKO BH). It was fixed rate covered bond issuance of PKO BH, backed by Polish-Zloty-denominated residential mortgage loans and with a provisional rating of Aa3 assigned by Moody's credit rating agency. PKO BH is one of three mortgage banks operating in Poland (subsidiary of PKO Bank Polski, the largest commercial bank in Poland) and specializes in zloty-denominated residential mortgages (Reiserer, 2017a).

In Croatia, covered bonds are not clearly defined and regulated by the law, although there are obvious expectations from market participants to be involved in the process of issuance or/and investing in covered bonds. Those expectations motivated the Government of the Republic of Croatia to bring the Law on covered bonds which will overcome deficiencies of the local market and establish a minimum of standards with clearly defined eligibility criteria that are already known and regulated through CRR (Moraru, Kubas & Istuk, 2016).

At the beginning of 2017, as a result of partnership relations between EBRD and Ministry of Finance, EBRD rolled out 200 million EUR framework for mortgage covered bonds in Slovakia with the aim of strengthening the development of the local capital market. In the first project under the program, the EBRD invested 49 million EUR in a series of 7-year mortgage covered bonds issued by the Všeobecná úverová banka (VUB), the second largest universal bank in the Slovak Republic by total assets. The notional amount of the issuance was 250 million, the largest so far on the Slovak market (Reiserer, 2017b).

Starting in 2010, action for the issuance of covered bonds were undertaken in Romania. The law on covered bonds issuing came into force in March 2016. The issuances of bonds guaranteed with real estate claims contribute to the expansion of the maturity of liabilities, therefore allowing banks to have an adequate balance in their portfolios of assets with longer maturities. Romania is in an atypical situation, being among the few EU states still not benefiting from such issuances, although the balance of mortgage loans of over 11.2 billion EUR is enough to start issuing covered bonds, this value being higher than the values found in the portfolios of the states in the region where such operations have already started (Romanian Association of Banks, 2017).

Undoubtedly, similar activities are necessary in Serbia in order to create incentives and favorable circumstances for the revival of the debt market. It means that legal acts, incorporated in the EU countries and some neighboring countries (such as: Croatia), should define provisions which will cover the covered bonds regulation and should be put into force in the manner that creates prerequisites for primary issuance and active trading on secondary market with those bonds. For the realization of the above mentioned, a cost-benefit analysis should be made regarding inclusion of covered bonds on market, having in mind all specifics of the domestic financial sector and missed opportunities in the past to lift the financial market onto a higher level of development. The legislative framework should be created carefully in order to cover all important provisions, especially the provision related to investor's protection. Protection of investors in covered bonds is one of the key advantages, so the legislation should provide it in two contexts:

1) Maintenance of payment dynamic and tenor of bonds in compliance with initially contracted terms; and
2) Investors should keep their priority position in relation to other (uninsured) creditors of bank.

Analyzing data in and outside the EU, there were significant changes in investors' base and their preferences. Central banks as investors increased their share by almost 4 times from 8.9% in 2009 to 30.09% in 2015. Oppositely, asset managers, insurance companies and pension funds implemented exit strategy from the market: lowering their share from 50.6% in 2009 to 31.9% in 2015, focusing on other investment alternatives with similar yields (see Fig. 4). Banks had a stable share in the observed years, meaning that their demand for covered bonds is highly motivated by LCR (liquidity coverage ratio) requirements and eligibility criteria for LCR according to the Basel III standards (Mirković, 2015).

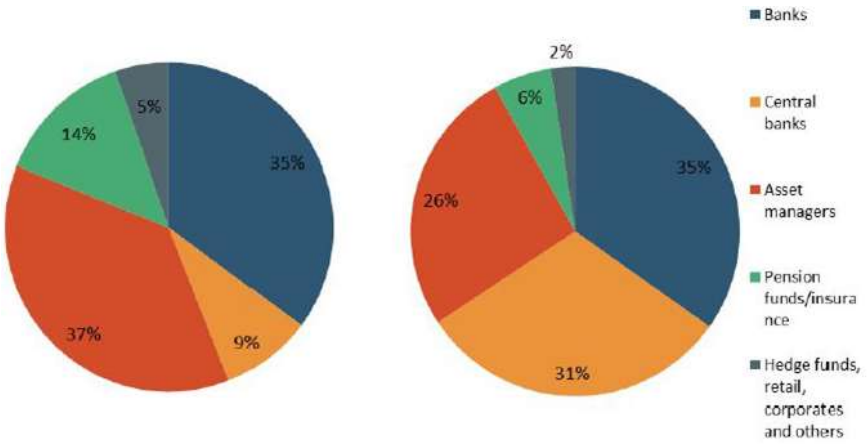

Fig. 4 Allocation of euro benchmark covered bonds by investor type (2009 & 2015)
Source: European Banking Authority (2016). EBA report on covered bonds, recommendations on harmonisation of covered bond frameworks in the EU

More cautious investors usually have on their mind the main shortcomings that are linked with covered bonds as institute of debt market. The main risks of investing in covered bonds are (Božović, 2016):

1) Credit risk – in case when issuers cannot make their contractual payments partially or fully (when bankruptcy proceedings emerge);
2) Interest rate risk – inherent for all types of banking products with a fixed interest rate. The changes of interest rates on the market have a reverse impact on the price of bonds: with an increase of interest rates on the market, the price of bonds declines and vice versa;
3) Reinvestment risk – correlated with interest rate risk which occurs at long-term coupon bonds. The increase of interest rates diminishes the value of bonds bought with initial investment;
4) Recall risk – inherent to bonds with the recall option;
5) Inflation risk – as a probability that an unexpected inflation change will occur. In that moment, all investors lose interest revenue, while if the inflation rate exceeds the coupon rate, all investors have capital losses.

Banks are focused on the issuance of covered bonds in order to provide liquidity sources, so it is very likely that banks will decide to issue covered bonds when they have a low rate of return and a high loan-to-deposit ratio. After the issuance of covered bonds, the rate of return is growing while loan-to-deposit ratio is declining. Covered bonds could have an extraordinary positive impact on the financial markets development, because they are bearing alternative, consistent, sustainable, relatively cheap and available source of funding. Investments in covered bonds represent an alternative instrument, but are simultaneously characterized by great quality and stability, which is very important especially in the situation of instability on the financial market. In order to make incentives for further development of the covered bonds market, it is necessary to achieve consensus among banks in terms of their interest to show up as investors in those securities and after that to become active players in trading activities.

The models of covered bonds which are already implemented in the EU countries could serve as a solid ground and a lesson on which to raise the prospective growth of the covered bonds market in Serbia. A different view states that it is not realistic to expect that the emergence of covered bonds as a new debt instrument would change rapidly the relations in the structure of market participants on the Serbian financial market. Similarly, due to the fact that the Serbian financial system is bankocentric (with banks as the major players covering more than 90% of the whole financial market) banks are solely "responsible" for the future development of this debt instrument. Banks as issuers are very interested in covered bonds. The interests of banks in covered bonds are additionally supported by the significance which covered bonds have for LCR ratio calculation which is a part of the Basel III regulation. The above mentioned could be realized only if adequate legislation exists to establish precise roles and responsibilities of all market participants and in final instance create assumptions for foreign direct investor's entrance on the covered bond market (Radević & Lekpek, 2014). Having in mind the sensitivity of this matter and insufficient domestic practice, it is necessary to create special legislation which will cover the subject of covered bonds (lex specialis) as it has already been done in several countries with greater experience in handling and treatment of covered bonds on the debt securities market.

CONCLUSION

Some neighboring countries successfully conducted IPOs and in that way enriched the existing offer on their capital markets. At the same time due to a wide variety of instruments on capital markets, those countries became very attractive for foreign investors. Unfortunately, that was not the case in Serbia. It is specially indicated that several years after the Law on the Right to Free Shares to citizens of Serbia entered into force, there was the absence of IPOs, but also the absence of launch of new debt securities issued by the government, other territory units and municipalities. The period of positive economic conjuncture, manifested into growing trend on BSE during the first half of the first decade of this century, was not fruitful for stock exchange development in terms of inclusion of large institutional investors. One of the reasons for that is, to a great extent, the delay in the process of passing the Law on investment funds in Serbia. The consequence of the delay in the legislative context were delayed activities of investment funds so they have only had an active role in Serbia since a declining trend on BSE was obvious in 2008.

The negative effect of delay in introducing the Law on investment funds is impersonated in inadequate development of financial market products, especially in the absence of sophisticated products. BSE was not recovered in full manner until today, simultaneously recording very modest daily turnovers in comparison with the potential that was expressed at the beginning of the XXI century. In more detail, the turnover on BSE is mostly defined by shares trading (trading of equity instruments) and it seems that additional effort is necessary in order to create a stimulating debt financial market. Bearing in mind the above mentioned, the issuing of covered bonds as a new, sophisticated product could be a great step towards a more efficient and effective debt market. Generally, it is very difficult to expect that the emergence of covered bonds would change dramatically the whole outlook of the Serbian financial market, but it could certainly enrich the offer and indicate the potential positive

movements in the prospective period. In case that the option of covered bonds introduction and implementation in Serbia prevails, then the crucial point would be to acquaint investors with the main advantages and disadvantages of covered bonds. In that way, it would be possible to create a stimulating ambience for further development of the capital market and increasing credibility of foreign direct investors into the Serbian financial system.

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POKRIVENE OBVEZNICE: NOVA ŠANSA ZA OPORAVAK TRŽIŠTA KAPITALA U SRBIJI

Početkom XXI veka Srbija je otpočela proces tranzicije ka otvorenoj tržišnoj ekonomiji. Jedan od segmenata koji je trebalo razviti u skladu sa principima tržišne ekonomije jesu finansijska tržišta, tačnije tržište kapitala. Oporavak Beogradske berze i rastući trend u prvoj polovini XXI veka su dali optimizam po pitanju budućeg razvoja srpskog tržišta kapitala. Nažalost, tržište kapitala u Srbiji nije napravilo očekivani napredak. U radu je sprovedena analiza stanja na Beogradskoj berzi, trgovanja vlasničkim i dužničkim instrumentima, uz identifikovanje nedostataka koji su doveli do nedovoljnog nivoa razvijenosti srpskog tržišta kapitala. Kako su mnoge šanse za rast propuštene i tržište kapitala stagnira nekoliko godina unazad, u radu je istaknuto da postoje novi, sofisticirani proizvodi koji mogu dati impuls daljem razvoj finansijskih tržišta. Primer takvih proizvoda su pokrivene obveznice, vrsta dužničkih instrumenata koji se široko primenjuju u Evropskoj Uniji. U radu se iznose osnovne karakteristike ovog proizvoda zajedno sa iskustvima drugih zemalja koja mogu biti vrlo korisna za Srbiju.

Ključne reči: *pokrivene obveznice, dužnički instrumenti, tržište kapitala, inicijalne javne ponude, kreditne rejting agencije*

CIP - Каталогизација у публикацији
Народна библиотека Србије, Београд

33+007

FACTA Universitatis. Series, Economics and Organization / editor in chief Dejan Spasić. - Vol. 1, No 1 (1993)- . - Niš : University of Niš, 1993- (Niš : Unigraf-x-copy). - 24 cm

Tromesečno. - Tekst na engl. jeziku. - Drugo izdanje na drugom medijumu: Facta Universitatis. Series: Economics and Organization (Online) = ISSN 2406-050X
ISSN 0354-4699 = Facta Universitatis. Series: Economics and Organization
COBISS.SR-ID 87230727

FACTA UNIVERSITATIS

Series
Economics and Organization

Vol. 14, N° 4, 2017

Contents