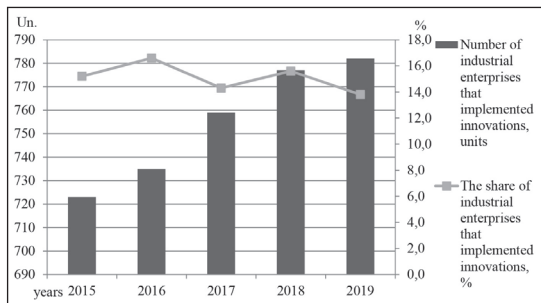


Časopis za ekonomiju i tržišne komunikacije

Economy and Market Communication Review



Dynamics of the number of industrial enterprises that implemented innovations and their share in 2015-2019

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Časopis za ekonomiju *i tržišne komunikacije*

Economy and Market *Communication Review*

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FEMALE BODY IN MEDIA AND MARKETING

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Abstract: *This research aims to examine the attitude towards the ways in which the female body is represented, i.e. to determine the extent to which the respondents (women) agree with the statements based on critical observations of feminist and researchers on gender issues on unethical (unacceptable) representation and treatment of woman and the female body in media and marketing. The study involved 509 women, aged between 18 and 55 years. The attitude towards the representation of the female body is operationalized by a scale (RFB scale) of 21 statements, grouped into three dimensions- sexual objectification, promotion of the “ideal” female body and instrumentalization of the female body. The results show that the respondents, although to varying degrees, agree with all the statements that describe the ways in which the female body is presented in the media and in marketing. Although all three dimensions are quite common in the media and in marketing, the respondents see the instrumentalization (abuse) of the female body for commercial purposes as the most pronounced phenomenon. Both on an overall scale and in dimensions, women from urban areas show a higher score than women living in rural areas. There are no statistically significant differences between groups defined by other sociodemographic characteristics (age, marital status, region, type of neighborhood, education). The conclusion is that the respondents support the attitude of feminists and researchers of gender issues that in the media and in marketing there is sexual objectification and promotion of the “ideal” female body, and especially pronounced instrumentalization (abuse) of women and the female body for commercial purposes.*

Key words: media; marketing; sexual objectification; “ideal” female body; instrumentalization of female body.

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INTRODUCTION

The media has a significant impact on the development and shaping of social and cultural norms related to women and media representation, as a process by which meanings are produced and exchanged within a culture, greatly influences the prevailing notions about them. The media image of a woman is a product of a social norm about what she is and what she can be. Therefore, she is expected to accept that image and to act in accordance with it. The media forms interpretive frameworks in which messages are easier to interpret and understand. Simplification is inevitable, “very easily instead of ‘types’ they offer ‘stereotypes’, instead of affirming diversity they produce simplified and uncritical notions of ‘otherness’ ”(Milivojević, 2004, pp. 12-13). By using “cultural patterns, the media carefully cultivates desirable notions of gender identities and roles” (Milivojević, 2004, p. 13).

Widespread, uncritically accepted, self-evident opinions about the roles and position that women and men should have in society are at the core of gender stereotypes. They are imposed, both through the public sphere (media, politics, art, economy), and through the private sphere, “by nurturing in the family and emotional conditioning by accepting certain gender roles and gender regimes” (Jarić & Radović, 2011, p. 155).

Gender stereotypes successfully sustain the notion of ‘male’ and ‘female’ and their roles, even when they are difficult to recognize in reality. In the process of representing women, family and sexual functions come to the fore: a woman usually presents herself as a mother, housewife, and wife, emphasizes her beauty and physical appearance and reduces her to a sexual object - a means of satisfying the sexual needs of others.

“What dominates the reporting is the idealized image of femininity: young, beautiful, white, heterosexual, rich... where double discrimination can be observed: physical perfection (which is not required of men) and the creation of an unrealistic image of female value; the second is the representation of the woman as an object for the stimulation of men. At the same time, the message to women is to look as beautiful and desirable as possible in order to please men” (Anđelković, 2009, p. 12).

A woman in the media, despite the possibility of diverse representation, remains in the domain of character, body and sexuality - the external appearance, “typically female” features and “anatomical mission” stand out. Recognizing the chance to make money, industry (marketing, media, fashion, cosmetics ...), not only uses stereotyping and vulgarization of women and female sexuality, but also actively participates in creating standards of beauty and appearance of the female body, which are usually unrealistic and unattainable. Positioned to constantly observe and evaluate her own body, a woman is forced to evaluate herself on the basis of appearance, sexual qualities and abilities. Starting from the mentioned problem, the focus of this paper is the treatment, representation and abuse of women and the female body, i.e. the exploitation (abuse) of the female body and sexuality for commercial purposes and the maintenance of her position in society.

Sexual Objectification of Woman

Placed in sections for fun and relaxation, a woman presents herself within the boundaries of her body, eroticized and objectified, and female sexuality is projected through typically male, heterosexual fantasies, because it should give pleasure to a man (Višnjić & Miroslavljević, 2012). Sexual objectification is a central notion of contempo-

rary feminist theory, and is associated with Catherine McKinnon and Andrea Dworkin, anti-pornographic feminists. They cite pornography as an essential form of objectification of women, in which a woman becomes a sexual object, always available to men (Dworkin & McKinnon, 1988). They place objectification in the context of the gender environment and understand it as a powerful manifestation of wider gender inequality - an objectified woman serves to satisfy the sexual needs of men (Papadaki, 2012).

Bartky argues that sexual objectification also occurs when a woman's body or body parts are separated from her as a person and a woman is viewed primarily as a physical object of male sexual desire (Bartky, 1990). "When we define a woman exclusively by her body (which, for example, is fashion photography, advertising and propaganda material, etc.), we simultaneously take away her face, which is a symbol of diversity and subjectivity" (Višnjić & Mirosavljević, 2012, p. 250).

The theory of objectification puts the female body in a sociocultural context - through all forms of sexual objectification the experience of people being treated as a body, as a set of body parts, and valued primarily according to how others can use them. Sexual objectification is quite widespread in interpersonal relationships (at work, among friends, acquaintances, on the street, etc.), as well as in the media sphere - TV programs, commercials, Internet content, magazines.

The first psychological consequence of sexual objectification is self-objectification. In a culture that objectifies women, both women and girls learn to treat themselves as objects that are viewed and evaluated, that is, the observer's perspective is internalized (Fredrickson & Roberts, 1997). Self-objectification is the primary psychological mechanism that explains the connection between women's experiences of sexual objectification on a cultural level and their physical and subjective well-being on an individual level. It reflects a psychological strategy that allows women to anticipate and thus exercise some control over how others will view and treat them (Calogero, 2012).

Martha Nussbaum cites seven forms of objectification: 1. Instrumentality - The objectifier treats the object as a tool of his or her purposes; 2. Denial of autonomy - the objectifier treats the object as lacking in autonomy and self-determination; 3. Inertness - the objectifier treats the object as lacking in agency, and perhaps also in activity; 4. Fungibility - the objectifier treats the object as interchangeable (a) with other objects of the same type, and/or (b) with objects of other types; 5. Violability - the objectifier treats the object as lacking in boundary - 6. Integrity, as something that it is permissible to break up, smash, break into; 7. Ownership - the objectifier treats the object as something that is owned by another, can be bought or sold, etc; 8. Denial of subjectivity - the objectifier treats the object as something whose experience and feelings (if any) need not be taken into account (Nussbaum, 1995, p. 257). Rae Langton adds three more: 1. Reduction to body - the treatment of a person as identified with their body, or body parts; 2. Reduction to appearance - the treatment of a person primarily in terms of how they look, or how they appear to the senses; 3. Silencing - the treatment of a person as if they are silent, lacking the capacity to speak. (Langton, 2009, pp. 228-229)

Social Standards of Beauty

Social standards of beauty have changed throughout history, from the emphasis on female curves in the ancient world (Aphrodite / Venus) to the promotion of thin and slender female bodies, which dominate the modern public scene (thin ideal). What remains as a constant is the reduction of women to physical appearance: beauty is glorified, the

attributes of the female body are idealized, women are valued on the basis of physical appearance, while personality and integrity, women's experiences, education, values, life and professional successes, are put in the background, "remain in the shadow".

In modern (consumer) culture, attractive and desirable physical appearance implies unattainable standards of beauty. Under the influence of external pressure (from the media, marketing, fashion, etc.), women are forced to accept them and include them in their daily experiences. Society encourages expectations regarding the size and shape of a woman's body (women should be thinner and smaller than men), the way they move (women are limited in their movements – according to body size, take smaller steps and keep limbs closer to their bodies) and body decoration (women should be sexually attractive to men, and their faces should not show signs of exhaustion or deep thought). Women are forced to believe that if they discipline their bodies in this way, they will be respected by men (Bartky, 1990). According to Foucault, women actively discipline their bodies not only to avoid negative social consequences but also to achieve certain types of pleasure (Lennon, 2019). In Western culture, no part of a woman's body remains intact, unchanged, every feature of a woman's face, every part of her body is subject to change (Dworkin, 1974). The body is perceived as a project (Grogan, 2008), as something that is unfinished – needs to be refined to be good enough. Fitting into the prevailing ideal of beauty is equated with values such as happiness, contentment, healthy living and improved self-confidence, thus creating a "myth of beauty" (Wolf, 1990).

Abuse of the Female Body

Marketing / advertising is largely a reflection of the popular culture that created it, and its power is reflected both in the reflection of cultural attitudes and values, and in their shaping. The dominant attitudes, values, social norms, and myths it creates determine the behavior of many people it performs a function like a myth in ancient and primitive societies (Leymore, 1975).

Conceived as a natural sexual characteristic, beauty supports the myth of femininity which portrays gender identity as something fixed and stable. Modern industry recognizes female beauty as a phenomenon that can be earned, so in cooperation with the media they impose social discourse and the environment in which it is glorified in - they create a "commercial culture of beauty" (Grout, 2015). The imposed need for constant beautification leads to establishing links with media fantasies about femininity and an industry that offers the means to revive those fantasies. Women strive to look like media-generated icons (Grout, 2015), and beautification is becoming their daily practice. Products and services, which provide a beautiful and desirable look offered by the industry, marketing creates a message about their efficiency and necessity, and the mass media send it to their woman consumers.

Marketing experts in the permanent race to maintain an acquired or conquer a new market, often do not pay attention to respecting the code of ethics of advertising. This is justified by the slogan "the audience wants it". To achieve their ultimate goal - to attract and retain as many consumers of a product or user of a service, advertisers are becoming more reckless and aggressive in choosing means and methods.

Due to the general devaluation of ethical norms and human values, women are often abused for marketing purposes: they present themselves stereotypically, most often within a family (mother, housewife ...) or sexual function (sexual object, dec-

orative-sexual decor ...), and targeted showing parts of the female body is becoming common practice. The sexual content of the advertisement is one of the more effective methods of attracting the attention of the target (male) audience. With sexistly created advertising content, products and services are sold faster, easier and more, and higher quantities, thus profit grows. The general commercialization of sexual content and their pronounced presence in marketing have become an unavoidable trend. The sexual exploitation of the female body for commercial purposes is based on the race for profit – the print media market is dominated by the attitude that “nudity sells newspapers”, and the electronic media is of the opinion that “the bigger the cleavage and the shorter the skirt, the higher the viewership”. “Treating the female body as an object abolishes its own identity, and placing it in explicit poses and situations and reducing its functions only to instinctive and banal, is the way in which marketing will most often, very successfully, promote the product and attract audiences”(Lubina & Brkić Klimpak, 2014).

A Framework for the Ethical Representation of the Female Body

The women’s movement in the mid-1970s largely encouraged dissatisfaction with the representation of women in the media, because the prevailing notions of women largely depend on media representation (Milivojević, 2004). Activist and feminist theorist Betty Friedan pointed to the problem of “invisible but happy housewives” (Friedan, 2010), and Geye Tuchman to the inadequate treatment of women through the analysis of media content (Tuchman, 1978). Her study on the “symbolic annihilation of women” has inspired a wealth of research on the trivialization of women’s experience, the objectification of women, and the glamorization of women’s appearance (Milivojević & Matović, 2016).

Critical observations by feminists about the way women and the female body present themselves in the public / media sphere have met with a response first in Western society and later in other parts of the world. Declarations, recommendations, regulations have been adopted, both at the level of individual countries and at the level of international organizations (UN, EU, etc.), with the aim of serving as a framework for ethical representation of women and women in the media, marketing / advertising, etc., in a way that allows respect for the integrity, uniqueness and personality of women.

Creating a framework for the ethical representation of women and the female body in the media sphere, through the adoption of numerous documents by international organizations and domestic legislation, has led to a reduction in discrimination against women and acceptance of gender equality as a benefit for all. The new challenges that companies face (social, technological, etc.) force them to create new, sustainable marketing strategies, because they represent an important factor in their further development. “Adapting to new trends and challenges of modern business conditions responsible behavior of companies and their representatives in the market, so the acceptance of ethical, moral and business principles are increasingly pronounced” (Projović & Popović Šević, 2014).

The representation of women is dominated by gender stereotypes that arise from gender roles, i.e. traits that are attributed to men and women. Defined in a patriarchal

chal society, family and sexual function determine the framework and environment in which a woman and their body are represented. The value of the female body is becoming a priority for many industries (media, cosmetics, fashion,...), and the integrity, personality and needs of women are in the shadow of maintaining the gender regime and making a profit. The questions that naturally arise are: do women perceive, recognize the ways in which they present themselves in the media sphere, do they support the attitude of feminists to abuse their bodies and sexuality, are they aware of the manipulations used by the media and marketing to impose unattainable standards? beauties, models to strive for ...?

GOAL AND TASKS OF THE RESEARCH

The aim of this research is to examine the attitude towards the ways in which the female body is represented and treated in the media and marketing, i.e. to determine the extent to which respondents (women) agree with claims based on critical observations of feminists and researchers on gender issues, on unethical (unacceptable) representation, and treatment and abuse of the female body.

In accordance with the goal, specific research tasks are defined:

- To determine the degree of agreement of the respondents with the statements that make up the Scale of Attitudes towards the representation of the female body, i.e. with critical observations of the ways in which the female body is treated, represented and abused in the media and marketing;
- Determine the metric characteristics and factor structure of the RFB scale;
- Determine the degree of expression of the RFB scale factor;
- Identify differences in the responses of groups formed on the basis of socio-demographic characteristics (age, region, marital status, urban/rural areas, education).

METHODOLOGY

Sample

The study involved 509 women, aged between 18 and 50, from Serbia and Republika Srpska (BiH). 49.6% of the women are under the age of 25, and 50.4% over the age of 25. Of the total number of women surveyed, 61.5% were unmarried and 38.9% were married or living in a partnership. 16.1% are from rural areas and 83.9% from urban areas. Currently 44.6% are studying and 55.4% have completed schooling (8.3% high school and 47.1% college or postgraduate). 54.4% of respondents were from Vojvodina, 26.1% from Belgrade, 10.4% from Central Serbia, and 9.1% from Republika Srpska (BiH).

Instrument

The attitude towards the representation of the female body in the media and marketing was assessed with a scale of 21 statements, constructed in the form of a seven-point Likert-type scale, where number 1 means complete disagreement, and 7 means complete agreement with the given statement. Respondents expressed their agreement / disagreement with the statements based on critical observations, primarily feminists, and about the way women and the female body are presented in the media sphere, marketing, public space...

The scale consists of claims about sexual objectification (Velov & Zotović,

2020)), claims about social and media pressure to accept standards on the appearance of the female body, as well as claims about the instrumentalization of the female body. The higher score reflects the attitude of the respondents (women) that in the media and marketing the female body is represented in an inadequate and unacceptable way, that the integrity, dignity and personality of women are not respected, i.e. that a woman is reduced to physical appearance (beauty is glorified, female attributes are idealized bodies, a woman values on the basis of physical appearance) or a sexual object (sexually exploits and humiliates), and the female body is abused for commercial purposes.

Collection and Statistical Processing of the Data

Data collection was done electronically - an online questionnaire was created on Google Forms. After collecting the data, a database was created in the statistical program for social research SPSS 20 (Statistical Package for the Social Sciences).

Based on the Cronbach's alpha coefficient, the reliability of the scales were determined. The factor structure and constructive validity of the instrument were examined by applying exploratory factor analysis. The Principal components method was used for factor extraction, and the justification of the factor analysis was assessed using the Kaiser-Meyer-Olkin Measure of Sampling Adequacy and the Bartlett sphericity test. In determining the number of significant dimensions, the Kaiser-Guttman criterion of the unit, the Cattell's scree plot, as well as oblique rotation, Promax, were used.

The attitude towards the representation of the female body in media marketing is described by descriptive statistics (relative and absolute frequencies, measures of central tendency and measures of variability). Pearson's correlation coefficient (r) was used to express the correlation of the variables. Differences between groups defined by sociodemographic characteristics were tested by Independent-samples t test and Analysis of variance (ANOVA). Differences in respondents' responses on latent dimensions were tested by Paired-samples t test. The level of statistical significance was defined at $\alpha = 0.05$.

RESULTS

The Attitude towards the Representation of the Female Body

The use value of a measuring instrument depends on its metric characteristics, and for that purpose, statistical procedures are most often used, which enable insight into the stated characteristics. The Cronbach's alpha coefficient ($\alpha = 0.93$) indicates a high degree of reliability of the RFB scale, and the correlation coefficients of individual items with the total score (without the examined item) on its sensitivity, discriminatively – range between 0.43 and 0.70.

In order to examine the constructive validity and latent structure of the Scale of attitudes towards the representation of the female body (RFB Scale) in the media and marketing, a factor analysis was conducted. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy ($KMO = 0.937$) and the Bartlett's test of sphericity ($X^2_{210} = 4980.210$; $p < 0.001$) indicate that the application of factor analysis is justified. According to Cattell's scree plot and Kaiser-Guttman criterion of the unit, three main components were extracted, which together explain 54.80% of the total variance. They are named according to the content of the claims that make them up.

Table 1. Scale of attitudes towards the representation of the female body (RFB Scale) - mean (M), standard deviation (SD), factor loads

Sexual objectification	M (SD)	Factor loads
In the public/media sphere, it is common for a woman's body to be presented as a sexual object (a thing for sexual exploitation).	5.21(1.50)	0.82
The female body is presented in the public/media sphere in a way that provokes the male desire for possession.	5.19(1.41)	0.80
In public presentation, the decorative-sexual function of women and the female body is most often emphasized.	5.17(1.32)	0.79
The erotic content dominates when presenting the female body in the public/media sphere.	5.27(1.28)	0.77
In the media, a woman is mostly portrayed as a picture, she is given only a body, a "look".	5.03(1.42)	0.73
Targeted display of female body parts is a common practice of the media and advertising industry to attract the attention of potential users.	6.12(1.05)	0.66
The media space is dominated by images of naked or semi-naked female bodies followed by slogans that have a sexual connotation.	5.67(1.26)	0.65
In everyday life, women often present themselves as a desirable sexual object.	5.17(1.36)	0.50
Promotion of the "ideal" female body		
The image of the "ideal" female body is imposed by the media industry and consumer culture as an authority to which all women must aspire at all costs.	5.34(1.48)	0.72
The image of the "ideal" female body attracts (seduces) women as a perfect stereotype (model) to which they want to approach.	5.75(1.21)	0.72
The media image of the "ideal" female body influences a woman to become alienated from her body (to observe / criticize it as if it were someone else's).	5.56(1.43)	0.71
In the public representation of women and the female body, the personal identity is erased and the notion of the "ideal" woman is imposed.	5.55(1.39)	0.69
The media space is ruled by female bodies that we recognize as "fake" and unreal.	5.58(1.29)	0.68
The attractive and desirable physical appearance of the female body, which is imposed by the media, implies unattainable standards of beauty.	5.40(1.36)	0.67
The female bodies that dominate the media space are mostly flawless, which can rarely be found in "real life".	5.65(1.50)	0.66
Instrumentalization of the female body		
In modern consumer culture, the female body is seen as a thing that needs to be constantly beautified.	6.11(1.10)	0.79
The media image of the "ideal" female body serves as an instrument for making a profit in the fashion, cosmetics, pharmaceutical, fitness and other industries.	6.18(1.08)	0.76
In the media sphere (advertising), the female body is presented as a thing that can be changed at will.	5.53(1.33)	0.67
The female bodies that dominate the media space are extremely sexualized.	5.57(1.26)	0.66
The importance of physical appearance and the ideal of thinness is overemphasized in the representation of the female body in the media sphere.	6.04(1.11)	0.65
Women and their bodies in the media occupy the most colourful pages, intended for relaxation, entertainment, topics that belong to the private sphere of life.	5.33(1.31)	0.50

Source: authors

The first component, sexual objectification of the female body, covers 40.73% of the total variance. It contains 8 statements with a factor load from 0.50 to 0.82. The Cronbach's alpha coefficient for this dimension ($\alpha = 0.87$) indicates high reliability. It refers to the treatment of women as a sexual object. A woman presents herself within the boundaries of her body, eroticized and objectified, and female sexuality is projected through typically male, and heterosexual fantasies. The sexual and decorative function of women is emphasized, the erotic context dominates, and the male desire for possession is provoked. A woman becomes a thing for sexual exploitation, treated as a body / set of body parts, viewed as a sexual object. Most often placed in a subordinate position in relation to a man, eroticized and objectified, it is accompanied by sexist messages.

The second component is called the promotion of the "ideal" female body and explains 8.18% of the total variance. It consists of 7 statements with a factor load of 0.66 to 0.72. The Cronbach's alpha coefficient for this dimension is $\alpha = 0.84$. It refers to the promotion of imposed standards of beauty. In the representation of women and the female body, the importance of physical appearance is overemphasized, unreal and false bodies are shown, personal identity is erased and the notion of the "ideal" woman is imposed. There is media pressure on women to accept and incorporate promoted standards into their daily experiences. The female body is constituted as something to be admired, and women state that they judge their value on the basis of physical appearance. Fitting into the promoted ideal of beauty is seen as a means to achieve a happy, contented and healthy life - although it essentially influences a woman's alienation from her body (observes / criticizes).

The instrumentalization of the female body as the third component covers 5.88% of the total variance, and is composed of 6 statements - factor loads between 0.50 and 0.79. The Cronbach's alpha coefficient for the third dimension is $\alpha = 0.83$. It refers to the abuse / instrumentalization of the female body - it is used to make a profit, satisfy sexual desires and maintain the gender regime. The female body is constituted as a use value, its attributes are treated as purchasing benefits, which can be selectively enlarged, replaced or transformed. Extremely sexualized, the body is understood as a project, as something unfinished that must be worked on. It takes advantage of women's care for their own body and imposes the need for constant beautification. The woman and the woman's body are placed in sections intended for relaxation, entertainment, topics that belong to the private sphere of life, which according to established stereotypes belong to women, and public to men.

There is a high degree of association between the extracted components of the RFB scale. The second-order factor analysis confirmed the one-dimensionality of the RFB scale, which explains 77.06% of the total variance. The average score (total average score) for the Scale of attitudes towards the representation of the female body is $M = 5.54$; $SD = 0.83$.

Differences between composite scores on scale dimensions were tested by Paired-Samples t test, and the results showed that there are statistically significant differences - instrumentalization of the female body is in the lead compared to the other two dimensions, it is more represented in the media in marketing. Descriptive data for latent dimensions, Pearson's correlation coefficient (r) and t values are shown in Table 2.

Table 2. Descriptive data, correlations and differences in average scores on scale dimensions (t values)

Latent dimensions	M (SD)	Correlations (r)		t values	
		2	3	2	3
1) Sexual objectification	5.35(0.96)	0.62**	0.64**	-5.17**	-12.64**
2) Promotion of the "ideal" female body	5.55(0.98)		0.70**		-7.63**
3) Instrumentalization of the female body	5.80(0.88)				

Level of statistical significance: *p<0.05; **p<0.01.

Source: authors

Differences Based on Sociodemographic Characteristics of the Respondents

Using the Independent-Samples t test and Analysis of Variance (ANOVA), the differences in the responses of the respondents on the latent dimensions and the total score of the RFB scale depending on the socio - demographic characteristics: age, region, urban/rural areas, marital status and education were tested. The results showed that statistically significant differences exist only between respondents living in urban and rural areas. Respondents living in the city have a higher score both on the overall RFB scale and on its dimensions (Table 3). Differences between groups within other sociodemographic characteristics are not statistically significant.

Table 3. Differences between respondents from rural and urban areas – mean (M), standard deviation (SD) and t values

Latent Dimensions	Urban	Rural	t values
	M(SD)	M(SD)	
Sexual objectification of the female body	5.41(0.94)	5.05(1.04)	3.10**
Promotion of the "ideal" female body	5.60(0.97)	5.28(1.04)	2.74**
Instrumentalization of the female body	5.84(0.84)	5.56(1.04)	2.60**
RFB scale (total average score)	5.60(0.80)	5.27(0.93)	3.25**

Level of statistical significance: *p<0.05; **p<0.01.

Source: authors

DISCUSSION

The respondents saw the abuse of the female body as the phenomenon that is most present in the media sphere. They are aware that in representation, the female body is constituted as a thing that needs to be constantly beautified and that can be changed at will, and that the importance of physical appearance is exaggerated. They see the media image of the "ideal" female body as an instrument for making a profit in the fashion, cosmetics, pharmaceutical, fitness and other industries. They notice the manipulations used by the media and marketing, which reduce the female body to a product that is served to potential consumers. As Leimore (Leymore, 1975) noted long ago, marketing creates and fuels dominant attitudes, values, social norms, and myths and thus influences the behavior of many people - performs a function like a myth

in ancient and primitive societies. Marketers know that as a symbol of attraction, the female body has hypnotic power and leaves a strong impression on all target groups. It evokes a feeling of happiness and satisfaction when viewed in advertisements or media content, and such a feeling drives consumers to buy a product or service in the hope that it will be repeated. In most cases, the customer is not even aware of it because it happens on a subconscious level, and emotions cannot be easily controlled. When the consumer remembers a certain product, he also remembers the images associated with it, which serves as a trigger to revive the feeling of satisfaction and happiness. In addition to the abuse of the female body in order to make a profit, the existing (patriarchal) gender regime in which a woman is subordinate to a man is maintained through the stereotypical representation of women and the female body. Women and women's bodies in the media occupy the most colorful pages, intended for relaxation, entertainment, topics that belong to the private sphere of life - the public scene, decision-making, important things should be left to men.

Closely related to abuse is the promotion of the "ideal" female body, the imposition of standards on how a woman should look. This dimension is somewhat less represented in relation to the instrumentalization of the female body in the media sphere. The results show that respondents recognize the role of the media and marketing (in collaboration with the beauty industries) in constituting beauty standards, the image of the "ideal" female body (the perfect stereotype), the model they should strive for. Namely, by creating and imposing unattainable standards of beauty, they put a woman in an unenviable position, pushing her into an endless process of achieving them. The beauty industry, media, marketing benefit from that, while the woman remains trapped in that vicious circle. Consciously or unconsciously, most women accept the situation in which she is pushed and agree to this game in the hope that she will be more appreciated and respected, that she will achieve satisfaction and self-respect. Adopting cultural standards about body appearance and developing skills that enable control of appearance can have a positive and empowering effect on a woman, and observing one's own body can evoke a sense of satisfaction.

Such behavior can also have negative consequences, in the form of feelings of shame, alienation from one's own body, and alienation from oneself (McKinley & Hyde, 1996). The degree of satisfaction with the body is negatively related to the degree of internalization of cultural standards of beauty (Velov & Zotović, 2020). The importance of education for reducing the internalization of social standards on female beauty is provided by the results of research in which respondents are specially trained how to critically approach the media and how to reduce the internalization of the ideal of thinness, as well as research in which tasks to speak, write against this ideal [(Stice & Ragan, 2002); (Stice, Shaw, Burton, & Wade, 2006)]. In all these researches, there was a decrease in the degree of internalization of these ideals, as well as a decrease in the level of dissatisfaction with the body.

Although, like the previous two dimensions, it is quite common, the sexual objectification of the female body is perceived by the respondents as the least present in the media sphere. They stand behind the opinion of feminists that the female body is treated as an object and thus its identity is abolished - when a woman is determined exclusively by her body, at the same time her face is taken away, which is a symbol of diversity and subjectivity (Višnjić & Miroslavljević, 2012).

Within this dimension, the target presentation of female body parts stands out, which they see as a common practice of the media and advertising industry to attract the attention of potential users the form of sexual objectification described by Bartky (Bartky, 1990). In the race for profit, belittling women, sexism and sexualization become powerful weapons. Most often placed in a subordinate position in relation to a man, eroticized and objectified, a woman is accompanied by sexist messages, based on gender stereotypes, because that is the easiest way to get the attention of the male population.

Given that these are respondents from the academic community, i.e. respondents who mostly study or have obtained higher education, the results are somewhat expected and logical - it is likely that respondents are familiar with the problems that exist in intellectual discussions initiated by feminists, authors and researchers of gender issues, and thus with observations and criticisms of the way in which women and the female body are presented and treated in the media sphere.

The validity of the manifested differences in the presence of the described forms of representation of women and the female body is supported by the hypothesis of the influence of the educational status of the respondents on the outcome of the results - they more adequately recognize, differentiate and evaluate the ways in which women and the female body are presented in the media sphere.

These interpretations also include differences between groups defined by socio-demographic characteristics. The analysis of the obtained results shows that both on the overall scale and in the dimensions, women from urban areas show a higher score than women living in rural areas, while age, marital status, education and region do not play a significant role in evaluation, there is no statistically significant difference between the groups defined by these sociodemographic characteristics. Namely, the influence of education on the outcome of results can be assumed here as well - there are no differences in the answers of groups, except in groups defined by place of residence, where we can recognize the influence of patriarchy, i.e. its role in understanding the researched problem. As a rule, residents of rural areas strongly represent patriarchal values, and accordingly, it is to be expected that they are less supportive of feminist observations about the representation of women in the media sphere.

The results of testing metric characteristics provide the basis for determining the use value of the instrument for some other (future) research. They showed that the internal consistency of items is high (expressed by the Cronbach's alpha coefficient), i.e. the scale shows high reliability, and the values of item total correlation that discrimination is acceptable, that it is sensitive to differences in respondents' responses. Factor analysis extracted three components that are defined based on the content of the items that make them up, and which also have a high degree of reliability. In addition to gaining insight into the factor structure, factor analysis also confirmed the constructive validity of the instrument. There is a high degree of correlation between the extracted components, and the second-order factor analysis confirmed the one-dimensionality of the scale. These characteristics recommend a scale for use in our cultural area.

Creating a framework for the ethical representation of women and the female body in the media sphere (marketing / advertising, media, social networks, etc.), in a way that respects the integrity, uniqueness and personality of women, by adopting numerous documents by international organizations and domestic legislation is certainly

for praise. But the results suggest the need for additional efforts to curb discriminatory forms of representation of women in the media and marketing. It is important to constantly point out both overt and covert forms of discriminatory behavior, and they are present not only in the media, but also in other spheres of public and private life. Thanks to the feminist movement and activism, many forms of discrimination, not only against women, but also against other vulnerable groups, have been exposed, socially aware and a process has been launched to combat them. Therefore, in the fight against discrimination, it is necessary to include society as a whole, but every individual can play a significant role in that.

CONCLUSION

The main goal of this paper was to determine the attitude of the respondents (women) towards the way in which women and the female body are presented in the media and marketing. For this purpose, a seven-point Likert-type scale was constructed, which contains claims based on the critical observations of feminists. The results showed that there is a high degree of similarity between the respondents' attitudes and the observations of feminists - they agree with all the statements that describe the way in which a woman and a woman's body are presented in the media sphere. Although all three dimensions are quite represented, the most pronounced is the abuse of women and the female body in the media. The nature of abuse is twofold, the goals are clearly defined: first, stereotypical representation allows a woman to be humiliated and placed in a subordinate position in relation to a man and thus enable the maintenance of a patriarchal gender regime, and second, to serve for profit by various industries (cosmetic, fashion, marketing, media, etc.). In addition to the tendency for women and the female body to be abused in the media sphere, the respondents also recognize the way in which it is realized - most often through sexual objectification and the promotion of images of the "ideal" female body. The type of settlement in which they live is the only variable according to which the respondents differ statistically significantly in their answers - respondents from rural areas have a significantly higher score on the overall scale and its dimensions compared to respondents from urban areas. The research answered some of the questions related to women and the female body in the context of representation in the media sphere and marketing, and the Scale of attitudes towards the representation of the female body (RFB scale) played a key role in that. The metric characteristics of the instrument used indicate that it is usable for some other (future) research. However, like any other, this research has certain shortcomings that should be taken into account and treated as guidelines for future research. It should be noted that the sample was targeted – women answered the questions, but the educational structure is not diverse. Respondents mostly study or have a higher education, so it can be assumed that they are familiar with feminist attitudes. This may affect the outcome of the research results. This assumption induces the need for new research that will include women with lower education.

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THE CREDIT GROWTH AND ECONOMIC ACTIVITY IN BOSNIA AND HERZEGOVINA

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Abstract: *We have analyzed the impact of credit growth on economic activity in period before, during, and after credit crunch in Bosnia and Herzegovina i.e. from Q12007 to Q42012. In this period, credit growth on average proved itself as a good signal of economic contraction and economic slowdown. This is the first time that interdependence between credits and GDP in Bosnia and Herzegovina was established through the receiver operating characteristic methodology and through receiver-operating characteristic. The main research finding shows that level of credit growth is a good signal of substantial decrease of economic activity in case when credit growth was previously very high. The regulators and banking supervision should not allow excessive growth, because during and after credit crunch contraction of economic activity can happen even when credit growth rate is relatively high. This research is one of the first steps in creating early warning system for Bosnian economy by using banking sector data and national accounts data.*

Key words: *early warning indicators; receiver-operating characteristics; noise to signal ratio; credit growth; macroeconomic imbalances.*

JEL classification: *G01, E51, C25.*

INTRODUCTION

The Bosnia and Herzegovina's financial system is bank based which means that majority of external financing is provided by commercial banks. In period 2007-2012 BH governments were not so active on domestic financial market, so the main driver of economic activity was internal demand driven by commercial banks credits. In this period, BH went through the boom and bust credit cycle, and credit crunch happened in 2009. According to all these facts, credit growth should be a good signal for crisis event (slowdown in GDP) i.e. good Early Warning Indicator/EWI, and this is the main research hypothesis.

This research connects credit growth and GDP growth by applying signal approach i.e. receiver operating characteristic methodology. We want to answer the the

question if there is some level of credit which could trigger economic growth slowdown, with high probability and high certainty. Therefore, the research's subject is the connection between credit growth and crisis event, and the main goal is finding threshold for credit growth, which signalizes crisis event with high certainty.

The research is organized in five parts. In the first part, main facts about credit and growth are presented, and in the second, we give short review of the main literature in this field. These sections are followed by methodology, results and discussion, conclusion and list of used references.

LITERATURE REVIEW

Due to heterogeneity between even similar group of countries and poor performance of in such a way calculated signals/indicators for crisis event our research is in line with proposal (Knedlik, 2015) that creating the country-specific thresholds for signals is the best way to capture crisis event. The credit growth as signal for crisis has broad and different interpretation and use, and it is connected with economic crisis, recession, economic slowdown, currency crisis, and macroeconomic imbalances. The most useful leading indicators of crisis (Babecky, et al., 2012) besides domestic housing prices, share prices and global prices is credit growth. In Macroeconomic Imbalance Procedure (European Commission, 2012) change in credit compared to the GDP is marked as one of leading indicators of macroeconomic imbalances in the financial sector. Together with external imbalances, high **indebtedness** and strong real GDP growth lending and housing boom is connected with financial crisis (Bunda & Zorzi, Signals from housing and lending booms, 2009). The same finding, interconnection between credits and external deficit in causing the crisis was found in another paper (Davis, Phoa, Mack, & Vandenabeele, 2014). In the long horizon the credit-to-GDP gap is the the best indicator of banking crisis, and in the long run debt service ratio has the same characteristic in the short run (Drehman, 2013). The banking crisis coincides or precedes very often to the currency crisis and economic crisis. The total credit rather than bank credit alone predicts with more preciseness the risk of systemic crisis (Drehman, 2013). The research in money and credit growth after economic and financial crisis (ECB, 2012) showed that M1 growth typically leads change in business cycle; change in broad money is in line with cycle, while credit growth recovers very slowly comparing economic activity. Very detailed and comprehensive research (Frankel & Saravelos, 2012), stressed the fact that usefulness of indicator in predicting crisis varies over time. It found that most robust indicators of crisis are international reserves and real exchange rate overvaluation, and some indicators, credit growth is among them, are also associated with crisis event. By applying signal approach (Kaminsky, Lizondo, & Reinhart, 1998) is found that domestic credit issue first signal 12 months before crisis occurs and that persistence of signal is in the middle of the range. The group of Hungarian authors (Lang, Cosimo, Fahr, & Ruzicka) developed broad based cyclical systemic risk indicator (d-SRI) which contains risks deriving from domestic credit, real estate markets, asset price and external balance. d- SRI predicts significant decrease in GDP three or four years ahead of crisis. After the crisis decline in bank credits to private sector must not be accompanied with slow recovery, after output touch the bottom as aftermath of financial crisis (Takatas & Upper, 2013). Another research applied to CEE-10 stressed the findings that the best signaling system presents

combination of different variables, and among them is credit-to-GDP gap (Csontos & Szalai, 2014). Regarding connection between foreign and Bosnian economy one research (Jović, Dragan, 2017) found that interest rate channel (Fed Fund Rate) has very strong and significant effect on Bosnian real sector, especially on industrial production. Another research (Jović, Dragan, 2019) concluded that without Vienna Initiative (international rescue plan for CSEE during GFC) fall in industrial production in Bosnia and Herzegovina would be even bigger. These two researches, due to its topics, are some kind of introduction in this research.

METHODOLOGY

According to one proposal (Babecky, et al., 2012) early warning indicators can be separated in three categories: the late EWI (signal is issued 1-3 quarters ahead), early (4-8 quarterly ahead) and ultra-early (9 and more quarters ahead). Because of very fact that data on loans in BH are issued at least two months ahead of GDP credit growth rate can be treated as EWI, i.e. very late EWI. Even without the time lags comparing to the crisis event (slowdown in GDP), credit growth rate is well suited to act as EWI, and we applied this approach in the research.

The heart of applied methodology is confusion matrix in relation to receiving operating characteristics i.e. to signal approach in discovering the economic downturn. In confusion matrix (Table 1), there are two possible states of economy, crisis (1), and no crisis (0), and on the other hand, signal can say there is a crisis (1) there is not crisis event (0). In two times two confusion matrix there are four main elements (see shadow area in table below), and there explanation is following. If there is a crisis which is confirmed by signal that is true positive (1, 1), and if there is no crisis despite signal that is false positive (0, 1). In situations without signal we also have two possible outcome, false negative (1,0) if there is a crisis, and signal is missing, and true negative (0, 0) if there is no crisis, a and there is no signal also.

Table 1. Confusion matrix

		Crisis	No crisis
		1	0
Signal	1	True positive/TP (1,1)	False positive/FP (0,1)
No signal	0	False negative/FN (1,0)	True negative/TN (0,0)

Source: Author

With this signal's statistics it is possible to calculate different receiver operating characteristics quality indicators and measures, and for the purpose of research we have chosen eight of them (Table 2). Their interpretation is very intuitive, and logical conclusion about quality of signals that they are better if we have more true than positive rates. For example, possibility of positive outcome is measured by PPV or precision, and it says what probability of predicting crisis is if signal/alarm is sent. ACC measures true signals (no matter if there are positive or negative) by comparing them to the all-possible outcomes. Intuitively it is obvious that the lower is Noise to signal rate (NtR) quality of signal is better, and we can dismiss signal if its value is

equal or more than one, or if it is only slightly below 1. TPR, FPR, FNR, TNR are getting directly by combining two compatible elements of confusion matrix. TPR is hit rate because it measures how much signal is success in hitting crisis, and its compatible value is FNR or miss rate.

Table 2. ROC indicators and measures

Indicator's name	Alternative name	Calculation
1 True positive rate (TPR)	Sensitivity, Recall, hit rate	$TPR = TP/(TP+FN)$
2 False positive rate (FPR)	Fall-out, False alarm Type I error	$FPR = FP/(FP+TN)$
3 False negative rate (FNR)	Miss rate Type II error	$FNR = FN/(TP+FN)$
4 True negative rate (TNR)	Specificity, Selectivity	$TNR = TN/(FP+TN)$
5 Positive predictive value (PPV)	Precision	$PPV = TP/(TP+FP)$
6 Accuracy (ACC)	-	$ACC = (TP+TN)/(TP+FP+FN+TN)$
7 Noise to signal rate (NtR)	-	$NtR = FPR/TPR$
8 Area under curve (AUC)	Area under curve receiver operating characteristics (AUCROC)	The integral under ROC curve

Source: Author

The ROC is also creating by comparing TPR and FPR i.e. by plotting sensitivity against false alarm, for different signal's thresholds. In machine learning TPR and FPR are denoted as probability of detection and probability of false alarm respectively. By creating the ROC curve, we get area under curve or AUC or AUCROC, which discriminates between good and bad signals. ROC is plotted in (0, 0) and (1, 1) coordinate space, so its total value is 1. If ROC is linear, and AUC is 0.5 signal is not capable to discriminate between to states, or in our case, crisis or no crisis, and if AUC is below 0.5 we can dismiss signal completely. The more AUC is above 0.5 and closer to maximum value i.e. 1 the model and signal is better.

In order to set threshold for signal i.e. nominal annual credit growth sample is divided in ten quantiles i.e. in deciles (Table 3). The threshold for credit growth is set on first, second, third and fourth deciles i.e. on -2,03%, 0,47%, 4,86% and 5,13% respectively. The last two deciles are high, but comparing to the whole credit growth distribution these values are relatively small. In order to calculate TRP and FPR and to plot ROC curve quantiles of credit growth are connected with ratings in the way that lowest value get higher rating and so on. In the research we define crisis/crisis event in two ways, as real GDP growth rate below 1%, or as GDP growth rate below 0% i.e. negative growth rate. The distribution of credit growth rates with ten deciles uses two crisis event in order to estimate ROC curve, area under curve, and signal's performance. Real GDP growth below 1% represents slowdown in economic activity while drop in GDP below 0% is proxy for recession.

Table 3. Quantiles and associated ratings in nominal credit growth rate in banking sector of Bosnia and Herzegovina (Q1 2007 – Q2 2012)

Percentiles	Growth rates %	Rating	Interval
1	-2,03	10	to -2,03
2	0,47	9	from -2,02 to 0,47
3	4,86	8	from 0,48 to 4,86
4	5,13	7	from 4,87 to 5,13
5	5,50	6	from 5,14 to 5,50
6	6,66	5	from 5,51 to 6,66
7	22,97	4	from 6,67 to 22,97
8	29,55	3	from 22,98 to 29,55
9	31,28	2	from 29,56 to 31,28
10	31,83	1	from 31,29 to 31,83

Source: Author

EMPIRICAL DATA AND STYLIZED FACTS ABOUT CREDIT GROWTH AND ECONOMIC GROWTH IN BOSNIA AND HERZEGOVINA

For research we have chosen period Q1 2007 – Q4 2012 because of couple of reasons. In middle of this period, (2009) credit crunch is happened and that period is rich with crisis event, i.e. with big drop in GDP growth real rate. During this time horizon BH governments where not engaged on financial market at all, or were not engaged heavily, which left economy strongly dependent on banking loans. Also in this time, the old statistical methodology (NACE1) for measurement of GDP was in use.

From the beginning of 2007 until the end of 2012 credit growth was very volatile as well as real GDP growth rate. This very volatile period was part of business and financial cycle started in 2003 after bank privatization happened, and it was fueled by inflow of foreign capital and increase in domestic saving. From 2003 credit growth rate was double digit in almost all years till 2008, and due to sudden stop of foreign loans and deposits credit crunch happened. After that credit growth rate is or negative or slightly above zero. Credit growth rate started with 27,45% (Q1/2007) and ended with 4,3% (Q4/2008), on average was 12.96% and minimum was -3,19% (Table 4). Measure with coefficient of variation variability was very high and the same can be seen by comparing the highest and the lowest value.

Table 4. Credit growth rate (q/q-4) in BH, descriptive statistics, Q12007 – Q22012

Obs.	Mean	Standard deviation	Coefficient of variation	Minimum	Maximum
24	12,10	12,96	1,07	-3,19	31,83

Source: CBBH (Adapted by author).

This period of BH's transition was characterized by very high fluctuation in real GDP growth rate also, with even higher volatility comparing to the loans (Table 5).

Real GDP growth rate was on average 1,54%, ranging from -3,35% to 12,72%, with standard deviation 2,57 larger then mean.

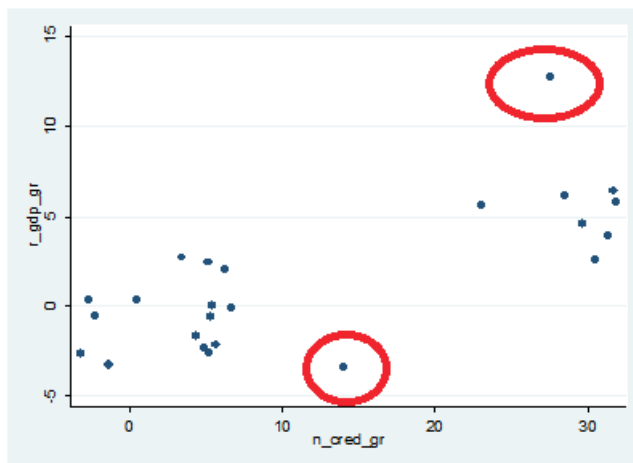
Table 5. Real GDP growth rate (q/q-4) in BH, descriptive statistics, Q12007 – Q22012

	Obs.	Mean	Standard deviation	Coefficient of variation	Minimum	Maximum
Real GDP growth rate	24	1.54	3.96	2.57	-3.35	12.72

Source: BHAS (Adapted by author).

There is a very high positive correlation between these two variables even we do not exclude two obvious outliers marked with circles (see graph 1). The variables move in the same, positive, direction.

Graph 1. Real GDP growth rate vs credit growth rate, 2007-2012.



Source: Author

Simple linear regression shows high and positive influence of credit growth on GDP growth, and it does not matter if constant is or is not included (Table 6 and Table 7). Almost all parameters in both equations are highly significant, but it seems that model without constant works better. On average 1 percentage point change in credit growth will increase GDP for around 0.2 percentage points. The high significance of regressors together with big enough R-squared shows that credit growth could be a good signal for changes in economic growth.

Table 6. GDP vs. credit, with constant

r_gdp_gr	Coefficient	Std. Err.	t	P> t	[95% Conf. Interval]	R-squared
n_cred_gr	0.23	0.042	5.39	0.00	0.14 - 0.32	0,57
constant	-1.24	0.75	-1.66	0.11	-1.24 - 0.75	

Source: Author

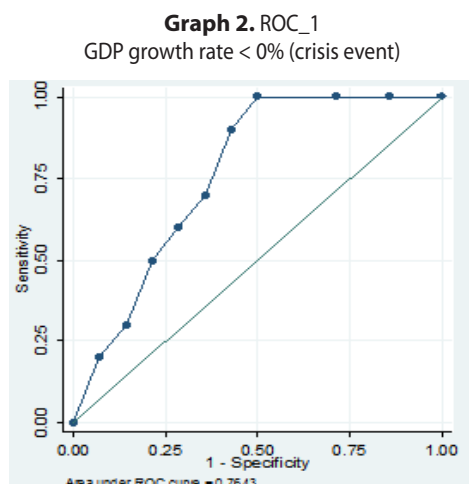
Table 7. GDP vs. credit, without constant

r_gdp_gr	Coefficient	Std. Err	t	P > t	[95% Conf. Interval]	R-squared
n_cred_gr	0.18	0.0321	5.65	0.000	0.115 - 0.247	0,58

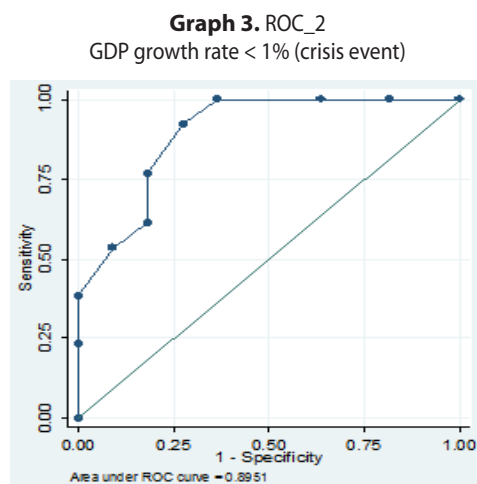
Source: Author

RESULTS AND DISCUSSION

Both estimated ROC curves have high values, and they are far away from middle line, which indicates that signal has discriminatory power. AUC is above 0.5 ranging between 0,76 and 0,89.



Source: Author



Source: Author

The main message of eight confusion matrix (Table 8 and Table 9) is that theirs false positive elements in almost all cases are very small, so in this term signal has the high level of preciseness. The second message/characteristics of confusion matrix is that in many cases signal misses the crisis (false negative). It does not show that there is a crisis even there is a crisis. The overall performance of confusion matrix, captured by increase in true positive and decrease in false negative increase with rise in credit growth threshold.

Table 8. Elements of confusion matrix, crisis event GDP growth rate < 0%

	ROC_1		ROC_2		ROC_3		ROC_4	
Threshold	=< -2,03		=<0,47		=<4.86		=<5,13	
	Crisis	No crisis	Crisis	No crisis	Crisis	No crisis	Crisis	No crisis
Signal	2	1	3	2	5	3	6	4
No signal	8	13	7	12	5	11	4	10

Source: Author

Table 9. Elements of confusion matrix, crisis event GDP growth rate < 1 %

	ROC_5		ROC_6		ROC_7		ROC_8	
Threshold	=< -2,03		=<0,47		=<4.86		=<5,13	
	Crisis	No crisis	Crisis	No crisis	Crisis	No crisis	Crisis	No crisis
Signal	3	0	5	0	7	1	8	2
No signal	10	11	8	11	6	10	5	9

Source: Author

ROC curves are better if we measure them by slowdown in economic activity (GDP < 1%), then if we want to capture drop in GDP below 0%. ROC_5, ROC_6, ROC_7 and ROC_8 perform relatively better comparing to ROC_1, ROC_2, ROC_3 and ROC_4. If we compare the second group of models (crisis event is GDP g.r < 1 %) with first one (crisis event is GDP g.r < 0 %) we can see easily that the second group of models outperforms the first group of model (Table 10 and Table 11) in all indicators; TPR, TNR, PPV, ACC are higher, and FNR, FPR and NtR are lower.

According to AUCROC, all models very good discriminate between crisis event and no crisis event. In all cases AUCROC is far above 0,5.

In all eight models, Noise to Signal ratio (NtS) is substantially below one, i.e. noise is very low comparing to correct signal (FP/TP). In two models, NtS is even zero (ROC_5 and ROC_6) because false positive cases are missing. Models with GDP lower then 0 as crisis event significantly higher NtS comparing to other group of models.

Accuracy of models, share of true positive and true negative in all events ((TP+TN)/N), is between 58% and 71%, and that is satisfactory result.

Possibility that crisis event will be predicted (positive predictive value/PPV or in short Precision) which means when signal is issued crisis event happen (TP/(TP+FP)) vary between 20% and 62%, and these results vary significantly. False positive rate is very low with maximum value of below 30%. Main objection to signal quality is value of FNR (false negative rate) which is in some cases very high. It means that there is a crisis, and signal does not ring, or in other words, crisis is missed. In terms of FNR models with higher threshold (in terms of credit growth) perform relatively better (comparing to the models with lower threshold), and the same is true for models which take slowdown in GDP as crisis event. Regarding FNR the best model is ROC_8 and this model has on average the best performance highest TPR and ACC, and lowest FNR, with all other indicators on satisfied level.

Table 10. ROC indicators and measures, crisis event GDP growth rate < 0 %

Indicator's name	ROC_1	ROC_2	ROC_3	ROC_4
	credit g.r. threshold =< -2,03%	credit g.r. threshold =< 0,47%	credit g.r. threshold =< 4,86%	credit g.r. threshold =< 5,13%
1 True positive rate (TPR)	20	30	50	60
2 False negative rate (FNR)	80	70	50	40
3 False positive rate (FPR)	7,14	14,28	21,42	28,57
4 True negative rate (TNR)	92,85	85,71	78,57	71,4
5 Positive predictive value (PPV)	66,67	60	62,5	60
6 Accuracy (ACC)	62,5	62,5	66,7	66,6
7 Noise to signal rate (NtS)	0,357	0,476	0,4285	0,476

Source: Author

Table 11. ROC indicators and measures, crisis event GDP growth rate < 1 %

Indicator's name	ROC_5	ROC_6	ROC_7	ROC_8
	credit g.r. threshold =< -2,03%	credit g.r. threshold =< 0,47%	credit g.r. threshold =< 4,86%	credit g.r. threshold =< 5,13%
1 True positive rate (TPR)	23,07	38,46	53,84	61,53
2 False negative rate (FNR)	76,92	61,53	46,15	38,46
3 False positive rate (FPR)	0	0	9,1	18,18
4 True negative rate (TNR)	100	100	90,9	81,81
5 Precision (PPV)	100	100	87,5	80
6 Accuracy (ACC)	58,3	66,6	70,83	70,83
7 Noise to signal rate (NtS)	0	0	0,16	0,29

Source: Author

CONCLUSION

We applied ROC methodology in order to discriminate between quality of different models with calculation of area under curve, and different signal quality indicators. The chosen time is very short, and in order to obtain enough crisis event we define it in two ways, not only as negative real GDP growth, but also as the drop of GDP below 1%. We divided also credit growth rate in deciles and put threshold on first, second, third and fourth deciles. The credit growth rate proved itself as, on average, a very good signal for crisis event, especially if we define crisis as growth of GDP below 1%. Also, the credit growth rate performed very well for signaling the drop of GDP below 0%. With these findings, we have proved the research hypothesis. The main objection to signal quality is the value of FNR (false negative rate) which is above 0,5 in four out of eight models. It means that there is a crisis, and signal does not ring, or in other words, crisis is missed. Three models have FNR below 0,5, and they perform best in terms of FNR. According to the high value of TNR all models predict

on satisfactory level absence of crisis very well. All two group of models discriminate very well between crisis event, and the absence of crisis event because noise comparing to the signal is very low, but the second group of models (with GDP growth rate below one as crisis event). Possibility that crisis event is correctly predicted (positive predictive value) is more than 60% in all models which means that false positive rates are on average very low. From the very research's results, we can draw a couple of recommendation and ideas for policymakers. It can be said forsure that GDP growth rate is very sensitive to credit growth rate, especially in the case when credit growth is high, and because of that when credit crunched occurs higher public spending must compensate for it i.e. for credit growth. In order to have room for additional public spending BH have to accumulate budget surpluses during economic expansion and it have to keep public debt on low level to facilitate expected intervention during slow-down. The policymakers and banking sector regulators may not allow credit boom anymore, because after bursting credit bubble crisis event will happen even is credit growth rate is relatively high. In order to mitigate consequences of credit crunch in providing external sources of funding internal financial market have to be more developed. In boosting economic during credit crunch government should be more oriented on borrowing through financial markets. Further research of this kind could be focused on relationship between international economic environment and GDP growth rate in Bosnia and Herzegovina. Future research can answer the question whether there are some foreign economic variables which signal downturn and or recession in BH economy. In addition, if the main goal of economic policy is reindustrialization of economy then crisis event can be significant drop in industrial activity. In addition, in relation to GDP growth rate, some of its components, which are leading indicators of recession, can be used instead of economic growth, and/or industrial activity itself.

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CONNECTING INTERNATIONAL R&D COOPERATION AND TECHNOLOGY SPECIALIZATION IN OECD COUNTRIES

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Abstract: *Technology specialization is supported by processes combining inhouse and external innovation. Applying a macroeconomic and international trade theory approach (Linder, 1961), country specialization depends on international R&D cooperation partnerships. External, international R&D cooperation is essential for technology specialization, as it raises awareness of countries' position on a global technology map. This paper studies international R&D cooperation as a determinant of countries' technology specialization. Cross-country panel regression was done on a sample of 37 OECD countries for the period 1980-2018. The analysis examined the effect of international R&D cooperation on technology specialization. Data were obtained from the OECD database. Co-patenting with foreign inventors was used to indicate the level of international R&D cooperation. Patent per technology was used to calculate technology specialization based on the Herfindahl index. Results indicate a positive effect of international R&D cooperation on technology specialization. The effect of R&D cooperation on technology specialization is more pronounced when GDP and R&D expenditure were used as control variables. Additionally, the size of the GDP negatively affects technology specialization. This paper identifies international cooperation as a bridge for global information exchange, which results with countries' technology specialization.*

Key words: *International co-operation; Country technology specialization; Cross-country panel regression; OECD.*

JEL classification: *O31, O33, F62.*

INTRODUCTION

Innovation requires exploration of activities beyond existing technological knowledge boundaries, including its recombination and exploitation to create radically different products and services. Self-reliance strategy in innovation activities became

obsolete due to innovation process complexity, R&D cost intensity, shorter product life cycles and competitive pressures. With its ability to surpass the problem of optimization in knowledge sharing (Takeishi, 2002) and production, R&D collaboration became important for technology upgrade. With its ability to cross country borders, R&D collaboration grows exponentially, facilitates knowledge flows and enhances countries' competitive advantage (Ma & Lee, 2008). Based on a trend of R&D collaboration, technology portfolio increases. Herein, literature distinguishes between two basic directions of technology portfolio growth depending on the way homogeneous or heterogeneous inputs and ideas get creatively recombined: (1) diversification and (2) specialization of portfolio (Lin, Chen, & Wu, 2006). In order to achieve portfolio synergic effect, strategic portfolio management is necessary (Appio, De Luca, Morgan, & Martini, 2019). Innovation activities can be based on collaboration between partners from technologically different and, therefore, distant fields, which could result in radical innovation (Chen, Yang, & Lin, 2013). On the other hand, the homogeneity of partners' technology base can lead to limited novelty, incremental innovation.

This paper is framed around a debate about technology portfolio concentration. Indicating the importance of international collaboration, this paper questions whether the variety of international knowledge sources lead a country toward homogenic or heterogenic technological portfolio. Our findings indicate that a trend of international collaboration, as a source of international knowledge, leads towards high technology concentration. High level of technology concentration indicates that innovation and technology upgrade is based on a recombination of homogenic, existing and familiar knowledge. At first sight an access to complementary and multiple international knowledge sources creates potential for technology portfolio diversification. However, high technology concentration implies a lack of absorptive capacity because of the inability to acquire heterogeneous knowledge. Consequently, a low level of absorptive capacity stirs innovation search toward close and familiar partners, both on the local and global level. These findings complement previous findings on the importance of close, collaborating partners in the process of knowledge recombination (Phelps, 2010; Tripunoski, Nikolovski, & Vasileva, 2015). Furthermore, this paper implies that despite the ability to access diverse international knowledge, a low level of absorptive capacity might cause country to lock into specific technology field (De Noni, Ganzaroli, & Orsi, 2017).

The paper is organized as follows. The next section presents an overview of collaboration and technology concentration literature, which is followed by explanation of the relationship between international collaboration and technology concentration. Methodology and results are presented in the subsequent section. The last section summarizes the conclusion of the study including contributions and limitations for further research.

LITERATURE REVIEW

Collaboration is responsible for development of almost all contemporary products (Picci, 2010). Collaboration is defined as an activity of exchanging significant amount of knowledge and resources between two or more partners (Yamin & Otto, 2004). From the organizational perspective it takes a wide spectrum of inter-organizational modes: from total partner independence to complete interdependency. Regardless of the collaboration mode used, its goal is to increase knowledge production and

exchange. Last three decades witnessed a significant expansion and decentralization of knowledge networks. The rise of innovation process complexity, shorter product life cycle and competitive pressures fostered the inclusion of R&D collaboration into organizational practices. R&D collaboration enables tacit knowledge exchange (Takeishi, 2002) thereby creating less costly innovation (Husted & Michailova, 2010). The importance of R&D collaboration for innovation (Arvanitis, 2012; Puventhiran & Tugsuz, 2017; Capuano & Grassi, 2019) is studied in different research streams. Some of them include: partner types (Alcácer & Chung, 2007; Badillo & Moreno, 2016), network position (Bettencourt, Kaiser, & Kaur, 2009), regions' technology competitiveness (Fleming, King III, & Juda, 2007) and industries' knowledge creation (Lim & Park, 2009). Variety of theoretical and empirical approaches resulted in both advantages and critique of R&D collaborations. R&D alliances are beneficial for controlling uncertainty of complex technologies. Furthermore, they allow partners to receive access to each other's specific resources. On the other hand, partner search, negotiation and contracting can result in increased costs of R&D collaboration (Van Beers & Zand, 2014), while strong embeddedness in one network might hold organizations back from other potential collaboration opportunities (Gulati, Nohria, & Zaheer, 2000).

Strong internationalization of R&D collaboration, often referred to as "Techno-globalism", is an extension of internationalization of trade, investment and accumulation of technological capabilities (Bergek, 2010). Despite the importance of local and technologically close collaborations for, usually, incremental innovations (Picci, 2010), international and technologically distant R&D collaborations are indispensable for generating radical ones (Moodysson & Jonsson, 2007). Innovation complexity and variety of national economic, social, and inter-country settings, palaced international R&D collaboration network on research agenda of many authors (De Prato & Nepelski, 2014). Hence, researchers focused on the effect of geography on collaboration (Gao, Guan, & Rousseau, 2011; Cantner & Rake, 2014). Studies examined the effect of multilevel, city and country, networks on innovation (Guan, Yan, & Zhang, 2017) or international knowledge flow.

Acceleration of global competitiveness induces pressures on production process. Optimization of production processes rests on technology upgrade, which enables the growth of technology portfolio (Appio, De Luca, Morgan, & Martini, 2019). Diversification and specialization are two distinct strategies of achieving portfolio synergic effect. Diversification-specialization distinction depends on recombination of homogeneous or heterogeneous inputs, affecting the technology trajectory. Recombination of homogenous body of knowledge resulted in upgraded technology (Boschma, Balland, & Kogler, 2015; Colombelli, Krafft, & Quatraro, 2014; Essletzbichler, 2015) being kept on same trajectory, and indicating a knowledge specialization, which is a prerequisite for achievement of strong technology portfolio synergic effect (Lin, Chen, & Wu, 2006). Namely, accumulation and depth of specialized technological knowledge (Parchomovsky & Wagner, 2005) provides a strong barrier to entry (Shapiro, 2001) and high returns to investments due to a monopoly in specific technology area. Learning and transfer of knowledge are enhanced within a specialized technology portfolio, forming a foundation of a strong competitive advantage (Lin, Chen, & Wu, 2006). Specialization can, thus, lead to more innovations than a more diverse technology portfolio (Garcia-Vega, 2006) and result in complex product lines.

However, specialization does not come without cost. Being locked within a specific technology field leaves a little room for quick adjustments to fast changes in industry trends (Quintana-García & Benavides-Velasco, 2011), making technology brokerage unavoidable for technology growth (Carnabuci & Bruggeman, 2009). In order to prevent lock-in, an expansion to a variety of technology fields becomes an optimal strategy when composing a risk-averse technology portfolio. Technology portfolio diversification has the ability to generate radical innovation due to an intervening effect of various technology fields (Chen, Yang, & Lin, 2013). This increase transaction costs resulting from difficulties in coordination and communication within technology portfolio, additionally, it that might affect successful integration of technological knowledge. Recent trends, however, point towards diversification with coherent patterns based on technological complementarity between partners' knowledge bases. Finally, this discussion should not lead toward understanding of specialization and diversification as distinct concepts, but rather endpoints in the broad spectrum of technologies.

Collaboration provides partners with access to specific and spatially distributed knowledge and resources. However, variety of knowledge does not imply compatibility. Technological, geographical, social, institutional and organizational distance among collaborating partners result in different levels of homogenic/heterogenic knowledge (De Noni, Ganzaroli, & Orsi, 2017), whose exploitation differs. Absorption of knowledge is easier if a knowledge domain is closely related to its current knowledge base (Cohen & Levinthal, 1990). However, with absorption of homogenic knowledge partners are very limited in number of innovative combinations. This spurs a motivation to approach and absorb more heterogenic knowledge. Collaborating with different distant partners reflects a need for balanced ratio of homogeneous and heterogeneous knowledge absorption (De Noni, Ganzaroli, & Orsi, 2017). As new knowledge is always derived from re-combinations of existing knowledge, the extent of specialization and diversification will depend on creative re-combinations of homogeneous and heterogeneous inputs.

These arguments posit a question whether variety of international knowledge sources/partners leads a country toward a more specialized or diversified technological portfolio.

METHODOLOGY

This study uses OECD database for the period between 1980 and 2018 of 37 OECD countries. OECD countries comprise core knowledge creators. More specifically, the majority of international knowledge interactions, comprising international patenting activities, are performed within the OECD group (Guan & Chen, 2012). Furthermore, OECD countries account for 83% of the global R&D expenditure. Hence, this paper uses explores the link between international co-patenting activities and technology specialization of 37 OECD countries. Patents are the most significant innovation output indicator (Frietsch & Grupp, 2006). Patents are intellectual property rights generated by inventor enabling him or her the sole right to exclude others from making, using or selling their invention for a set period of time, in most cases for the period of 20 years. Technology concentration is calculated by using Herfindahl index, which is a composite measure that encompasses both the quantity and the type of technological activity. OECD database includes a list of a number of patent applications

filed under PCT per country per year based on 35 technology domains grouped in 6 technology fields. All 35 technology domains were used to calculate yearly Herfindahl index for the period 1980-2018. Firstly, shares of patents in particular technology domains in total patents were calculated for each technology domain. Secondly, shares were approximated using a Herfindahl index based on the following formula¹:

$$HHI = s_1^2 + s_2^2 + s_3^2 + \dots + s_{35}^2$$

where s_i is the share of patents in a particular technology domain in total patents using 35 technology domains. Greater concentration of a particular technology domain is shown as higher HHI. International cooperation based on international co-patenting activities is a patent application filed under PCT where at least one inventor from a country different than the country in which a patent applicant or inventor resides (Carayol & Roux, 2007; Guan & Chen, 2012). Hence, this study approximates international cooperation based on yearly international co-patenting activities for the period 1980 – 2018 per country. Data were obtained from the OECD database. GDP and R&D expenditure were used as control variables in the model. Namely, greater the size of the country's GDP, more diversified portfolio of technology of a country. Similarly, greater size of the R&D expenditure reflects a more diversified technology portfolio and, hence, less technology specialization.

RESULTS

Data is obtained for the period between 1980 and 2018, and includes the 37 OECD countries' patent applications and a model is estimated using a log-log form. Descriptive statistics of the variables are present in Table 1.

Table 1. Descriptive statistics of variables

	LOG PCT SCOPE	LOG INT CO-PCT	LOG GDP	LOG R&D EXPENDITURE
Mean	-2.65	2.96	5.51	3.79
Median	-2.91	3.02	5.46	3.82
Maximum	0.00	4.61	7.28	5.74
Minimum	-3.36	-0.18	3.95	1.62
Std. Dev.	0.72	0.86	0.66	0.79
Skewness	2.03	-0.67	0.08	-0.00
Kurtosis	6.77	3.67	2.91	2.80
Jarque-Bera	1679.41	119.95	1.71	1.86
Probability	0.00	0.00	0.43	0.39
Sum	-3476.24	3768.08	7 091.35	4 054.68
Sum Sq. Dev.	681.98	940.84	554.22	671.72
Observations	1314	1275	1287	1070

Source: Authors' calculations

¹ All the formulas are well generated in econometrics.

Basic cross-country panel OLS regression model is presented in Equation 1.

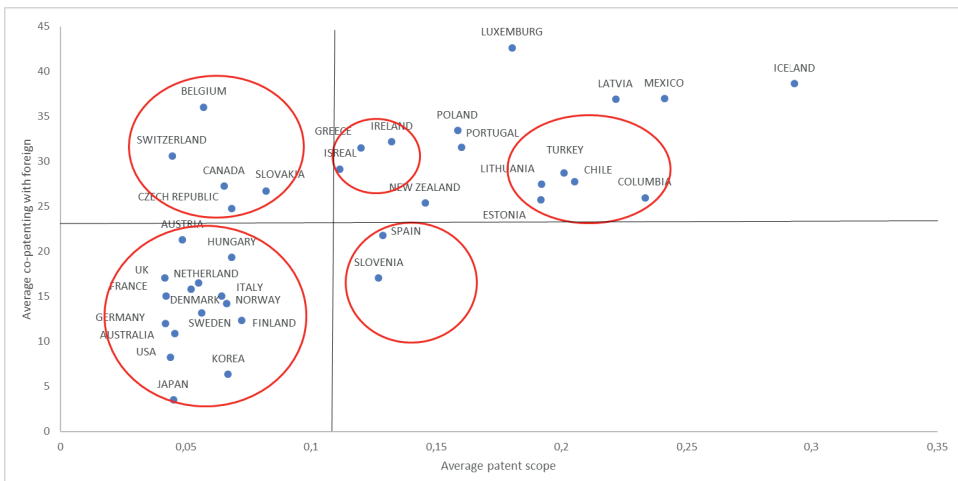
$$\log y_{it} = \beta_1 + \beta_2 \log x_{it2} + \dots + \beta_k \log x_{itk} + \varepsilon_{it}$$

$$i = 1, 2 \dots N \quad t = 1, 2, \dots T \quad (1)$$

where y_i is a dependent variable, x_i is an independent variable, β_1 is a constant, β_2 is a regression coefficient, i, t are indices for individuals and time and ε is an error term. Assumptions of the model are error terms that are independently and identically distributed with expected value 0 and a constant variance.

However, set of countries could be interdependent (Figure 1.). Figure 1 positions each country on a patent scope and international co-patenting plane illustrating the possible cross-sectional dependence. Appendix 1 portrays the similar rationale.

Figure 1. Average patent scope – average international co-patenting plane



Source: Authors' estimations

Breusch-Pagan LM ($p < 0.05$) showed that we cannot reject the hypothesis that there is correlation between cross-sections. As heteroskedasticity and cross-sectional dependence could cause the estimators obtained from panel analysis to be inconsistent, panel analysis should be conducted in a manner to account for possible inconsistencies. Sarafidis and Wansbeek (Sarafidis & Wansbeek, 2012) provide an overview of techniques with large number of units (N) in a lot of observations over time (T) and link a concept of cross-sectional dependence to the spatial and factor structure approaches. When T is fixed and N is large, cross-sectional dependence can be modelled using the seemingly unrelated regression method (SUR) proposed by Zellner (Zellner, 1962). Moreover, this approach is to be used when $T > N$. Therefore, this analysis was performed by estimating generalized least square (EGLS) and running the panel data regression with cross-section weights.

$$\log y_{it} = \beta_1 + \beta_i \log \mathbf{x}'_{it} + \varepsilon_{it} \\ i = 1, 2 \dots N \quad t = 1, 2, \dots T \quad (2)$$

where y_i is a dependent variable, x_i is a independent variable, β_1 is a constant or individual specific effect, β_2 is a $p \times 1$ vector of unknown coefficients, x_{it} is a $p \times 1$ vector of explanatory variables on the i th cross-sectional unit at time t , and ε is an error term. It results in feasibly generalized least squares estimator in which OLS is conducted to each individual – specific equation to get consistent estimators $\{\beta_i\}_{i=1}^N$ used to compute the residuals $\{\hat{e}_{it}\}_{1 \leq i \leq N, 1 \leq t \leq T}$ employed to estimate the covariance between units i and j using $\frac{1}{T} \sum_{t=1}^T \hat{e}_{it} \hat{e}_{jt}$ in the first stage, while the coefficient estimators are obtained using the generalised least squares with the inverse of the estimated covariance matrix as a weighting matrix in the second stage.

Results of the unbalance panel approximated seemingly unrelated regression with cross-section weights is presented in Table 2.

Table 2. Cross-country panel regression for OECD, 1980-2018

Dependent variable	Log PCT SCOPE			
Indep. variable/Model				
Constant	-3.77*** (0.01)	-1.39*** (0.02)	-1.62*** (0.02)	-2.16*** (0.03)
log INT COPCT	0.36*** (0.00)	0.18*** (0.00)	0.07*** (0.00)	0.06*** (0.00)
log GDP		-0.34*** (0.00)		0.21*** (0.01)
log RD expenditure			-0.36*** (0.00)	-0.52*** (0.02)
Adjusted R-squared	0.90	0.92	0.91	0.92
S.E. of regression	0.83	0.83	0.80	0.79
Prob. (F-statistic)	0.00	0.00	0.00	0.00
Mean dependent variable	-2.73	-3.76	-13.34	-14.87
S.D. dependent variable	21.53	28.29	21.76	25.11
Durbin -Watson	1.48	1.48	1.39	1.28
Observations	1275	1211	1047	1015

Note: Standard errors in parentheses. Statistical significance: * <0.10 ; ** <0.05 ; *** <0.01 .

Source: Authors' calculations

Cross-section dependence Breusch-Pagan LM test ($p > 0.05$) showed that we can accept the hypothesis stating no correlation at conventional significance levels. Table 2 shows that international co-patenting positively influences country's technology specialisation at the 1% significance level. As we have expected, the effect of international co-patenting on country's technology specialisation is lessened when the model includes GDP and R&D expenditure.

DISCUSSION AND CONCLUSION

This paper addresses a crucial domain of country technology portfolio. Focusing on homogeneity and heterogeneity of technology, it directs significant attention to a level of countries technology concentration. In order to sustain its competitive position, constant progress in innovation activities is of a paramount importance. Technology portfolio has to be characterized with radical innovation rising from re-combinations of heterogeneous knowledge, as well as with breath, deep understanding of knowledge achieved with homogeneous knowledge recombination. According to De Noni, Ganzaroli & Orsi (De Noni, Ganzaroli, & Orsi, 2017) a perfect balance is desirable.

As international collaboration provides a whole new perspective for partners in innovation process, it is a mean for knowledge extraction. Collaboration provides partners with access to partner specific knowledge and resources. However, variety doesn't mean compatibility. Despite a variety of knowledge that could lead towards a high possibility of radical innovations, one has to be aware that knowledge from abroad might be country-specific and with that difficult to use in a domestic environment. A downside of international knowledge comes from often huge technological distance between partners in the innovation process (Gilsing, Nooteboom, Vanhaverbeke, Duysters, & van den Oord, 2008). Distance makes mutual understanding and communication between partners difficult (Enkel, Groemminger, & Heil, 2018). In order to mitigate this problem partners tend to collaborate over a long time period (Heimeriks, Duysters, & Vanhaverbeke, 2007), thereby enabling filtering incompatibility. Long term international collaboration develops absorptive capacity, namely knowledge acquisition, while calculating for the risks of technological distance (Bröring & Leker, 2007). Specifically, a low level of absorptive capacity enables a search towards familiar international partners and does not incite a search for unfamiliar ones. Following a capability-based view, this paper advocates a national strategy for concentrating on core competences and technology fields in which they achieve best results. Concentrating on technological knowledge in a small number of fields, homogeneous knowledge alleviates portfolio synergy. Furthermore, focusing on patents in a small number of patent fields enables a protection of national core competences and restrains potential entrants to those technology fields. Specialization is, however, followed by a significant downside of technology lock-in. Problem of technology lock-in should not be disregarded as it leaves a country inflexible for fast changing technological trends.

Countries' technological overview was a topic of numerous studies. However, how variety of international knowledge frames country's technology portfolio is a relatively unexplored field. This paper introduces a novel approach for predicting future technological directions. It emphasizes the importance of knowledge globalization and global researchers' interdependence in countries technology foresight. Hence, directing policymakers toward supporting international research projects initiatives. In other words, it emphasizes the importance of a country's technology open-mindedness while defining institutional environment. Finally, private companies possess 85% of countries' international technology collaboration, making technology managers important for countries' technological environment and community. Results indicate that they are leading country toward technology specialization and consequently in a direction of more incremental innovation. This might lead toward decreasing of radical technolo-

gy breakthroughs. Managers should be coordinated with policymakers while framing country technology strategy.

This study has some limitations, especially in relation the methodological approach adopted. This study encompasses all OECD members countries. Herein, the level of technological development among countries differs. Furthermore, countries have different technology scope and patent practice differs between technological fields. Concentration measurement index is often criticized as a static measure, implying a lack of dynamics of a diversification process (Chen, Jang, & Wen, 2010). Furthermore, according to Garcia-Vega (Garcia-Vega, 2006), HHI index can be biased downwards in a case of companies with small scale of technological activities.

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ZNAČAJ DRUŠTVENE ODGOVORNOSTI U POSLOVNOM SEKTORU BOSNE I HERCEGOVINE

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Sažetak: Zbog koristi za sve dionike, društveno odgovorno poslovanje (DOP) je koncept koji postaje sve popularniji te predstavlja sastavni dio poslovanja u suvremenom svijetu. Primjenom DOP-a, poslovni sektor doprinosi održivom razvoju i tvrtke ga koriste kao svoju konkurentsku prednost, jer predstavlja ne samo poželjan već i nužan oblik ponašanja u svim poslovnim aktivnostima. Cilj ovog rada je istražiti razinu provedbe politika DOP-a u malim, srednjim i velikim tvrtkama koje posluju u Bosni i Hercegovini (BiH). Instrument istraživanja je prilagođen za potrebe istraživanja primjene određenih politika DOP-a: politika vezanih za zaposlenike, politika zaštite okoliša, politika sudjelovanja na tržištu i politika koje se odnose na lokalnu zajednicu. U istraživanju poslovnih politika vezanih uz DOP, obuhvaćeni su i standardi koji se odnose na praksu provođenja DOP-a. Za potrebe istraživanja prikupljeni su podaci od 90 tvrtki koje posluju u BiH. Prikupljanje primarnih podataka provedeno je tehnikom online anketnog ispitivanja. Na temelju provedenog istraživanja proizlazi kako poduzeća u BiH, bez obzira na veličinu poduzeća, u svom poslovanju primjenjuju određene oblike društveno odgovornih politika. Analiza je također utvrdila kako kompanije u BiH pridaju različitu važnost pojedinim politikama društveno odgovornog poslovanja. Ipak, može se zaključiti da kompanije u BiH implementiraju određene politike društveno odgovornog poslovanja. Na temelju rezultata istraživanja rad daje pregled politika DOP-a u BiH te nudi određene smjernice implikacije za menadžere, kao i smjernice za buduća istraživanja na temu DOP-a.

Ključne riječi: Društveno odgovorno poslovanje; politike društveno odgovornog poslovanja; standardi društveno odgovornog poslovanja; društveno odgovorna poslovna praksa.

JEL klasifikacija: L21, M14, M21.

UVOD

Može se reći da ideje i koncepti društvene odgovornosti poslovanja (u nastavku DOP) nisu nastali primarno kao rezultat razvoja društvenih znanosti, nego su nastale kao posljedica realnih povijesnih, društvenih i ekoloških problema s kojima se suočava suvremeno društvo (Letica, 2010). U teoriji, kao i u poslovnoj praksi, postoje dva osnovna suprotstavljena pristupa o odgovornostima poslovanja. Prvi pristup polazi od Milтона Friedmana i sadržan je u stajalištu kako je jedina odgovornost poslovanja stvaranje profita dioničarima koliko je god moguće, bez kršenja svakodnevnih moralnih ispravnosti. Drugo stajalište o odgovornosti poslovanja sadržano je u pristupu Roberta Edwarda Freemana, koji zastupa tezu kako je odgovornost poslovanja odgovornost za sve dionike. Dionik, kao svaka osoba, skupina ili organizacija koja ima interes od poslovanja ili je pod utjecajem istog, nameće se kao jedan od ključnih pojmova suvremenog koncepta DOP-a. Dionička teorija, čije je temelje postavio Robert Edward Freeman imala je snažan utjecaj na razvoj pristupa vezanih uz teoriju i praksu poslovne etike i DOP-a. Sa stajališta dioničke teorije, može se reći kako se ona odrazila na suvremeno poimanje koncepta DOP-a, kao i na razmatranje utjecaja poslovanja na društvo u cjelini.

Svrha ovog istraživanja je uvidjeti u kojoj mjeri se praksa DOP-a primjenjuje u poslovanju Bosanskohercegovačkih poduzeća, kao i analizirati značaj pojedinih politika DOP-a. Cilj rada je utvrditi značaj društveno odgovornih praksi bosanskohercegovačkih poduzeća, preciznije određenih politika DOP-a, posebno sa stajališta politika vezanih za zaposlenike, zaštitu okoliša, sudjelovanja na tržištu i politika koje se odnose na lokalnu zajednicu. Hipoteza rada sadrži tvrdnju: U poslovanju bosanskohercegovačkih poduzeća ne postoji strateški pristup u primjeni DOP-a.

PREGLED LITERATURE

Razdoblje 1960-ih i 1970-ih godina dvadesetog stoljeća, obično se naziva dobom aktivizma u kojem se civilno društvo i različiti pokreti nameću kao važni subjekti utjecaja na društvena zbivanja. U tom se vremenskom periodu aktualiziraju brojna pitanja poput građanskih prava, sigurnosti radnih mjesta, problema okoliša, pitanja prava i zaštite potrošača, te dolazi i do same promjene poimanja pojma koncepta društvene odgovornosti poslovanja (Čutura, 2016). Tijek razvoja društvene odgovornosti, kao koncepta poslovanja, *išao je postepeno i u više faza*. Jedan od prvih koraka primjene se ogleda kroz filantropiju (donacije, volontiranje zaposlenika i slično), potom slijedi faza koja je uključivala društvenu odgovornost kao dio dugoročne poslovne strategije, dok je novija generacija društvene odgovornosti posvećena pitanjima siromaštva, socijalne ugroženosti, uništavanja socijalne i životne sredine i sličnim etičnim i moralnim pitanjima. Koncept društvene odgovornosti nadilazi zakonske propise i norme i djeluje na dobrovoljnoj osnovi (Vrdoljak Raguž & Hazdovac, 2014). Suvremeni koncept DOP-a može se opisati kroz više komplementarnih pojmova: održivi razvoj, etično poslovanje, korporacijsko građanstvo i koncept trostrukog učinka (Bagić, Škrabalo, & Narančić, 2006, str. 9). Društveno odgovorna tvrtka integrira društvene i ekološke teme u svoje osnovne poslovne aktivnosti i djeluje odgovorno prema svojim zaposlenicima, potrošačima, okruženju, dobavljačima, lokalnoj zajednici, dioničarima i društvu u cjelini (Öberseder, Schlegelmilch, & Murphy, 2013).

Prethodno navedeni aspekt suvremenog koncepta društveno odgovornog poslovanja ukazuje na potrebu šireg razumijevanja društveno odgovornih praksi poduzeća,

usmjerenih prema svim dionicima, što je ključno u razumijevanju novog pristupa društvenoj odgovornosti i održivosti. Godine, 2011., pozivajući se na potrebu modernog razumijevanja DOP-a i novog plana djelovanja, EU je ažurirala svoju definiciju gdje se DOP definira kao “odgovornost poduzeća za njihov utjecaj na društvo”. Preciznije, tvrtke mogu postati društveno odgovorne integrirajući društvenu, ekološku, etičku dimenziju kao i brigu za potrošače i ljudska prava u svoju poslovnu strategiju i poslovanje. U svrhu postizanja ciljeva održivog razvoja, brojne međunarodne organizacije nastoje utjecati na privatni sektor primičući aktivnosti društveno odgovornih praksi u poslovanju. Tako primjerice Ujedinjene nacije promoviraju kodekse ponašanja poduzeća na području radnih odnosa, ljudskih prava i zaštite okoliša, poznatih pod nazivom Global Compact.¹ Međunarodna organizacija rada (ILO) izradila je smjernice za poslovanje velikih multinacionalnih kompanija koje se kao i OECD-ove smjernice u velikoj mjeri bave zaštitom prava radnika i zaštitom ljudskih prava. Također, u svijetu postoje i određeni standardi i oznake koji označavaju prakse DOP-a. Tako, Međunarodna organizacija za standardizaciju (ISO) u svome standardu ISO 26000 daje dobrovoljne upute o društvenoj odgovornosti svim tipovima organizacija, bez obzira na vrstu, veličinu i djelatnost kojom se bave, ISO 14000 se odnosi na sustave upravljanja okolišem. Proizvodi s oznakom Fairtrade znači da su proizvođači i tvrtke ispunili međunarodno dogovorene standarde koji su neovisno certificirani. Na važnost društveno odgovornih inicijativa ukazuju i empirijski dokazi tako na primjer društveno odgovorne inicijative, pod određenim uvjetima, mogu utjecati na namjeru kupnje proizvoda određene tvrtke (Sankar & C. B., 2001), ili poboljšati korporativne performanse i vrijednost tvrtke (Cho, Chung, & Young, 2019). Bitno je naglasiti kako je u poslovnoj praksi vidljiv pomak od društvene odgovornosti poslovanja, shvaćene kao obaveze davanja društvu, do davanja društvu kao izabranoj strategiji poslovanja (Kotler & Lee, 2011).

Razmatrajući teorijski koncept društvene odgovornosti, njegova uloga djeluje jasna i primjenjiva. Ipak radi se o relativno novom konceptu, posebno za zemlje u razvoju. Praksa društvene odgovornosti vrlo je raznolika i uvelike ovisi o kontekstu u kojem se događa, o potrebama poduzeća, o upravljačkoj praksi i korporacijskoj kulturi poduzeća, o tradiciji pojedine zemlje i mnogim drugim čimbenicima (Vrdoljak Raguž & Hazdovac, 2014). Ako se promatra DOP u BiH, malo je istraživanja u čijem je fokusu ovaj koncept (Čavalić & Bećirović, 2017). Najveći izazov za razvoj DOP-a u BiH predstavlja nedostatak politika, legislative i standarda relevantnih za koncept DOP-a u BiH (Čatić-Kajtažović, 2011). Na temelju provedenog istraživanja turističkog sektora poduzeća u BiH, rezultati pokazuju da je kolektivna svijest o DOP-u daleko od potrebne; ali da se može nagovijestiti da se svijest poduzeća mijenja u pozitivnom pravcu (Čekrlija & Pavlović, 2012). Bosanskohercegovačka poduzeća uglavnom DOP shvaćaju kao filantropiju, donacije, dobro definirane strategije zapošljavanja ili poslovanje u okviru zakonskih normi (Čatić-Kajtažović, 2011). Rezultati istraživanja Čavalića i Bećirovića (2017) su potvrdili da kompanije u BiH slijede hijerarhiju društvene odgovornosti predstavljenu Carrollovom (1991) piramidom društvene odgovornosti (ekonomska, zakonska, etička i filantropijska dimenzija). Najveći postotak suglasnosti

¹ Globalni dogovor Ujedinjenih naroda najveća je svjetska inicijativa korporativne održivosti. Pokrenut 2000. godine, kao posebna inicijativa glavnog tajnika UN-a. Temelji se na deset principa podijeljenih u četiri cjeline: ljudska prava, radi uvjeti, okoliš i anti-korupcija (vidjeti više na: <https://www.unglobalcompact.org/>)

je vezan za izjave u vezi s ekonomskom odgovornošću tvrtke (poslovanje, stvaranje profita, ispunjavanje potreba kupaca). Prema autorima, tvrtke bi trebale više raditi na prelasku na više kategorije društvene odgovornosti, poput etičke i filantropske odgovornosti (Čavalić & Bećirović, 2017).

Prema navedenom istraživanju, ekonomska odgovornost je osnovna odgovornost tvrtki u BiH, ali da bi se išlo u korak sa trenutnim svjetskim trendovima, potrebno je raditi na poboljšanju drugih dimenzija i područja DOP-a. Ako se promatra zakonska regulativa, u BiH ne postoji obaveza gospodarskih subjekata da dio svoje dobiti usmjeravaju u ostvarenje društvenih ciljeva. Društveno odgovorno poslovanje kao rezultat striktnih odredbi zakona se podrazumijeva za gospodarske subjekte, ali ih to ne opredjeljuje kao filantropsku aktivnost i sama privredna društva su slobodna da odlučuju o tome da li će poslovati legalno, pa samim tim i društveno odgovorno u smislu zakona (Grbo, 2018).

Prema podacima Eurobarometra², koji kontinuirano provodi analizu javnog mišljenja unutar Europskih zemalja, rezultati ukazuju na različitost u poimanju društveno odgovornih praksi u poslovanju na nacionalnoj i regionalnoj razini. Budući da je u BiH vrlo malo istraživanja u čijem je fokusu koncept DOP-a (Čavalić & Bećirović, 2017), cilj ovog rada je daljnji doprinos boljem razumijevanju DOP-a u Bosni i Hercegovini iz perspektive donositelja poslovnih odluka, odnosno menadžmenta. U istraživanju potrošača, kao dionika, dimenzije odgovornosti iz Carrollove piramide društvene odgovornosti poduzeća, oni daju prioritet filantropskoj odgovornosti (Čatić-Kajtažović & Šumar, 2020). S druge strane, autori ukazuju na potrebu daljnje analize važnosti pojedinih dimenzija društvene odgovornosti za ostale dionike, između ostalih, za menadžment poduzeća u cilju boljeg razumijevanja i uvida u važnost određenih dimenzija društvene odgovornosti u BiH. S obzirom da su dosadašnja istraživanja uglavnom temeljena na Carrollovom modelu podjele DOP-a na četiri dimenzije, budući da one ne sadrže dimenziju okoliša, cilj ovoga rada je detaljniji uvid i bolje razumijevanje pojedinih aspekata odgovornosti poslovanja poduzeća prema, okolišu, zaposlenicima, lokalnoj zajednici i ekonomskim aspektima sudjelovanja na tržištu, po uzoru na suvremeni pristup definiranju DOP-a. Sličan pristup primjenjuju autori Mandl i Dorr (2007), koji smatraju da su glavna područja DOP-a aktivnosti usmjerena na četiri kategorije dionika: radna mjesta - zaposlenici, zajednica, okoliš i tržište, uključujući kupce i poslovne partnere (Moisescu, 2014).

Prema novijim izvorima, istraživanja o praksama DOP-a uglavnom se fokusiraju na veća poduzeća (Dias, Rodrigues, Craig, & Neves, 2018). S obzirom da općenito nedostaje akademskih istraživanja vezanih uz DOP malih i srednjih poduzeća, posebno u dijelu pitanja koja se odnose na aspekte održivosti, te budući da je glavnina istraživanja stavila naglasak na velike korporacije i uglavnom zanemarila mala i srednja poduzeća, daljnja istraživanja o tome kako se mala i srednja poduzeća mogu nositi s izazovima DOP-a i istodobno ostati profitabilna predstavljaju dodatni izazov (Murphy, 2013). Upravo je navedeno jedan od motiva za provođenje ovog istraživanja praksi DOP-a u bosanskohercegovačkim poduzećima jer slične analize do sada nisu rađene.

² Eurobarometer je serija istraživanja uglavnom provedenih od strane Evropske komisije počevši od 1973. godine. Eurobarometer anketama mjeri javno mišljenje u svim državama članicama EU, kao i u zemljama kandidatima (vidjeti više na stranici: <https://www.euromonitor.com/>)

METODOLOGIJA

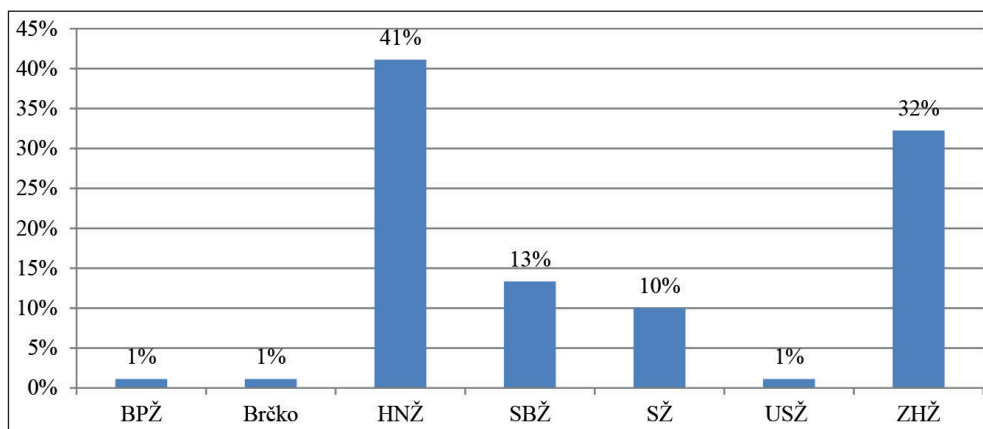
Za ovo istraživanje korišten je strukturirani upitnik podijeljen u dva dijela. Prvi dio upitnika se odnosi na osnovne podatke o samom poduzeću, sastoji se od pet pitanja nominalnog karaktera od kojih su četiri pitanja sa ponuđenim odgovorima i jednim otvorenim pitanjem. Drugi dio upitnika se odnosi na pitanja vezana za društveno odgovorno poslovanje i sastoji se od devet pitanja s pripadajućim listama tvrdnji. Dio upitnika koji se odnosi na politike DOP-a je mjeran Likertovom skalom i prilagođen prema anketnom upitniku koji je razvijen od strane Europske komisije za podizanje svijesti o DOP-u³, koji je uz određene transformacije već korišten u sličnim istraživanjima (Moisescu, 2014). Pored toga, dva pitanja mjerena Likertovom skalom su dodana od strane autora koja se tiču načina odlučivanja o sponzorstvima i donacijama u svrhu potpore aktivnostima i projektima lokalne zajednice i stupnju financijskih ulaganja u pojedina područja/ programe/ ustanove od interesa društva. Pored opisanog, tri pitanja nominalnog karaktera su također uključena u analizu a tiču se posjedovanja etičkog standarda, primjene određenih standarda DOP-a i načina određivanja budžeta za aktivnosti DOP-a. Online anketno ispitivanje izvršeno je putem Google Obrasca (eng. Google Forms). Istraživanje je provedeno tijekom svibnja do kolovoza 2020. godine, preko profesionalne mreže LinkedIn. Upitnici su u elektronskoj formi poslani menadžerskom osoblju u tvrtkama, vodeći se time da to osobe koje donose odluke o društveno odgovornim inicijativama. U popratnim uputama, jasno je svim sudionicima garantirana anonimnost. Tijekom razdoblja od svibnja do kolovoza 2020. podijeljeno je ukupno 150 upitnika, a 94 je popunjeno i vraćeno, od čega je 4 neupotrebljivo sa stopom povrata od oko 62%. Stupanj slaganja s ponuđenim tvrdnjama anketnog upitnika mjerio se pomoću Likertove skale od 1 do 5. U radu se još analizira i razlika u postignutim srednjim vrijednostima pojedinih inicijativa DOP-a odgovornosti s obzirom na veličinu tvrtke gdje su poduzeća, zbog malog uzorka, u cilju veće pouzdanosti t-testa, podijeljena u dvije skupine s obzirom na broj zaposlenika.⁴ Prvu skupinu čine mikro i mala poduzeća (0-49 zaposlenih), drugu skupinu čine srednja i velika poduzeća (preko 50 zaposlenih). Rezultati su analizirani u programu SPSS (verzija 21) korištenjem deskriptivne statistike i t-testom neovisnih uzoraka.

REZULTATI EMPIRIJSKOG ISTRAŽIVANJA

Iz regionalnih karakteristika uzorka je jasno kako je više od polovine poduzeća iz uzorka smješteno u dvije županije, Hercegovačko-neretvanskoj i Zapadno-hercegovačkoj, što rezultira određenim iskrivljenjem podataka s obzirom na regiju (Grafikon 1).

³ Upitnik je razvijen od strane Europske komisije od 2005. godine, zadnju verziju koja je korištena u radu je moguće preuzeti na stranici: <http://ec.europa.eu/DocsRoom/documents/10369/attachments/1/translations>, pristupljeno 08.04.2020. godine.

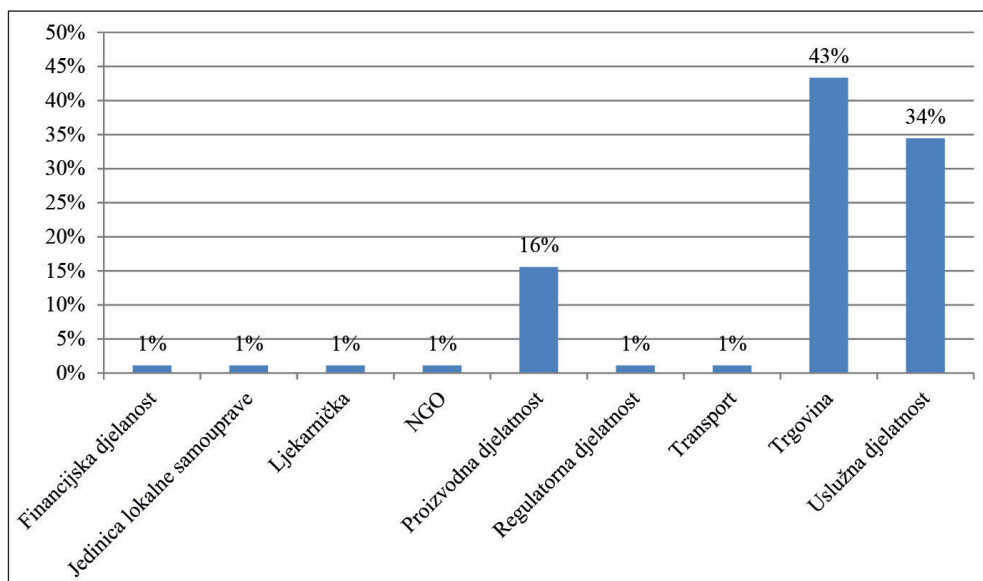
⁴ Prema preporuci Europske komisije mikro poduzeća imaju manje od 10 zaposlenika, mala poduzeća imaju manje od 50 zaposlenika, srednja poduzeća imaju manje od 250 zaposlenika.



Grafikon 1. Županije u kojima posluju poduzeća obuhvaćena ispitivanjem

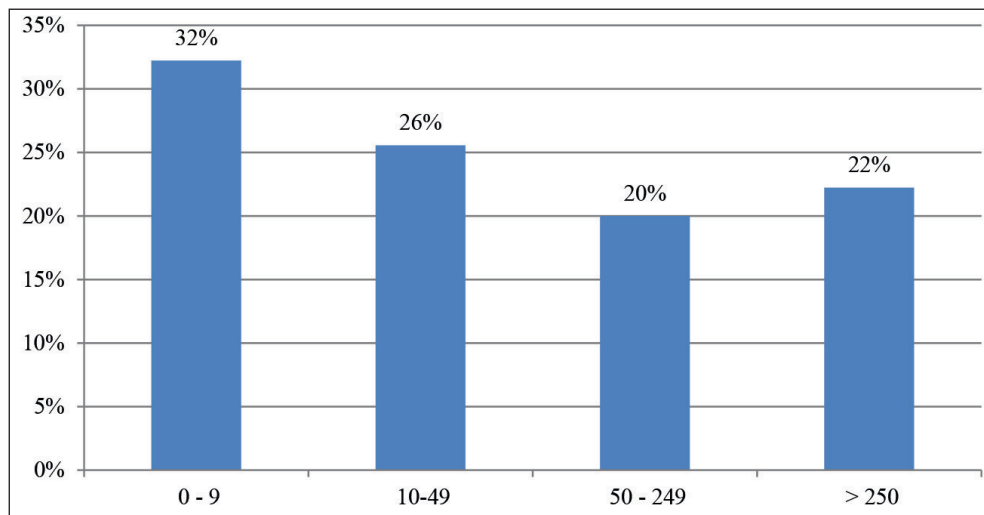
Izvor: Izrada autora na temelju provedenog istraživanja

Velika većina poduzeća u uzorku su u privatnom vlasništvu, 86,6%, i to većinom društva sa ograničenom odgovornošću, 88,8%. Sljedeći grafikoni prikazuju sektore u kojima posluju poduzeća čiji menadžeri su obuhvaćeni anketnim ispitivanjem (Grafikon 2.), te veličinu poduzeća, odnosno broj zaposlenika (Grafikon 3.)



Grafikon 2. Sektori u kojima posluju poduzeća čiji menadžeri su obuhvaćeni anketnim ispitivanjem

Izvor: Izrada autora na temelju provedenog istraživanja



Grafikon 3. Broj zaposlenika poduzeća u kojima rade anketirani menadžeri

Izvor: Izrada autora na temelju provedenog istraživanja

U cilju jasnijeg uvida u pridavanje značaja određenim dimenzijama DOP-a, u narednoj tablici (Tablica 1.) je prikazana deskriptivna statistika analiziranih tvrdnji koji se tiču pojedinih politika DOP-a: politike prema zaposlenicima (četiri indikatora - Zap), okolišu (četiri indikatora - Okol) lokalnoj zajednici (četiri indikatora - LZ) i ekonomskim aspektima sudjelovanja na tržištu (tri indikatora - Ekon).

Tablica 1. Analiza srednjih vrijednosti u cilju utvrđivanja značajnosti pojedinih dimenzija DOP

	Rang	M	SD	Dim
Poslovanje poduzeća omogućuje pravovremeno plaćanje računa dobavljača.	1	4,56	0,89	Ekon
Poduzeće evidentira i rješava pritužbe kupaca, dobavljača i poslovnih partnera.	2	4,44	0,88	Ekon
Poduzeće prakticira politiku pravednosti u svim svojim ugovorima, odnosima i oglašavanju	3	4,21	0,99	Ekon
Savjetujemo se sa našim zaposlenicima o nekim pitanjima vezanim uz poslovanje.	4	4,04	1,05	Zap
U svom poslovanju se trudimo minimizirati i reciklirati otpad.	5	4,02	1,08	Okol
Potičemo svoje zaposlenike u razvijanju vještina i dugoročne karijere	6	3,94	1,04	Zap
Nastojimo umanjiti negativan utjecaj poslovanja u smislu sprječavanja zagađenja	7	3,92	1,15	Okol
Postoji procedura kojom se osigurava da se poduzmu adekvatni koraci protiv svih oblika diskriminacije, kako na radnom mjestu tako i prilikom zapošljavanja	8	3,88	1,23	Zap
Poduzeće se trudi kupovati od lokalnih proizvođača/ dobavljača.	9	3,87	1,24	LZ

Nastojimo umanjiti negativan utjecaj poslovanja na okoliš uštedom energije.	10	3,80	1,22	Okol
Poduzeće redovito pruža financijsku potporu aktivnostima i projektima lokalne zajednice	11	3,78	1,26	LZ
Poduzeće pruža jasne i točne podatke o utjecaju proizvoda, usluga i aktivnosti na okoliš.	12	3,78	1,18	Okol
Poduzeće aktivno nudi dobru ravnotežu radnog i privatnog života za svoje zaposlenike.	13	3,44	1,28	Zap
Tvrtka nudi mogućnosti obuke za ljude iz lokalne zajednice.	14	3,43	1,32	LZ
Ohrabrujemo svoje zaposlenike da volonterski sudjeluju u aktivnostima i projektima lokalne zajednice.	15	3,34	1,32	LZ

Izvor: Izrada autora na temelju provedenog istraživanja

U području analize inicijativa društveno odgovornog poslovanja u Tablici 2. su vidljivi rezultati T-testa u ovisnosti od veličine samog poduzeća. Poduzeća su kako je ranije pojašnjeno grupirana u dvije skupine: mikro i mala poduzeća (0-49 djelatnika) i srednja i velika poduzeća (preko 50 djelatnika).

Tablica 2. Razlike u primjeni praksi DOP-a ovisno o veličini poduzeća prema broju zaposlenih

Q		N	M	SD	p<0,01**
Q1-Potičemo svoje zaposlenike u razvijanju vještina i dugoročne karijere	0-49	52	3,90	1,05	,668
	>50	38	4,00	1,04	
Q2-Postoji procedura kojom se osigurava da se poduzmu adekvatni koraci protiv svih oblika diskriminacije, kako na radnom mjestu tako i prilikom zapošljavanja	0-49	52	3,77	1,35	,328
	>50	38	4,03	1,03	
Q3-Poduzeće aktivno nudi dobru ravnotežu radnog i privatnog života za svoje zaposlenike	0-49	52	3,75	1,17	,007**
	>50	38	3,03	1,33	
Q4-Savjetujemo se sa našim zaposlenicima o nekim pitanjima vezanim uz poslovanje.	0-49	52	4,29	0,94	,009**
	>50	38	3,71	1,11	
Q5-Tvrtka nudi mogućnosti obuke za ljude iz lokalne zajednice	0-49	52	3,38	1,21	,685
	>50	38	3,50	1,48	
Q6-Poduzeće se trudi kupovati od lokalnih proizvođača/dobavljača.	0-49	52	3,94	1,19	,501
	>50	38	3,76	1,30	
Q7-Poduzeće redovito pruža financijsku potporu aktivnostima i projektima lokalne zajednice	0-49	52	3,62	1,30	,154
	>50	38	4,00	1,19	
Q8-Ohrabrujemo svoje zaposlenike da volonterski sudjeluju u aktivnostima i projektima lokalne zajednice	0-49	52	3,38	1,33	,737
	>50	38	3,29	1,31	
Q9-Nastojimo umanjiti negativan utjecaj poslovanja na okoliš uštedom energije.	0-49	52	3,90	1,21	,348
	>50	38	3,66	1,24	
Q10-U svom poslovanju se trudimo minimizirati i reciklirati otpad.	0-49	52	4,00	1,01	,821
	>50	38	4,05	1,18	

Q11-Nastojimo umanjiti negativan utjecaj poslovanja u smislu sprječavanja zagađenja	0-49	52	3,90	1,18	,861
	>50	38	3,95	1,14	
Q12-Poduzeće pruža jasne i točne podatke o utjecaju proizvoda, usluga i aktivnosti na okoliš	0-49	52	3,69	1,16	,424
	>50	38	3,89	1,20	
Q13-Poduzeće prakticira politiku pravednosti u svim svojim ugovorima, odnosima i oglašavanju	0-49	52	4,15	1,02	,523
	>50	38	4,29	0,96	
Q14-Poslovanje poduzeća omogućuje pravovremeno plaćanje računa dobavljača.	0-49	52	4,56	0,83	,979
	>50	38	4,55	0,98	
Q15-Poduzeće evidentira i rješava pritužbe kupaca, dobavljača i poslovnih partnera.	0-49	52	4,38	0,89	,451
	>50	38	4,53	0,86	

Izvor: Izrada autora na temelju provedenog istraživanja

Pored navedenog, u radu je izvršena i analiza samog donošenja odluke o sponzorstvu, gdje se u Tablici 3. mogu vidjeti koji od načina donošenja odluke poduzeća u BiH preferiraju te razlike u odnosu između mikro/malih i srednjih/velikih poduzeća.

Tablica 3. Donošenje odluke o sponzorstvu ovisno o veličini poduzeća prema broju zaposlenih

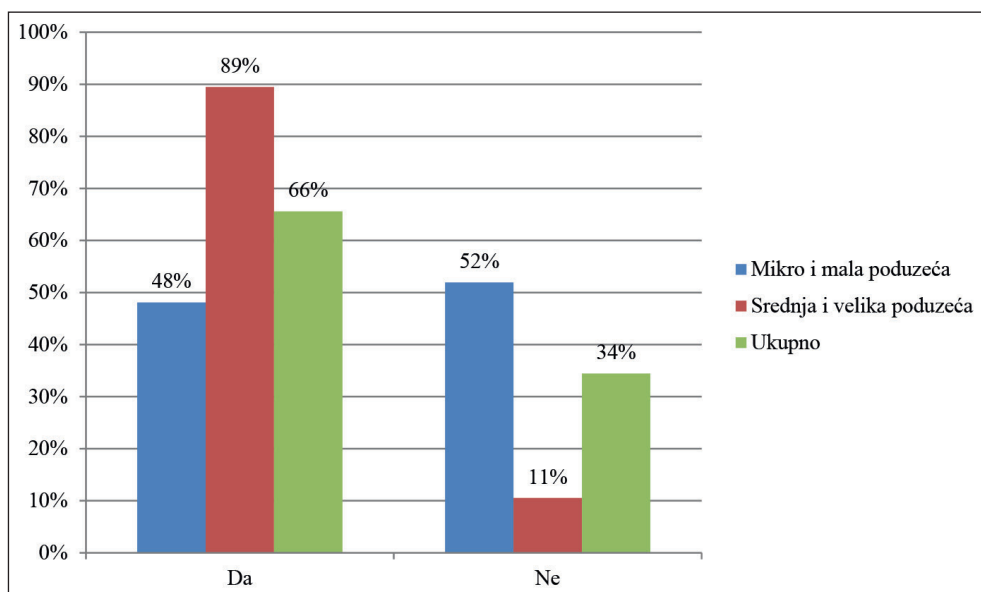
		N	M	SD	p<0,01**
Odlukom o donacijama/sponzorstvu koju donosi Uprava poduzeća ili Direktor	0-49	52	4,17	0,90	,087
	>50	38	3,76	1,34	
Objavom poziva za ulaganje u projekte i aktivnosti lokalne zajednice i razmatranjem istih	0-49	52	2,56	1,42	,487
	>50	38	2,76	1,32	
Razmatranjem pojedinačno zaprimljenih zahtjeva/zamolbi za sponzorstvom/donacijama	0-49	52	3,83	1,15	,651
	>50	38	3,71	1,27	
Odabirom određenih projekata lokalne zajednice koji se uklapaju u vrijednosti našeg poduzeća	0-49	52	3,65	1,23	,701
	>50	38	3,55	1,22	

Izvor: Izrada autora na temelju provedenog istraživanja

U Tablici 4. su vidljivi rezultati analize najčešćeg ulaganja u određene segmente lokalne zajednice ili društva općenito i analizira se značajnost njihovih razlika između mikro/malih i srednjih/velikih poduzeća.

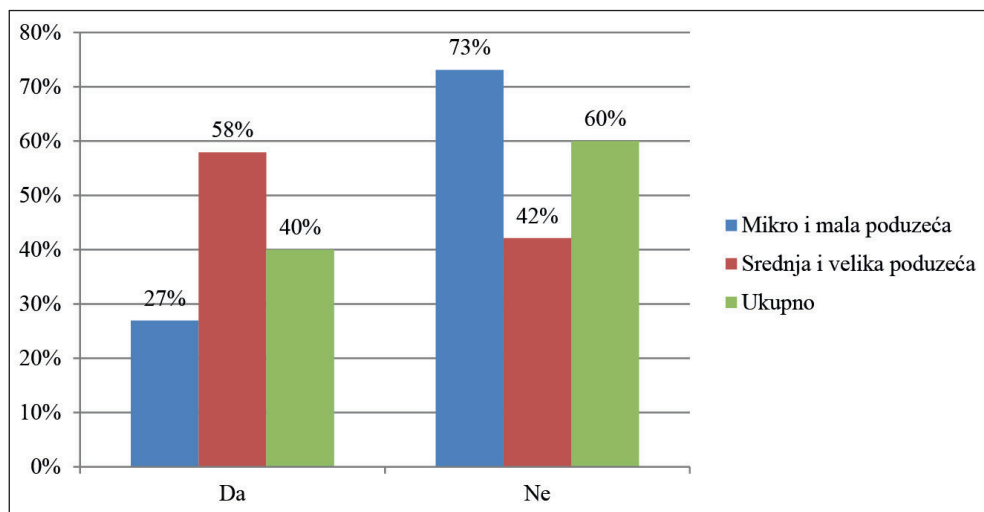
Tablica 4. Ulaganje u pojedine segmente zajednice/društva ovisno o veličini poduzeća prema broju zaposlenih

		N	M	SD	p<0,01**
Sportska natjecanja i klubovi	0-49	52	3,17	1,37	,332
	>50	38	3,45	1,25	
Kulturni i zabavni događaji	0-49	52	3,25	1,20	,878
	>50	38	3,21	1,19	
Obrazovanje	0-49	52	2,98	1,45	,169
	>50	38	3,39	1,33	
Socijalne ustanove	0-49	52	2,92	1,40	,865
	>50	38	2,97	1,38	
Zdravstvene ustanove	0-49	52	2,35	1,44	,372
	>50	38	2,61	1,22	
Donacije pojedincima i grupama u potrebi	0-49	52	3,81	1,25	,148
	>50	38	3,42	1,22	
Unapređenje okoliša i kvalitete života	0-49	52	2,85	1,46	,281
	>50	38	3,16	1,17	
Infrastruktura lokalne zajednice	0-49	52	2,31	1,31	,005**
	>50	38	3,08	1,22	
Stipendiranje	0-49	52	2,37	1,40	,034**
	>50	38	3,03	1,48	

Izvor: Izrada autora na temelju provedenog istraživanja**Grafikon 4.** Usporedba veličine poduzeća i posjedovanja etičkog kodeksa**Izvor:** Izrada autora na temelju provedenog istraživanja

U analizi razlika u etičkoj praksi između mikro i malih te srednjih i velikih poduzeća, u nastavku se može vidjeti usporedba odgovora na pitanje da li poduzeća primjenjuju etički kodeks u svom poslovanju ili ne (Grafikon 4.).

Također, ukoliko se pogleda stupanj primjene određenih normi i standarda DOP-a, kao što su: ISO 26000, SA 8000, IQ Net SR-10, ISO 14000 i/ili drugih, na Grafikonu 5 se mogu vidjeti razlike između mikro i malih te srednjih i velikih poduzeća.



Grafikon 5. Usporedba veličine poduzeća i primjene određenih normi i standarda DOP-a

Izvor: Izrada autora na temelju provedenog istraživanja

REZULTATI ISTRAŽIVANJA, OGRANIČENJA I SMJERNICE ZA BUDUĆA ISTRAŽIVANJA

Promatrajući srednje vrijednosti vezane za razine značajnosti pojedinih dimenzija DOP-a (Tablica 1.), vidljivo je da su najveće srednje vrijednosti vezane za ekonomski aspekt sudjelovanja poduzeća na tržištu kao što je pravovremeno plaćanje računa, rješavanje pritužbi kupaca, dobavljača i slično te su one rangirane kao najznačajnije. Podjednaka važnost se usmjerava na aspekte zaposlenika i okoliša, dok se najmanje pažnje posvećuje angažiranju poduzeća u politikama DOP-a prema lokalnoj zajednici. Navedeno prati slijed postojećih istraživanja DOP-a u BiH gdje je ekonomskoj dimenziji, poduzeća u BiH pridaje najveći značaj, a filantropskoj odgovornosti najmanji (Čavalić & Bećirović, 2017).

Ako se promatra veličina poduzeća, može se zaključiti da u najvećem broju dimenzija ne postoji signifikantna razlika u primjeni različitih politika DOP-a bosanskohercegovačkih poduzeća (Tablica 2.), što se podudara sa rezultatima istraživanja Diasa i suradnika (2018) malih, srednjih i velikih poduzeća u Portugalu. Jedina signifikantna razlika se pronalazi u segmentu zaposlenika gdje mikro i mala poduzeća primjenjuju u značajnijoj mjeri praksu bolje ravnoteže privatnog i radnog života za svoje zaposlenike (u smislu fleksibilnog radnog vremena, rada od kuće, $p=0,007$) te se savjetuju u većoj mjeri sa zaposlenicima o pitanjima vezanim uz poslovanje, u odnosu

na srednja i velika poduzeća koja to čine u manjoj mjeri ($p=0,009$). Moguće je da se navedena razlika javlja zbog same strukture poduzeća i djelatnosti kojom se bave iz praktičnih razloga, budući da je u uzorku znatno veći broj mikro i malih poduzeća koji se primjerice bave uslužnom djelatnosti (51,3%) u odnosu na srednja i velika poduzeća (13%). Navedeno svakako otvara prostor budućih istraživanja u ovom području. Ako se promatra način donošenja odluka o sponzorstvima i donacijama u svrhu potpore aktivnostima i projektima lokalne zajednice (Tablica 3.), ne postoji značajna razlika između mikro i malih te srednjih i velikih poduzeća. Prema rezultatima istraživanja, odluku o sponzorstvu, odnosno donaciji financijskih sredstava, lokalnoj zajednici u najvećem broju slučajeva donosi uprava ili direktor poduzeća, dok najrjeđe poduzeća objavljuje javne pozive za dodjelu sredstava projektima i aktivnostima lokalne zajednice. Također, prema rezultatima (Tablica 4.), ne postoji signifikantna razlika pojedinim ulaganjima u pojedina područja/programe/ustanove od interesa društva. Jedina signifikantna razlika u ovom aspektu se može vidjeti u ulaganja u infrastrukturu lokalne zajednice ($p=0.005$) i stipendiranju (subvencioniranje školovanja studenata ($p=0.034$), gdje prema rezultatima istraživanja prednjače srednja i velika poduzeća. Poduzeća u BiH su najspremnija podržati donacije pojedincima/grupama po potrebi (bolest, liječenje, socijalna ugroženost), potom slijedi ulaganje u sportska natjecanja i klubove, dok su najmanje spremni uložiti u infrastrukturu lokalne zajednice i zdravstvene institucije. Iz prethodno prikazanih rezultata istraživanja vezano za primjenu etičkog kodeksa (Grafikon 4.), vidljivo je kako nešto više od 2/3 poduzeća iz uzorka posjeduju usvojen etički kodeks. Također, vidljiva je velika razlika u primjeni etičkog kodeksa između mikro i malih poduzeća, gdje većina njih (52%) ne posjeduje etički kodeks dok manji dio (48%) posjeduje u odnosu na srednja i velika poduzeća. Velika većina srednjih i velikih poduzeća posjeduje etički kodeks (89%) dok ih malih broj ne posjeduje (11%). Neovisno o relativno visokom udjelu poduzeća koja imaju usvojen etički kodeks, na otvoreno pitanje primjenjuju li u svom poslovanju neku od normi/standarda koje se tiču DOP-a, kao što su: ISO 26000, SA 8000, IQ Net SR-10, ISO 14000 i/ili druge, samo 40% poduzeća primjenjuje neki od standarda, dok 60% njih uopće ne primjenjuje neku od standardiziranih normi koje se tiču DOP-a. I u ovom slučaju je također veći udio srednjih i velikih poduzeća (58%) koja posjeduju određene standarde u odnosu na mikro i mala poduzeća (27%). U istraživanju je otvorenim pitanjem analizirano i na koji način poduzeća određuju budžet za financiranje aktivnosti i projekata, donacija i sponzorstava koji se mogu staviti pod nazivnik društvene odgovornosti te je većina ispitanih predstavnika poduzeća (više od 2/3) odgovorila da se budžet najčešće određuje kao dio od ukupnog budžeta namijenjenog za marketinške aktivnosti poduzeća. Iz distribucije odgovora menadžera jasno je kako ne postoje točno određena područja kao ni planirana sredstva za ulaganje u društvenu odgovornost. Naprotiv, iz nešto više od 1/3 odgovora menadžera može se iščitati kako se radi o ad hoc pristupu područjima ulaganja vezanim uz društvenu odgovornost. Dok je nešto više od 2/3 menadžera dalo odgovor kako su financijska sredstva koja ulažu u programe i područja društvena odgovornosti, zapravo postotni udio financijskih sredstava iz budžeta planiranog za marketing. Navedeni rezultati vezani uz odabir područja DOP-a, usmjeravanje financijskih sredstava u DOP, kao i način odlučivanja, te stupanj primjene normi i standarda ukazuju kako je ulazna pretpostavka, odnosno, hipoteza da poduzeća u BiH nemaju strateški pristup DOP-u u potpunosti potvrđena.

Važno je istaknuti da istraživanje ima i određena ograničenja. Prvo ograničenje predstavlja činjenica da je u istraživanju korišten anketni upitnik koji, pored određenih pitanja o obilježjima samog poduzeća, koristi Likertovu skalu izražavanja stupnja slaganja s ponuđenim tvrdnjama. Pri tome dakle postoji realna opasnost od subjektivne procjene ispitanika što može utjecati na iskrivljenje dobivenih rezultata. U cilju smanjenja ovog ograničenja je jasno u upitniku navedeno svim sudionicima da je anketni upitnik anoniman. Drugo ograničenje se ogleda u veličini uzorka u istraživanju ($N=90$) kao i načinu prikupljanja podataka (online upitnik). Također činjenica je da je većina poduzeća iz dvije regionalne jedinice – županije u BiH, tako da postoji mogućnost da se rezultati iz drugih županija/dijelova BiH, mogu u određenoj mjeri razlikovati. S obzirom da je ljestvica koja je korištena za utvrđivanje značaja politika DOP-a poduzeća u BiH prevedena i prilagođena, svakako se daje preporuka da se ona dodatno testira, proširi ili potvrdi na većem i raznovrsnijem uzorku. Također, budući da je u istraživanju vršena generalna analiza praksi koje poduzeća u BiH primjenjuju, stvara se potreba utvrđivanja prediktora takve prakse kao i različitih utjecaja koje takva praksa ima na poslovanje poduzeća i ostale dionike.

ZAKLJUČAK

Koncept DOP-a, odnosno društvene odgovornosti poslovanja, usporedo s popularnošću u teoriji i praksi, doživljava i određene kritike. U kritici DOP-a najčešće se postavlja pitanje: je li DOP realitet ili rezultat nastojanja tvrtki da kroz odnose s javnošću i marketing predstave svoje poslovanje kao društveno odgovorno? Određeni autori smatraju kako se često u praksi društvene odgovornosti shvaćanje društvene odgovornosti svodi na investiranje u ugled tvrtke ili upravljanje rizikom od gubitka pozitivnog ugleda. Pored razlika koje se pojavljuju u interpretaciji i primijeni koncepta društvene odgovornosti u poslovnoj praksi, u teoriji, također, postoje nesuglasja kako o prirodi samog koncepta tako i o njegovoj primijeni i svrsi. Jedno od temeljnih pitanja koje se postavlja od strane poslovnog sektora, vezano uz primjenu koncepta, glasi: zašto bi poduzeće privatnim novcem podupiralo javne ciljeve i rješavalo javne probleme? S druge strane, postoji i određeni konsenzus, kako u teoriji tako i praksi, da je minimum društveno odgovornog poslovanja sadržan u poštivanju zakonske regulative, te u imperativu ne štetiti zajednici i društvu. Domena koja nadilazi zakonsku regulativu, je sfera razvoja strategijskog pristupa društvenoj odgovornosti. Strategijski pristup, međutim, bitno je povezan i za veličinu i resurse poduzeća, pa je u praksi prisutno, posebno u slučaju mikro i malih poduzeća, ulaganje u pojedina područja društvene odgovornosti, umjesto strategijske implementacije iste. Navedenu tezu podupire i prikazano istraživanje u čijem uzorku su značajnije prisutna mikro i mala te srednja poduzeća, a tek manjim dijelom i velika poduzeća. Iako se radi o relativno malom uzorku i iskrivljenoj regionalnoj distribuciji uzorka, jasno je kako poduzećima u lokalnom okružju nedostaje strategijska orijentacija spram implementacije društvene odgovornosti. Normativno gledano, etički kodeks zadovoljava početnu formu implementacije društvene odgovornosti u poslovnu praksu, ali drugi pokazatelji, kao što su način odlučivanja o područjima ulaganja kao i sama priroda sredstava koja se izdvaja, te priroda programa u koje se ulaže, ukazuju kako se radi o vrlo nerazvijenim formama društveno odgovornog poslovanja u našem okruženju. Kada se uzme u obzir udio sive ekonomije u GDP-u Bosne i Hercegovine, koji u prosjeku doseže i 25%, može

se pretpostaviti kako poduzećima u našem okruženju često nedostaje i minimum, a to je poštivanje zakonske regulative koja se odnosi na poslovanje. Vladine agencije kao i neprofitni sektor bi trebali pružiti potporu poduzećima u provođenju DOP-a putem, primjerice, pružanja različitih usluga, alata i obuka za menadžere i zaposlenike da postanu ekološki i društveno odgovorniji. S druge strane gospodarski subjekti bi trebali povećati napore za potporu provedbi sustava izvješćivanja i certificiranja politika iz domene DOP-a. Nepostojanje značajnih razlika u praksama DOP-a poduzeća u BiH s obzirom na njihovu veličinu i pridavanje najveće važnosti ekonomskim aspektima DOP-a ukazuje na nedovoljno shvaćanje suvremenog pristupa DOP-a od strane menadžmenta. U BiH su brojni pomaci potrebni, kako na institucionalnoj razini tako i na razini poslovne prakse, u smjeru razumijevanja odnosa između poslovanja i društva ali i razumijevanja određenih preduvjeta dugoročne održivosti poslovanja. Mnogi primjeri iz teorije i prakse DOP-a potvrđuju kako je dugoročna održivost poslovanja neizvediva bez šireg sagledavanja okruženja i uspostave ravnoteže između profitnih ciljeva i ciljeva, prije svega, vezanih uz mikro društveno okruženje poslovanja, a potom i makro okruženje poslovanja.

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IMPORTANCE OF SOCIAL RESPONSIBILITY IN BUSINESS SECTOR OF BOSNIA AND HERZEGOVINA

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Summary: *Because of the benefits for all stakeholders, corporate social responsibility (CSR) is a concept that is now becoming increasingly popular and is also an integral part of doing business in the modern world. Through applying CSR, the business sector contributes to sustainable development and companies use it as their competitive advantage because it represents not only a desirable but also a necessary form of behavior in all business activities. The aim of this paper was to investigate the level of CSR policies implementation in small, medium, and large companies that are operating in Bosnia and Herzegovina. The research instrument is adapted in order to analyze the application of particular CSR policies: workplace policies, environmental policies, marketplace policies, and community policies. The study also analyzed the possession standards related to the CSR implementation practice. For the purposes of the survey, data were collected from 90 companies operating in Bosnia and Herzegovina. The collection of primary data was conducted using the online survey technique. Based on the conducted research, it has been obtained that companies in Bosnia and Herzegovina, regardless of the size of the companies, apply certain forms of CSR policies in their operations. The analysis also found that companies in Bosnia and Herzegovina attach different importance to certain CSR policies. The results related to the selection of CSR areas, the directing of financial resources in CSR, as well as the method of decision-making, and the degree of application of norms and standards, indicate that companies in Bosnia and Herzegovina do not have a strategic approach to CSR.*

Economic responsibility is the primary responsibility of companies in Bosnia and Herzegovina, but following current global trends, it is necessary to work to improve other dimensions and areas of CSR. The lack of significant differences in practices of CSR companies in Bosnia and Herzegovina, with regard to their size and giving the most importance to economic aspects of CSR, indicates an insufficient understanding of the modern approach to CSR from the side of the management of the companies. Government as well as the non-profit sector should support companies in implementing CSR policies to become more environmentally and socially responsible. Nevertheless, although there is no strategic approach, it can be concluded that companies in Bosnia and Herzegovina implement certain CSR policies. Based on the research results, the paper provides an overview of CSR policies in Bosnia and Herzegovina and offers some implications guidelines for managers, as well as guidelines for future CSR research.

Keywords: *Corporate social responsibility; corporate social responsibility policies; corporate social responsibility standards; socially responsible business practices.*

JEL classification: *L21, M14, M21.*



ECONOMIC RESPONSE OF THE EUROPEAN COUNTRIES TO THE FIRST WAVE OF COVID-19

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Abstract: *COVID-19 pandemic has caused the deepest crisis since the World War II. Many countries have slid into recession due to continuous GDP fall. Lockdown has an impact on unemployment growth, while the provision of health systems and state aid to vulnerable sectors and population are deepening fiscal deficits. Based on the example of 31 European countries (27 EU members and several countries with which the Union has different agreements), this research determines impact of key economic and social variables in period of the First wave of COVID-19 pandemic on the “Economic stimulus”, which is represented by composite index CESI. It is about a combination of variables: Democracy Index, Stringency Index, Final Consumption, Gross Investment, Health Expenditure, and Hospital Beds per Thousand People. Using the median method, the total sample has been divided into two groups, the one with less and the one with more infected people. The results of cross section regression analysis show that 52% variations in the Economic stimulus in the total sample is determined by predictor variables in the model. Analysis for the countries with less infected people shows that more than 75% variations in the Economic stimulus is determined by joint trends of the predictor variables, while the Analysis with more infected cases shows coefficient of determination (R^2) over 71%. In general, the results of econometric analysis unambiguously show that democracy contributes to the economic policy response to pandemic in all three observed cases. Stringency index contributes to democracy in an inversely proportional sense, especially in the case of countries with larger number of infected persons. The same could be said for the variable Final Consumption in the case of the total sample of countries, where markedly reduced final consumption requires stronger economic reaction and the governmental aid of all the countries included in the sample.*

Key words: *pandemic; COVID-19; Europe; GDP; economic stimulus..*

JEL Classification: *O52, F40, I15, H51.*

INTRODUCTION

At the start of 2020, the world was afflicted by the COVID-19 virus pandemic that soon turned into a global crisis. Most countries' economies slid into recession, the deepest one since the Great Depression. Alongside destructive consequences for health systems, the crisis has afflicted vital economic and social trends in most countries. Health economics has been jeopardised (Feldstein (2012), Phelps, (2018)), and the economic fall has put into jeopardy the always vulnerable fiscal stability. Old and new debts will create new difficulties in paying them back. Another consequence is unavoidable political interference in the economic system and ignoring of democratic standards. In a health sense, the world records a huge number of infected people, which, at the beginning of the fourth quarter, exceeds 40 million, and staggering 1 million deaths. In the European Union and Great Britain, there are around 4, 5 million infected people and 200.000 deaths.

In contrast to estimates from the end of the first biannual, health situation at the end of the last quarter of 2020 is drastically worsening. There "fail" numerous analyses from the first half of 2020, which foresee faster economic recovery on the basis of improvement in health situation. The deepening of the crisis in the fourth quarter disputes the estimates made by the World Bank from June 2020, to the effect that the fall in the global economic growth for 2020 will amount to 5,2% (World Bank, W.B., 2020). Given that the World Bank foresaw global growth by 2,5% at the start of 2020, the estimates are that the pandemic will knock down GDP by staggering 7,7% (World Bank, WB., 2020). The Eurozone should have an aggregate fall by 9,1%. The estimates have been made on the assumption that the pandemic will fade in the second half of the year. However, the escalation of COVID-19 in the last quarter of 2020 is worsening the actual estimates of economic growth for 2020 and the recovery in 2021. If the health situation does not improve, GDP in Europe and the world will additionally decrease. The recession is putting virtually all the countries into jeopardy, regardless of their state of development, size or geographic position. This crisis is almost three times deeper than the global recession from 2009 (World Bank, WB., 2020). According to data by ILO, lost work time in the second quarter of 2020 is equivalent to loss of almost 500 million work posts. These trends have been mildly improved in the second half of the year (International Labour Organization, 2020)

Regardless of the evaluations of the big drop in the economic activity, the first estimates are over-optimistic (including the WB Report). Certain sectors have virtually stopped, like, for example, tourism, air traffic, some branches of industry and so on. International exchange and export orders have dropped, too. UNCTAD estimates are such that trade will fall by 20% annually (UNCTAD, 2020), and similar ones are given by WTO (WTO, 2020). WB Report from the second quarter of 2020 discretely envisages mild recovery for the region of Europe and Central Asia Economic. The reason for this is the recovery of China, which records gradual economic growth since the second quarter of 2020 already. Still, these effects cannot alleviate the big drop in global GDP. In 2020, China will have growth by 1,6%, so that, due to the global fall, it will increase its share in the world GDP by 1,1% and thus achieve the share of 17,5% in the world GDP. At the same time, the USA and Europe's share in the world GDP will decrease.

World governments and global world institutions are making huge efforts to fight the COVID-19 pandemic. Politics is looking for less painful solutions to reduce

the number of deaths and at the same time ensure the economic and fiscal sustainability, which are so needed for paying enormous health costs. A huge problem for the functioning of economy is closure, which has proven to be efficient in fighting the pandemic. Flaxman, et al. (2020) investigate the consequences of non-pharmaceutical measures on the example of 11 European countries for the period from 14 February to 4 May 2020. They prove that non-pharmaceutical interventions and, in particular, closures, make a huge contribution to reducing the spread of the virus. Hence, they recommend continuity of interventions. On the other hand, the decision on closure faces governments with a dangerous choice between economic and health catastrophe. Still, national and global institutions are successfully solving various problems, regardless of the spread and duration of the pandemic. A notable improvement will come with the vaccine which the optimists expect already in the first quarter of 2021. And every relief for the health system, symbolical though it may be, contributes to the relaxation of the economic and fiscal sphere, and is an introduction to normalisation and stabilisation.

This paper researches the impact of a heterogeneous group of variables on the economic policies of selected countries; more precisely, it researches the impact of democratisation, stringency index, final consumption, gross investment, health expenditure, the number of hospital beds per thousand people on the variable that synthesizes the economic policy response to the crisis, in the form of the economic stimulus shown by CESI index. A sample of 31 European countries of varying levels of economic development and Euro integration has been selected. Besides 27 EU member states, several European countries with which the Union has trade agreements or agreements on stabilisation and accession have also been included in the sample. For example, Serbia is a candidate for EU membership and signatory to the Stabilisation and Accession Agreement with the EU; Norway and Switzerland are signatories of EFTA agreement and so on. Although it is not an EU member, Great Britain does not break the economic and political relations with the Union. The sample does not include candidate and Potential Candidate countries to become Candidates: Montenegro, Northern Macedonia, Albania, BiH and Kosovo (according to resolution 1244), due to unavailable data. The initial hypothesis is that the stated independent variables positively impact the CESI index. In that context, the countries are classified into two groups: with fewer and with more people infected in the sample. Econometric analysis using the method of cross section regression analysis will show interdependence between the observed variables in all three cases: the totality for all the countries, as well as the groups with fewer and more people infected out of the total sample. Consequently, the model contains five (5) explanatory variables: Democracy Index, Stringency Index, Final Consumption, Gross Investment, Health Expenditure and Hospital Beds per Thousand People, as well as one dependent variable which represents the Economic stimulus in the form of CESI index.

LITERATURE OVERVIEW

Global coronavirus pandemic has turned existing health and economic systems upside down, as only few countries have been spared. With the existing differences between health systems, COVID-19 pandemic has caused even greater divisions. This view is advocated by Stiglitz (2020) who states that different countries afflicted by the pandemic treat their citizens in different ways. The reasons for this are the fol-

lowing: inherited differences in health systems, health inequalities and the readiness of countries to undertake adequate measures. Stiglitz perceives the need for comprehensive reforms of economic rules (new economy, new rules). For, in many countries, the pandemic has unveiled weaknesses and increased differences. From the economic perspective, the crisis is mostly reflected in the fiscal system, which finds it harder and harder to pay the incurred health costs. At the same, collection of reduced fiscal income has been made more difficult. The Eurozone is suffering from great load, too. Thus, Haroutunian, et al. (2020) analyse measures by the European Commission (end of May 2020). In addition to classical measures, they recommend that Recovery Fund be established, in order for investments and structural reforms to enable balanced recovery. The state and measures in the area of public health are key in the prevention of the spread of the virus. Elgin, Basbug, & Yalaman (2020) use Principal Component Analysis-PCA and construct CESI index (COVID-19 Economic Stimulus Index). They create information base about this index for 166 countries. The primary source for constructing the CESI index is the IMF base, sub base for Economic policy response to COVID-19. CESI is a composite index that combines adopted economic measures, such as fiscal, monetary and currency measures. The database for CESI index represents the foundation for the dependent variable in this paper. Moran, Stevanovic, & Touré (2020) use structural VAR to calculate uncertainty shock impact on the Canadian economy. The results show that such shocks lead to huge economic fall, lower inflation and significant measures to adjust the monetary policy. There appear differences in the reaction of the economy, which depend on whether the shock stems from the American economy, or from internal disorders in the Canadian economy. In the former case, the shocks are deep and short-term, whereas in the latter, there occur weaker but long-term consequences for the Canadian economy. Goutte, Peran, & Porcher (2020) examine the role of economic-social factors in COVID-19 death rate. Focusing on a densely populated region in France, they prove that unemployment, poverty, lack of formal education and residence represent important factors that determine COVID-19 death rates. Milani (2020) evaluates global VAR model and uses the database on the existing social cross-border relations between the countries. He proves that social contacts, together with the spread of infection, contribute to the coronavirus risk perception, as well as to social distancing. In the early stages of the pandemic, coronavirus risk perception in most countries arises out of pandemic shock originating from Italy, whereby they confirm the set hypothesis. Raghupathi and Raghupathi (2020) use visual analytics, comparing the economic and health data from the official institutions for the economic analysis of the USA. Total results of the analysis indicate that there is a strong positive correlation between health care costs and economic indicators (income, GDP and work productivity). Therefore, there is a strong-intensity positive relation between investments in health and the indicators of work productivity, personal consumption and GDP. Kandel, et al. (2020) research 18 indicators (tools) from the reports of 182 member states IHR (SPAR). They have established huge differences in the countries' abilities to resist epidemics. Local processes are important for building the capacity and cooperation between countries. They serve to strengthen the global control over the pandemic. Smith and Nguyen (2013) research how to improve the health systems in the countries of Europe and Central Asia (ECA), comparing them to the situation in the EU member states before the big expansion (EU-15). They notice that ECA

countries today lag behind EU-15. They recommend guidelines and reforms that will make the health system of the whole region one of the best in the world. If countries with low and medium income erode the health system, lower the quality of nutrition, or if other shocks happen, resilience will fall and death rates, even among mothers and children, will increase. Therefore, Robertson, et al. (2020) suggest that in the times of the pandemic, policy creators bring guidelines, as well as optimally distribute national resources. Estimates are that the economic consequences of COVID-19 will be heavy, especially for tens of thousands of residents with lower and medium income. Bigger economic costs, loss of work posts and closures stimulate global poverty. Mahler, et al. (2020) claim that global poverty will grow due to the pandemic. They estimate the basic and negative scenarios. The former envisages decrease of the global growth by 5%, and negative by 8%. They find reasons for this in the vulnerability of companies and reduced household consumption, which is why more and more countries with low and medium income will have new and larger financial shocks.

MATERIAL AND METHODOLOGY

Methodology

For the assessment of connection between variables, set hypotheses and conclusions, cross-sectional regression is used. It has been said that the sample includes 31 European country. In the first phase, median method is used to divide the total sample into the countries with less and more infected cases. Then, cross-sectional regression analysis is applied to data grouped in this way. In statistics and econometrics, a cross-sectional regression is a type of regression in which the explained and explanatory variables are all associated with the same single period or point in time. This type of cross-sectional analysis is in contrast to a time-series regression or longitudinal regression in which the variables are considered to be associated with a sequence of points in time (Andrews, 2005). Multiple linear regression model with cross-sectional data is used to evaluate the relationship between dependent and explanatory variables. The aim of this method is to explore the linkages between variables and to quantify the statistical significance of certain variables. Regression model is the one that shows average composition of variation of investigated incidence. Multiple regression model has the following equation(Koop, 2003):

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_k X_k + \varepsilon \quad (1)$$

where X - means independent variable, Y - dependent variable, β - regression parameter and ε is residual. The aim of regression analysis is to predict some values of Y (dependent variable, in this research it is Economic stimulus), for certain value of X (independent variables, in this research these are *the Democracy Index, Stringency Index, Final Consumption, Gross Investment, Health Expenditure, Hospital Beds (per 1,000 People)*).

Ordinary least square (OLS) method minimizes squares sum residual in order to estimate the unrecognized parameters in the sample. Furthermore, the OLS method estimates and minimizes the sum of squared residuals. The estimation of β_1 and β_2 is interpreted so that Y (dependent variable) could be predicted with the change of X_1 and

X_2 . The reliability of the model was accepted on the p-value and R square (adjusted R square). The p-value should be less than 0.05 (in some estimation the level could be higher - 0.10 or 0.15). Higher value of adjusted R square means that the model is more reliable.

Sources of data and explanation of variables in the model

The following table shows an overview and basic data on the variables used in the model.

Table 1. Dependent and Explanatory variables for the analysis and data sources

Variable	Mark in the model	Source
(A) Dependent variable		
Indeks ekonomskog stimulusa	CESI	Created Elgin, et al. (2020) with source Financial Access COVID-19 Policy Tracker, International Monetary Fund (2020)
(B) Explanatory variables		
Democracy Index 2019	DEMOCR	The Economist Intelligence Unit
Stringency index 2020	STRINGENCY	Our World in data, 2020
Final Consumption	CONSUMP	Eurostat, 2nd quarter of 2020
Gross investment	GINVEST	Eurostat, 2nd quarter of 2020
Health expenditure (2017)	HEALTHINV	World bank – WDI
Hospital beds per thousand (2017)	BEDS	Our World in data, 2020

Source: Created by the authors, using data from Elgin et al (2020), International Monetary Fund-IMF (2020), World Development Indicator- WDI (2017), Economist Intelligence Unit (2020), Our World in data - Hospital beds (2020), Our World in data- Stringency index (2020), Eurostat-Final Consumption, (2020), Eurostat-Gross investment (2020).

1. COVID-19 Economic Stimulus Index (CESI). This is a composite index that combines all the adopted economic measures due to the occurrence of COVID-19 pandemic (fiscal, monetary and currency rate interventions). Elgin et al (2020) use the Principal Component Analysis-PCA and construct CESI index. Higher index value signifies stronger measure of economic policy for every country. The primary data source for constructing CESI index is the IMF base, sub base for Economic policy response to COVID-19. CESI index base is the basis for the dependent variable in this research.

2. The Democracy Index is an index compiled by the Economist Intelligence Unit (EIU), a UK-based company. It intends to measure the state of democracy in 167 countries, of which 166 are sovereign states and 164 are UN member states. The democracy index is a weighted average based on the answers of 60 questions, each one with either two or three permitted alternative answers. Today, democracy is brought into connection with the economic growth and welfare. Their interdependence is mainly observed through the following dilemmas: Does (and to what extent) democracy stimulate or limit faster economic growth? (Ghardallou & Sridi, 2020)

3. Stringency Index is a composite measure based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value

from 0 to 100 (100 = strictest). If policies vary at the subnational level, the index is shown as the response level of the strictest sub-region.

4. Final Consumption or Private Final Consumption Expenditure includes households and Non-Profit Institutions Serving Households final consumption expenditure. Data are calculated as chain-linked volumes. Growth rates with respect to the same quarter of the previous year are calculated from raw data.

5. Gross fixed capital formation (GFCF), also known as Gross Investments, consists of resident producers' acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets. Data are calculated as chain-linked volumes. Growth rates with respect to the previous year are calculated from raw data.

6. Health Expenditure. This variable refers to current expenditures on health per capita in current US dollars. Estimates of current health expenditures include health-care goods and services consumed during each year.

7. Hospital Beds (per 1,000 People). Hospital beds include inpatient beds available in public, private, general, and specialized hospitals and rehabilitation centres. In most cases beds for both acute and chronic care are included. Our World in data, 2020.

RESULTS

Results of descriptive analysis

The first phase makes use of the median method to divide the countries into the groups with less and groups with more infected people. Then, cross section regression analysis is applied in three cases: total sample (all the countries), the group of countries with less infected people, and the group with more infected people. Dependent variable is the Economic stimulus shown by way of the CESI index, and the explanatory variables are: Democracy Index, Stringency Index, Final Consumption, Gross Investment, Health Expenditure, and Hospital Beds per Thousand. The first group with less infected cases mostly comprises the countries of Eastern Europe, whereas the second group includes founder and other member states that are economically more developed, which is shown in the next table:

Table 2. Confirmed number of infected people per million residents (June 30, 2020)

Country	Fewer infected people -left of Median	Country	More infected cases -right of Median
Slovakia	305	Norway	1633
		Austria	1961
Greece	325	Serbia	2100
Hungary	429	Denmark	2201
Latvia	592	Germany	2319
Croatia	664	France	2516
Lithuania	667	Netherlands	2931
Bulgaria	695	Switzerland	3648

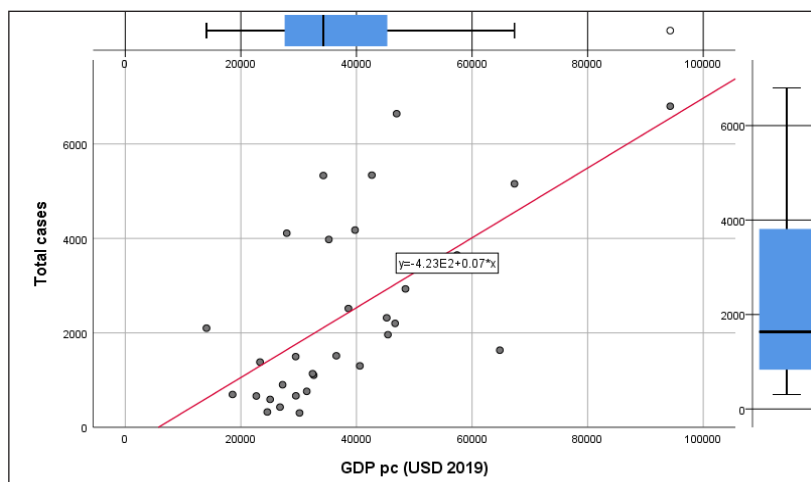
Slovenia	762	Italy	3977
Poland	902	Portugal	4110
Czech Republic	1102	United Kingdom	4177
Cyprus	1137	Ireland	5157
Finland	1301	Spain	5331
Romania	1382	Belgium	5340
Estonia	1498	Sweden	6640
Malta	1515	Luxembourg	6799

Source: Our World in Data (2020).

Table 2 provides an overview of COVID-19 infected cases per million residents. It can be seen that the group with less infected people (Left Median) mainly comprises eastern, central and southern European countries. They are mostly EU members from later expansions and mainly have lower level of economic development.

Graph 1 reveals rising regression line. Due to certain reasons, countries with higher GDPpc had larger number of infected cases. The assumption is that the countries which have higher level of development are less closed, that the interaction between residents (work, school, institutions) is greater, which is why they are more exposed to the pandemic. An additional assumption is that countries of central and Eastern Europe used to invest more in public health, in relation to the “old” developed Europe. Thus, for example, the population was vaccinated against different types of virus *en masse*, which could have impacted lower rates of infection.

The following graph shows that variables are mainly scattered around the regression line. Larger number of countries with lower income (20.000-40.000 USDpc) records lower relative rate of infection, while several richer countries (60.000-100.000 USDpc) have a high degree of infection.



Graph 1. The relationship between the number of infected people per million residents and GDPpc

Source: Authors calculation in SPSS

Regression analysis results - Total sample

What follows are results of the regression analysis where the total sample of 31 countries is included. The first section of the regression model (Model Summary) shows the determination coefficient (R Square) 0,52, which means that 52% variations in the Economic stimulus is determined by joint trends of the predictor variables in the model. The result is acceptable from the point of view of statistical analysis, in the sense of significance and model quality. Statistical significance of the model is also confirmed by the results of F test in the second section of the regression analysis (variance analysis – ANOVA), with the value 4,3 and probability below 5%.

Table 3. Total Sample - Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Df 1
1	.722 ^a	.522	.402	.887	6

^a Dependent Variable: CESI Index

^b Predictors: (Constant) Democracy Index 2020, Stringency Index, Hospital Beds per Thousand People, Final Consumption, Gross Investment, Health Expenditure

Source: Authors calculation in SPSS

Table 4. Total Sample - ANOVA^a

Model	Sum of Squares	df	Mean Square	Sig.
Regression	20.579	6	3.43	0.04 ^b
Residual	18.867	24	.786	
Total	39.446	30		

Source: Authors calculation in SPSS

The third section (Coefficients) shows coefficients of regression predictors and their respective significance for the dependent variable trend in 31 European country. Variable Democracy Index 2020 positively and statistically significantly determines the economic stimulus (CESI index). Change in Democracy Index by one unit positively determines the Economic stimulus trends by 0,129 units. This points to the conclusion that in the countries with higher degree of democracy one can expect stronger economic responses to pandemic shocks. A similar conclusion holds for the independent variables - Final Consumption, Health Expenditure and Hospital Beds per Thousand People, while individual coefficients of independent variables Stringency Index and Gross Investment are not statistically significant for the dependent variable trends.

Table 5. Total Sample - Coefficients^a

Del	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-9.352	2.795		-3.346	.003
Democracy Index 2020	.129	.037	1.233	3.502	.002
Stringency index	-.026	.013	-.283	-1.897	.070
Final Consumption	-.088	.033	-.433	-2.676	.013
Gross investment	-.016	.012	-.203	-1.303	.205
Health expenditure	.000	.000	-.803	-2.448	.022
Hospital beds per thousand	.287	.121	.421	2.372	.026

^a Dependent Variable: CESI Index**Source:** Authors calculation in SPSS**Regression analysis results - countries with fewer infected people**

In the first section of the regression model (Model Summary), where countries with fewer infected people are grouped, the determination coefficient (R Square) amounts to 0,751, meaning that more than 75% variations in the Economic stimulus (CESI index) is determined by joint trends of the predictor variables in the model. The result is acceptable from the point of view of statistical analysis, in the sense of the significance and quality of the model. Statistical significance of the model in the second section (variance analysis – ANOVA) shows that the F test result is 3,52 and the probability is somewhat higher than 5%, and they are outside the acceptability ranges. The indicator is logical if it is compared to the previous model, because it includes smaller number of countries from the first half of the median. Those countries have greater variability and lower freedom degree in variations among the phenomena.

Table 6. Fewer infected cases - Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	df1
1	.867 ^a	.751	.538	.4282	6

^a Dependent Variable: CESI Index^b Predictors: (Constant) Democracy Index 2020, Stringency Index, Hospital Beds per Thousand People, Final Consumption, Gross Investment, Health Expenditure**Source:** Authors calculation in SPSS**Table 7.** Fewer infected cases ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.874	6	.646	3.522	.062 ^b
	Residual	1.283	7	.183		
	Total	5.157	13			

^a Dependent Variable: CESI Index^b Predictors: (Constant) Hospital Beds per Thousand, Stringency Index, Final Consumption, Gross Investment, Democracy Index 2020, Health Expenditure**Source:** Authors calculation in SPSS

The third section shows the coefficients of regression predictors and their respective significance for the dependent variable trends for countries with less infected people. Variable Democracy Index 2020 is positive and statistically significantly determines the economic stimulus trends (statistical significance below the 5% cut-off value). Change in Democracy Index by one unit positively determines the Economic stimulus by 0,079 units. The conclusion is that countries with fewer infected people also have lower level of democracy (in relation to the total sample). And the lower number of registered cases, together with the lower level of democracy, cause weaker reaction of the economic stimulus in those countries. Alongside Democracy Index, the only independent variable that is significant for the dependent variable trends is investing in health. Variables Final Consumption, Hospital Beds per Thousand People, Stringency Index, and Gross Investment are not statistically significant for the dependent variable trends in the regression model.

Table 8. Fewer infected cases - Coefficients^a

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-1.893	2.792		-.678	.520
Democracy Index 2020	.079	.030	1.023	2.685	.031
Stringency index	-.013	.017	-.175	-.763	.470
Final Consumption	-.027	.037	-.196	-.713	.499
Gross investment	-.001	.019	-.015	-.044	.966
Health expenditure	-.001	.000	-1.179	-2.453	.044
Hospital beds per thousand	-.286	.228	-.623	-1.255	.250

^a Dependent Variable: CESI Index

Source: Authors calculation in SPSS

Regression analysis results – countries with more infected cases

This model shows regression analysis for countries with more infected cases. In the first section of the regression model (Model Summary), the determination coefficient (R Square) amounts to 0,714, meaning that over 71% variations in the Economic stimulus (CESI) is determined by joint trends of predictor variables in the model. The result is acceptable in the sense of significance and quality of the model. Statistical significance is also confirmed by the F test results of 4,157 and probability below 5% in the variance analysis in the second section of the regression analysis (ANOVA).

Table 9. More infected cases - Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.845 ^a	.714	.542	.931

^a Dependent Variable: CESI Index

^b Predictors: (Constant) Democracy Index 2020, Stringency Index, Hospital Beds per Thousand People, Final Consumption, Gross Investment, Health Expenditure

Source: Authors calculation in SPSS

Table 10. More infected cases - ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.628	6	3.605	4.157	.023 ^b
	Residual	8.672	10	.867		
	Total	30.300	16			

a. Dependent Variable: CESI Index

b. Predictors: (Constant) Hospital Beds per Thousand People, Health Expenditure, Gross Investment, Stringency Index, Final Consumption, Democracy Index 2020

Source: Authors calculation in SPSS

The third section shows the coefficients of regression predictors and their respective significance for the dependent variable trends, for the countries with more than 50% infected cases. Variables Democracy Index 2020, Hospital Beds per Thousand People positively and statistically significantly determine the economic stimulus trends. Change in Democracy Index by one unit positively determines the Economic stimulus by 0,247 units. The conclusion is that the countries from the sample with more infected cases have higher levels of democracy. Furthermore, there is a significant impact and higher values of coefficients in determining the dependent variable trends (CESI index). More infected cases, higher degree of democracy and lower stringency index cause stronger reaction of the economic stimulus in those countries. Alongside Democracy Index and Stringency Index, Hospital Beds per Thousand People and Health Expenditure are also significant variables for the dependent variable trends.

Table 11. More infected cases - Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-14.821	4.105		-3.610	.005
	Democracy Index 2020	.247	.065	1.732	3.820	.003
	Stringency index	-.055	.019	-.574	-2.894	.016
	Final Consumption	-.050	.059	-.197	-.857	.412
	Gross investment	-.013	.019	-.152	-.677	.514
	Health expenditure	-.001	.000	-1.601	-3.451	.006
	Hospital beds per thousand	.427	.147	.534	2.903	.016

^a Dependent Variable: CESI Index

Source: Authors calculation in SPSS

DISCUSSION AND CONCLUSION

In addition to enormous number of people infected and those who died, the global pandemic caused by COVID-19 virus has brought the world on the brink of economic catastrophe. At the start of 2020, the pandemic rapidly spread from China to Europe, USA and the whole world. The fall of GDP and investments, the growth of unemployment and debts, are only some of the negative reflections on the economic system.

Lockdown and other non-pharmaceutical measures, as well as increase in expenditures for health care, have additionally worsened the economic situation in all the countries of the world. Logically, there ensued decisive and fast responses on the part of many countries, which have mainly been created by national governments on the basis of recommendations by WHO (2020). Undertaken measures are more or less successful, which is testified by the results of the research for 31 European country.

Analysis of the relationship between the number of infected people per one million citizens and GDPpc shows that the majority of countries with lower income have lower rate of infection, while several richer countries have been infected more. This is interesting as much as indicative data. Also, the division into two groups represents the basis for researching the impact of selected economic-social variables on the variable Economic stimulus, which has been represented by way of composite index CESI.

The results of regression analysis on the sample of all 31 European country show that Democracy Index positively and statistically significantly impacts the economic stimulus (that is, the CESI index). Change in Democracy Index by one unit causes positive reaction to Economic stimulus by 0,129 units. Hence, more democratic countries give stronger economic response to pandemic shocks. Similar holds for Final Consumption, Health Expenditure and Hospital Beds per Thousand People. Variables Stringency Index and Gross Investment are not statistically significant.

The results for the group of countries with fewer infected cases show that democracy has positive and statistically significant impact on the economic stimulus. Change in Democracy Index by one unit causes positive reaction to Economic stimulus by 0,079 units. The group of countries with lower level of democracy has lower infection rates. Hence, lower number of registered cases and lower level of democracy have caused weaker reaction of the economic stimulus in these countries. Apart from the Democracy Index, investment in the health sector is significant too, whereas Final Consumption, Hospital Beds per Thousand People, Stringency Index, and Gross Investment are not statistically significant.

In the group of countries with more than 50% infection rate, democracy and the number of hospital beds per thousand people have positive and statistically significant impact on the economic stimulus. Change in Democracy Index by one unit causes positive reaction of Economic stimulus by 0,247 units. The group of countries with more infected cases has higher level of democracy and is significant from the aspect of impact on CESI index. More infected cases, higher degree of democracy and lower stringency index cause stronger reaction of the economic stimulus. Likewise, the number of hospital beds per thousand people and health expenditure are significant in relation to the economic stimulus.

In general, the results show that the state of democracy impacts the economic policy responses to the pandemic, that is, it contributes to the response to COVID-19

in all the cases observed. In contrast, stringency index has an inversely proportional impact on democracy, especially in countries with more infected cases. Furthermore, variable Final Consumption in the total sample, where final consumption has been significantly reduced, requires stronger economic reaction and aid from the governments of the countries in the sample. It is obvious that the observed variables (for all the observed groups of European countries) impact on CESI index, as well as on GDP, that is, they relevantly represent economic and wider social responses to the COVID-19 pandemic.

Economic and social damage caused by the COVID-19 pandemic is enormous. The hardest one is that in human lives, but we must not forget shocks that have led to unprecedented GDP fall, unemployment growth, indebtedness, fall in investments, financial instability and the like. Numerous economic sectors have been drastically afflicted, company profits jeopardised, and the same holds for household and individual income. Analyses from the first half of the year had envisaged stabilisation of the health situation and the beginning of economic recovery. However, events from the last quarter do not awake optimism. Not even better results achieved by China are sufficient to alleviate recession and fall in global GDP by 5,25%. The economic and wider social crises caused by the COVID-19 pandemic will be felt in the world for many years to come.

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PREPREKE ZA IMPLEMENTACIJU KORONA ZAKONA NA SEKTOR MALOG I SREDNJEG PODUZETNIŠTVA U BOSNI I HERCEGOVINI

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Sažetak: Cilj – cilj ovoga rada je empirijski istražiti prepreke uspješnoj primjeni Korona zakona na mala i srednja poduzeća u BiH. Istražit će se utječu li na provedbu predviđenih mjera unutarnji, odnosno organizacijski čimbenici poput nedostatka komunikacije, informacija i obuke, nedostatka odgovarajuće organizacijske podrške, neprimjerenog vodstva i sl. ili općenito Vladine politike i mjere. Metodologija – u radu će se koristiti anketni upitnik kako bi se identificirale prepreke u uspješnoj implementaciji i provedbi Korona zakona koje su iskusile mala i srednja poduzeća. Od sudionika (vlasnika – menadžera malih i srednjih poduzeća) će se tražiti da navedu stupanj slaganja sa stavkama navedenim u upitniku. Primijeniti će se regresijska analiza za utvrđivanje faktora koji utječu na uspješnu/neuspješnu implementaciju Korona zakona. Praktične implikacije - Ovo istraživanje nudi vrijedne praktične spoznaje koje mogu pružiti uvid u stanje malih i srednjih poduzeća u BiH. Rezultati istraživanja pružiti će podlogu za stvaranje sustava koji će pomoći stjecanju znanja i upravljačkih mehanizama za dugoročan rast i razvoj malog i srednjeg poduzetništva u BiH i očuvanja radnih mjesta.

Ključne riječi: strategija; Korona zakon; mala i srednja poduzeća; barijere.

JEL klasifikacija: D23, D81, M21.

UVOD

Odluke o strateškom upravljanju predmet su rastuće teorijskog i empirijskog istraživanja u poslovnoj literaturi. Središnje pitanje u literaturi je istraživanje prepreka za uspješno usvajanje strategije promatrajući odnos između strateškog upravljanja i organizacijske performanse. Promjene u globalnoj ekonomiji čine svijet manjim, a tvrtke

se natječu na novim tržištima. S ovim promjenama postaje neophodno da organizacije planiraju dalje u budućnost i sa većom strukturom nego u prošlosti. Uspješna provedba strategija vitalna je za svaku organizaciju, bilo javnu ili privatnu. Bez provedbe, čak i najnaprednija strategija je beskorisna (Aaltonen & Ikävalko, 2002)). Prema istraživanju koje su proveli Kaplan i Norton (Kaplan & Norton, 2008) 95 posto osoblja nije svjesno organizacijske strategije niti razumije ust. (Johnson, 2012) također vjeruje da se 66 posto organizacijskih strategija ne izvršava. U mnogim slučajevima to nije zbog loše strategije i ideja koja stoji iza nje. Mnoge su vrijedne strategije suočene s problemom i neuspjehom u fazi implementacije. U osnovi, glavni izazovi u strateškom upravljanje leži u provedbi strategija, a ne u fazi razvoja (Ali & Hadi, 2012). Pitanje je zašto je strategiju tako teško provesti? Prethodna istraživanja utvrdila su da je problem u fazi provedbe zbog toga što postoje brojne barijere koje javljaju prilikom izvršavanja strategije. Organizacijska strategija mora se planirati, organizirati, uložiti napor i kontrolirati kako bi se odredila dugoročna izvedba (Ahmad & Rajuddin, 2006). Poslovno okruženje postaje složenije, potreba za preoblikovanjem strategije postaje sve češća i kao rezultat toga, stariji rukovoditelji suočavaju se s potrebom da integriraju brojne promjene ili revidiraju strategiju.

U svjetskoj ekonomiji mala i srednja poduzeća (u nastavku MSP) dominiraju u broju poduzeća (90-99% svih poduzeća, ovisno o korištenoj definiciji) i po ekonomskim doprinosima (rast BDP-a, produktivnost, stvaranje radnih mjesta, inovacije, razina tržišnog natjecanja itd.) (Lundström & Stevenson, 2001). Budući da male tvrtke generiraju radna mjesta, porezne prihode, funkcionalne proizvode, dobrotvorne donacije, tehnološki razvoj i socijalne doprinose zajednicama, njihov uspjeh i održivost važni su za društveni i ekonomski razvoj (Williams, Smith, Aaron, Manley, & McDowell, 2020). Međutim, dobro je poznato da je strateško planiranje rijetko ili uopće ne postoji u većini MSP-a. U praksi MSP se usmjeravaju na kratkoročna operativna, a ne na dugoročna strateška pitanja, i donošenje odluka ima tendenciju da bude reaktivno, a ne proaktivno. U malim i srednjim poduzećima koja tvrde da planiraju, planovi su često ad hoc i intuitivni, a ne formalno napisani, i ne pružaju osnovu na kojoj se mogu izmjeriti ili analizirati poslovne performanse (Wang, Walker, & Redmond, 2007). U skladu s tim, usmjeravanje istraživanja radi objašnjenja nedostatak strateškog planiranja u malim i srednjim poduzećima usredotočio se na identificiranje „barijera“ koje obeshrabruju ili spriječiti strateško planiranje i provedbu strategije. Neki autori su predložili da nesigurno okruženje ili turbulencija (Matthews & Scott, 1995), veličina poduzeća (Stonehouse & Pemberton, 2002), vrsta industrije (Shrader, Mulford, & Blackburn, 1989), unutarne implementacijske barijere (O'Regan & Ghobadian, 2002) i poslovni životni ciklus / faza razvoja (Maureen, 1998) utječe na razinu strateškog planiranja u malim i srednjim poduzećima. U nastavku rada, definirat će se predmet i ciljevi istraživanja, dati pregled literature, pojašnjenje Korona zakona i predstaviti rezultati istraživanja.

PREDMET I CILJEVI ISTRAŽIVANJA

Da bi se razumio i objasnio gore spomenuti problem, neophodno je objektivno i empirijski istražiti njegovo podrijetlo i identificirati odgovarajuće metode za njegovo rješavanje. Stoga je predmet ovog istraživanja utvrđivanje položaja sektora malih i srednjih poduzeća u Bosni i Hercegovini tijekom pandemije Covid 19 i utvrđivanje glavnih

barijera koje su utjecale na implementaciju Korona zakona kao strateške mjere na sektor malih i srednjih poduzeća u Bosni i Hercegovini. Glavni ciljevi istraživanja su:

- Teorijski istražiti važnost definiranja strategije i njene implementacije u malim i srednjim poduzećima
- Utvrditi barijere koje utječu na implemetaciju strateških ciljeva i mjera predviđenih Korona zakonom
- Objasniti Korona zakon i njegov implikacije na realni sektor u BiH

PREGLED LITERATURE

Barijere za implementaciju strategije u malim i srednjim poduzećima

Strategija je dugoročni smjer i opseg organizacije kojim organizacija postiže prednost kroz konfiguraciju resursa u izazovnom okruženju, kako bi se udovoljilo potrebama tržišta i ispunilo očekivanja dioničara (Johnson & Scholes, 2003). Provedba izrađene strategije mogla bi imati ogroman utjecaj na ukupni uspjeh organizacije, stoga strategija može dodati vrijednost organizaciji samo ako je uspješno provedena (Smith, 2011). Prema nekim istraživanjima, razne barijere mogle bi utjecati na uspješnu provedbu strategije, no malo je studija pokušalo utvrditi koje su to točno barijere (Heide, Grønhaug, & Johanness, 2002). Te barijere mogu dovesti do potpunog sloma formulirane strategije. Proces izrade strategije trebao bi kulminirati jasno komuniciranim poslovnim dizajnom i raspodjelom potrebnih resursa (Harreld, O'Reilly III, & Tushman, 2007). Provedba započinje iskrenom procjenom trenutne organizacijske usklađenosti i sposobnosti. Budući da je provedba strategije često popraćena promjenama u procesu, sustavu, pa čak i strukturi organizacije (Lawrence & Joyce, 1984) rukovoditelji moraju donijeti mudre odluke kad pristupe određenim strategijama koje bi mogle utjecati na ljude i njihovu cjelokupnu provedbu. Barijere su oni čimbenici koji ometaju, sprečavaju, blokiraju ili ometaju proces provedbe strategije (Lihalo, 2013). To su čimbenici prepreka ili kamen spoticanja, što otežava organizaciji da ostvari svoje ciljeve i bude tamo gdje želi u godinama koje dolaze. Mnoge su empirijske studije (Taslak, 2004) i (O'Regan & Ghobadian, 2002) i predložili neke potencijalne vanjske i unutarnje probleme, koje se nazivaju i barijerama, a koji utječu na provedbu strategije. Te barijere ovise o vrsti strategije, vrsti organizacije i prevladavajućim okolnostima koji se mogu izbjeći ako se razvoj strategije poveže s provedbom. Kad se radi o unutarnjim barijerama postoje četiri glavne prepreke za uspješno izvršavanje strategije, a to su: nedostatak vizije, resursne barijere, menadžerske barijere, i ljudske barijere (Kaplan & Norton, 2008). Uz četiri prepreke strategija komuniciranja također ima kritičnu vrijednost kod usklađivanja organizacijskih jedinica i pojedinaca (Kaplan & Norton, 2008). Štoviše, postupak komunikacije i usklađivanja započet će već određivanjem strateških tema i ciljeva. Jones smatra da postoje dvije glavne zapreke prilikom komuniciranja strategije, razumijevanje strategije i neuspjeh u prenošenju strategije ljudima (Jones, 2008).

O'Regan i Ghobadian su proučavali mala i srednja poduzeća u elektroničkom i inženjerskom sektoru u Velikoj Britaniji. Utvrdili su osam glavnih prepreka u provedbi strateškog planiranja. Pet ih je bilo unutarnjeg usmjerenja: komunikacija je bila neadekvatna; provedba je trajala duže nego što se očekivalo; manjak sposobnosti zaposlenika; sveukupni ciljevi strategije koje osoblje ne razumije dovoljno dobro; koordinacija u provedbi nije dovoljno učinkovita; a tri su bila vanjska: krize su odvratile pozornost

od provedbe; pojavili su se neočekivani vanjski problemi; i vanjski čimbenici koji su utjecali na provedbu (O'Regan & Ghobadian, 2002). Lihalo je ispitao prepreke za uspješno usvajanje strategije od strane srednjih poduzeća u Keniji. Ukazao je na unutarnje prepreke, uključujući upravljanje, komunikaciju, ljudske čimbenike kao što su otpor promjenama, vodstvo, organizacijska struktura, informacijski sustavi i tehnologija. Dalje je ukazao na vanjske prepreke, uključujući promjene u operativnom okruženju, nepredviđenu konkurenciju ili ulazak novih igrača u industriji te promjene u vladinim politikama (Lihalo, 2013). Taslak je ispitivao probleme provedbe strategije u turskoj tekstilnoj industriji. Otkrio je da se šest problema često događalo u tim poduzećima (Taslak, 2004). Provedba im je oduzela više vremena nego što je prvotno planirano; nekontrolirane sile u vanjskom okruženju; natjecateljske aktivnosti odvratile su pozornost od provedbene odluke; problemi nisu dovoljno rano priopćeni najvišem menadžmentu; isplivali problemi koji ranije nisu bili identificirani; a ključni formulatori strateške odluke nisu igrali ključ ulogu tijekom postupka provedbe. Također je otkrio da su manje uspješna poduzeća tijekom postupka implementacije imala više predloženih problema nego poduzeća s većim uspjehom. Al-Ghamdi koristio je anketni upitnik kako bi identificirao ponavljajuće probleme u usvajanju strategije u Velikoj Britaniji. Otkrio je da su komunikacija, podrška upravljanju i dobri informacijski sustavi ključni alati za nesmetan postupak implementacije. Al-Ghamdi je zaključio da se formiranje strategije ne može odvojiti od provedbe strategije (Al-Ghamdi, 1998). O'Regan i Ghobadian primijetili su da mala i srednja poduzeća (MSP) koja uključuju formalno strateško planiranje imaju manje prepreka u provedbi strategije od onih koja to nemaju (O'Regan & Ghobadian, 2002).

Prepreke provedbi strategije uključuju nedostatak konsenzusa, razumijevanja i transparentnosti u pogledu značenja misije i vizije poduzeća, nedostatak odnosa između strateškog sadržaja i strateškog procesa, nedostatak koherentnosti između strateškog planiranja i raspodjele resursa, nedostatak strateških povratnih informacija, relativno nefleksibilna formalna struktura zbog informatičke tehnologije, nedostatak uključenosti menadžmenta organizacije i korištenje modela neprikladnih za organizacijsku stvarnost (Canhada & Rese, 2011). Prema Nobleu, postoje dvije opće dimenzije u provedbi strategije: strukturni pogled (struktura tvrtke i kontrolni mehanizmi) i međuljudski pogled (strateški konsenzus, ponašanje, organizacijska klima, komunikacijski i interakcijski procesi). Također, Noble, u svom drugom članku: Izgradnja mreže za provedbu strategije, predlaže nekoliko upravljačkih poluga (ciljevi, organizacijska struktura, vodstvo, komunikacija i poticaji) bitnih za provođenje strategije u prema sljedećim fazama: preprimjenjivanje, organiziranje napora u provedbi, upravljanje procesom implementacije i maksimiziranje višefunkcionalnih performansi (Noble, 1999). Li, Guohui i Eppler su dali pregled literature o čimbenicima koji utječu na provedbu strategije i dali zaključak kako postoje pojedinačni čimbenici koji utječu na provedbu strategije i koji se mogu podijeliti na: meke čimbenike (čimbenici usmjereni na ljude: komunikacija, konsenzus i predanost), čvrste čimbenike (institucionalni čimbenici: organizacijska struktura i administrativni sustav) i mješovite čimbenike (formulacija strategije, odnos između različitih hijerarhijskih razina i strategija itd.) (Li, Guohui, & Eppler, 2008). Osim ovih čimbenika, neki od autora ((Al-Ghamdi, 1998) i (Kalali, Anvari, Pourezat, & Dastjerdi, 2011) primijetili su i utjecaj dodatnih čimbenika kao što nekontrolirani vanjski čimbenici.

Vanjski čimbenici su oni koji se nalaze izvan organizacije i uključuju čimbenike poput ekonomskih, političko-pravnih, socijalnih, tehnoloških i okolišnih (Lihalo, 2013). *Ekonomski čimbenici* su kupovna moć ljudi koja ovisi o njihovom trenutnom dohotku, štednji, cijenama i dostupnosti kredita. Promjene u ekonomskom okruženju utječu na ukupnu financijsku uspješnost organizacije. *Čimbenici socijalne okoline* odnose se na promjene u društvenim vrijednostima, ponašanju i stavovima u vezi s rađanjem djece, brakom, životnim stilom, poslom, etikom, spolnim ulogama, rasnom jednakosti i socijalnim odgovornostima, među ostalima će utjecati na razvoj poduzeća (Pearce II & Robinson, 2003). *Političko-pravni faktori* odnose se na neočekivane promjene u vladinim politikama kao što su oporezivanje, promjene zakona, poticaji, politike zaštite okoliša i obrazovanja. *Ulazak važnih novih konkurenata* u industriju može organizaciju baciti u bijes. Očekivani novi zamjenski ili konkurentski proizvodi mogu učiniti proizvode organizacije nekonkurentnima (Pearce II & Robinson, 2003). Potrebno je predvidjeti promjene operativnog okruženja, poput onih u profilima kupaca, i prilagoditi strategije tako da odgovaraju očekivanjima kupaca. Izazov napretka u inovacijskoj tehnologiji znači da organizacija mora osigurati da njezino osoblje bude ažurno. Resursi potrebni za provedbu strategije mogu biti izvan mogućnosti organizacije što dovodi do toga da se strategija ne provodi (Lihalo, 2013).

Korona zakon

Zakon o ublažavanju negativnih ekonomskih posljedica, poznatiji pod nazivom Korona-Zakon, objavljen je u „Službenim novinama Federacije BiH“ broj 28/20 od 07.05.2020. godine (<http://www.pufbih.ba/v1/>, 2020). Zakon je stupio na snagu narednog dana od dana objavljivanja u „Službenim novinama“, tj. od 08.05.2020. godine. Ovim zakonom propisana su: subvencioniranja doprinosa za obaveza osiguranja, obustava obračuna i plaćanja zatezne kamate na javne prihode i zatezne kamate na zakašnjela plaćanja u dužničko-povjerilačkim odnosima, ukidanje obaveza plaćanja akontacije poreza na dobit i akontacije poreza na dohodak od samostalne djelatnosti, prekid prinudne naplate, održavanje stabilnosti pojedinih isplata, odgoda primjene propisa za vrijeme trajanja stanja nesreće, te uspostava Garancijskog fonda.

Poslovni subjekti iz člana 2. tačka a) Korona zakona imaju pravo na subvencioniranje doprinosa u skladu sa ovim zakonom u iznosu 244,85 KM mjesečno po svakom zaposlenom počevši od obračuna i isplate bruto plaće za april 2020. godine i svaki naredni mjesec, uključujući i obračun i isplatu plaća i za mjesec nakon prestanka stanja nesreće. Subvencioniranje doprinosa za svakog zaposlenog vrši se na način da se za penziono-invalidsko osiguranje usmjerava 135,70 KM, za zdravstveno osiguranje 97,35 KM i za nezaposlenost 11,80 KM, ukoliko u mjesecu za koji se vrši obračun plaće imaju pad ostvarenog prometa 20% i više u odnosu na ostvareni promet u istom mjesecu 2019. godine. (<http://www.pufbih.ba/v1/>, 2020)

METODOLOGIJA

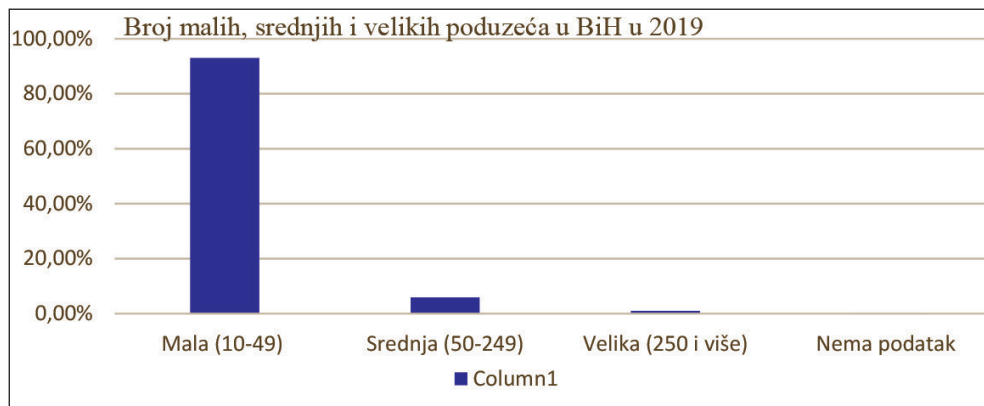
Uzorak: Na upitnik je odgovorilo 62, među 150 pozvanih poduzeća da sudjeluju. Poziv za popunjavanje anketnog upitnika poslan je malim i srednjim poduzećima u Federaciji Bosni i Hercegovini. Većina poduzeća, njih 95% je sa područja Bosne i Her-

cegovine, a ostatak, njih 5 % je iz Republike Srpske. Kada je u pitanju područje odgovornosti u poduzećima, 75 % ispitanika su vlasnici poduzeća, 20 % su voditelji službe za financije ili komercijalne poslove, a ostali ispitanici su na poslovima prodaje, marketinga ili razvoja novih proizvoda. 95% poduzeća koja su sudjelovala u istraživanju su mikro ili mala poduzeća koja imaju između 1 i 49 uposlenih, a ostalih 5% poduzeća su poduzeća srednje veličine koja imaju između 50 i 249 zaposlenih. S obzirom da su većina poduzeća iz uzorka mala poduzeća, prema ovom istraživanju, njihov godišnji promet je ispod 4 milijuna KM. 15 % poduzeća se izjasnilo da ima promet između 4 milijuna KM i 20 milijuna KM. Između 20 i 100 milijuna godišnjeg prihoda ima 5% anketiranih poduzeća. Kada je u pitanju industrijska grana kojoj anketirana poduzeća pripadaju, istraživanje pokazuje kako 47% poduzeća spada u trgovinu na malo, 26% u trgovinu na veliko, 21% poduzeća se bave proizvodnjom, 15% su financije, osiguranje i nekretnine, ostalo su građevina, poljoprivreda i šumarstvo.

Metode istraživanja: primarni i sekundarni podaci korišteni su za donošenje odgovarajućih zaključaka. U radu su korištene statističke metode za analizu podataka, prije svega deskriptivna statistika u okviru kojih su rezultati predstavljeni tabelarno, grafički, a izračunata je aritmetička sredina, kao prosječan odgovor ispitanika, zatim, standardna devijacija, kao prosječno odstupanje od prosječne vrijednosti odgovora, rang, kao maksimalna i minimalna vrijednost odgovora. Testirani su interne barijere (neprimjereno vodstvo, nedostatak identifikacije glavnih problema, nedostatak razumijevanja mjera, neprimjerena raspodjela resursa, nedostatak odgovarajuće predanosti menadžera, neadekvatna komunikacija) i eksterne barijere (nejasna regulacija i izvršna politika, vremensko ograničenje – zakašnjelo donošenje mjera, mjere nisu dovoljne, kreatori Korona zakona nemaju interesa ni volje da se mjere implementiraju i sprovedu, nema sinergije između Korona zakona i strateških potreba malih i srednjih poduzeća, mjere su kratkoročnog karaktera). Korištena je Likertova 5-stupanjska skala (1 – nimalo se ne slažem, 5 – potpuno se slažem) kojom se testira u kojoj mjeri se ispitanici slažu sa ponuđenim izjavama. U slučaju analize međuzavisnosti između kvalitativnih varijabli sa malim brojem modaliteta koristi se Hi – kvadrat test nezavisnosti između dva obolježja. Ukoliko je p vrijednost hi – kvadrat testa, koja prati vrijednost za hi – kvadrat empirijsko, manja od vrijednosti 0,05 (ako se radi o grešci prve vrste – 5%) zaključak je da postoji međuzavisnost varijabli uključenih u Hi – kvadrat test kroz odgovarajuću tabelu ukrštanja, to jeste da te varijable nisu međusobno nezavisne (Jerković, Obhodaš, & Ilić, 2019).

Analiza dobivenih podataka

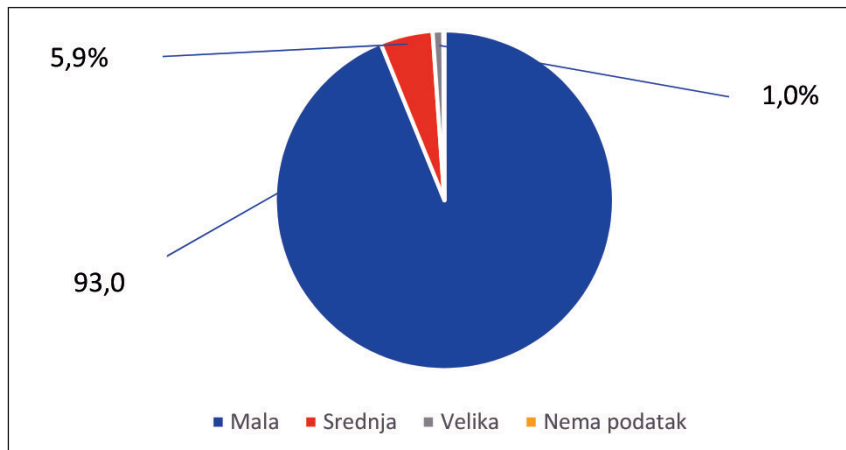
Prema podacima Agencije za statistiku Bosne i Hercegovine najveći udio u ukupnom broju razvrstanih gospodarskih subjekata za 2019. godinu imaju mala poduzeća, 93% (1–49 zaposlenih), poduzeća srednje veličine u ukupnom broju sudjeluju sa 5,9%, dok je udio velikih poduzeća (250 i više zaposlenih) samo 1,0 % (Grafikon 1).



Grafikon 1. Broj malih, srednjih i velikih poduzeća u BiH u 2019. godini

Izvor: autori, prema BHAS, dostupno na: (www.bhas.ba, 2019)

Razvrstavanje gospodarskih subjekata u klase prema veličini korištenjem kriterija „broj zaposlenih“ pokazuje kako najveći udio u ukupnom broju razvrstanih gospodarskih subjekata za 2019. godinu, čak 95 % imaju mala poduzeća (1–49 zaposlenih), srednja poduzeća (50–249 zaposlenih) sa 4,9 %, dok je udio velikih poduzeća (250 i više zaposlenih) samo 1,0 % (Grafikon 2).



Grafikon 2. Poduzeća po klasama zaposlenih u 2019, struktura u %

Izvor: autori, prema BHAS, dostupno na: (www.bhas.ba, 2019)

Naredna analiza predstavlja stavove ispitanih predstavnika malih i srednjih poduzeća u Bosni i Hercegovini te njihovi stavovi po pitanju eksternih i internih faktora koji utječu na poslovanje malih i srednjih poduzeća (MSP) za vrijeme pandemije Covid-19. Istraživanje u vidu eskternih faktora ispituje utjecaj i mjere koje je Korona zakon imao na poslovanje MSP, te da li su njihovi efekti dali željene rezultate.

Tabela 1. Pad/rast u poslovanju

Koliki je pad ili rast industrije u kojoj poslujete u odnosu na prethodnu poslovnu godinu					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pad više od 10%	40	64.5	64.5	64.5
	Pad od 5 do 10%	12	19.4	19.4	83.9
	Stabilno	10	16.1	16.1	100.0
	Total	62	100.0	100.0	

Izvor: obrada autora

U Tabeli 1 može se vidjeti trenutno stanje privrede i u kojoj mjeri je Covid-19 ostavio traga na privredu. Čak 65% ispitanih kompanija je doživjelo pad veći od 10%, dok je 19,4% ispitanika doživjelo pad između 5 i 10%, 16,1% kompanija odgovorilo da je njihovo poslovanje stabilno. Nitko od ispitanika nije odgovorio da su imali rast u poslovanju.

Grafički prikaz strukture odgovora predstavljen je na grafikonu koji slijedi:

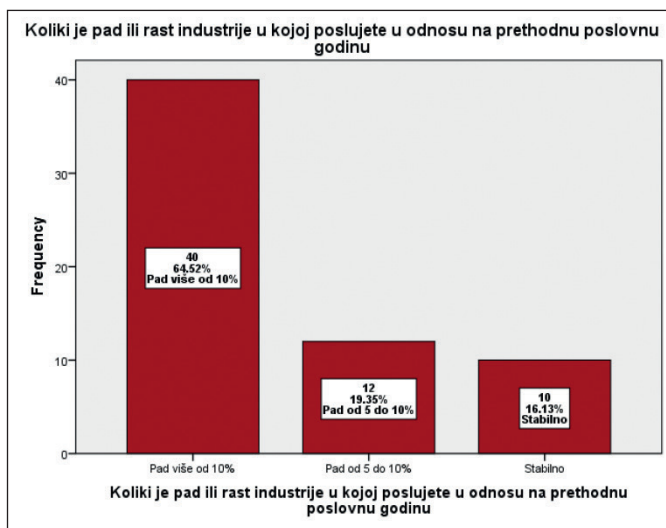
**Grafikon 3.** Pad/rast u poslovanju**Izvor:** obrada autora

Tabela 2. Interne barijere

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Nepprimjereno vodstvo je bilo je prepreka u provedbi mjera predviđenih Korona zakonom?	62	1.00	5.00	2.8710	1.41981
Nedostatak identifikacije glavnih problema bila je prepreka u provedbi mjera predviđenih Korona zakonom?	62	1.00	5.00	3.0968	1.12657
Nepprimjerena raspodjela resursa bila je prepreka u provedbi mjera predviđenih Korona zakonom?	62	1.00	5.00	3.0968	1.38741
Nedostatak odgovarajuće predanosti menadžera bila je prepreka u provedbi mjera predviđenih Korona zakonom?	62	1.00	5.00	2.8387	1.38130
Valid N (listwise)	62				

Izvor: obrada autora

Prema rezultatima iz Tabele 2 koja ocjenjuju utjecaj internih faktora na poslovanje MSP, a koje smo u Tabeli 1 pokazali da je u negativnom trendu, zbog nastale situacije uzrokovane Covidom- 19, može se zaključiti da je u manjoj ili neznatnoj mjeri imala utjecaj. Naime, ispitanici su interne faktore ocjenili u rasponu od 2,83 do 3,25, što se na skali od 1 do 5 može okarakterizirati kao niska ocjena. Ispitanici se uglavnom ne slažu sa izjavama da je nedostatak odgovarajuće predanosti menadžera bila prepreka u provedbi mjera predviđenih Korona zakonom i da je vodstvo bilo neprimjereno i time bilo prepreka u provedbi mjera predviđenih Korona zakonom (prosječna vrijednost 2,8387 i 2,871). Prema tome, ispitanici su u srednjoj mjeri ocjenili interne faktore i njihov utjecaj na poslovanje tokom perioda koji je nastao nakon pojave Covid-19.

Tabela 3. Eksterne barijere

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Mjere definirane Korona zakonom nisu dovoljne?	62	1.00	5.00	3.9032	1.23752
Kreatori Korona zakona nemaju interesa ni volje da se mjere implementiraju i sprovedu?	62	2.00	5.00	4.0323	1.07074
Nema sinergije između Korona zakona i strateških potreba malih i srednjih poduzeća?	62	3.00	5.00	4.0323	.90477
Mjere određene Korona zakonom su kratkoročnog karaktera	62	2.00	5.00	4.0000	1.05582
Vremensko ograničenje – zakašnjelo donošenje mjera bila je prepreka u provedbi mjera predviđenih Korona zakonom?	62	1.00	5.00	3.2581	1.17258
Valid N (listwise)	62				

Izvor: obrada autora

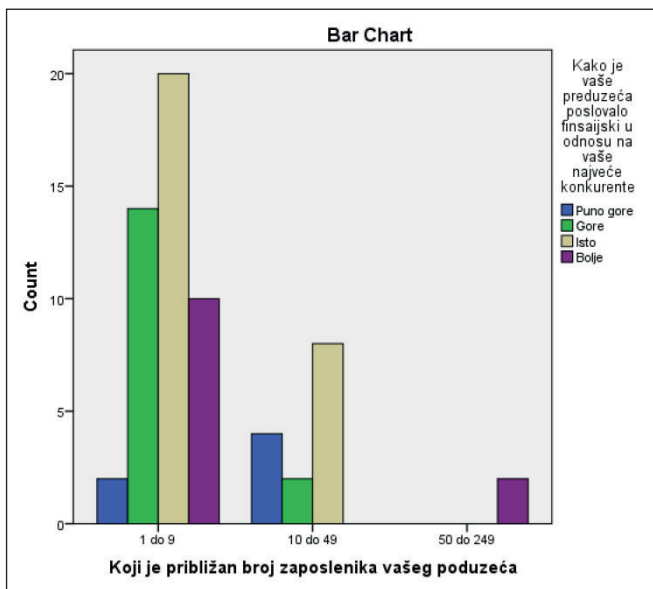
Kada su u pitanju eksterne barijere i njihov utjecaj na poslovanje malih i srednjih poduzeća u vremenu pandemije Covid -19, analiza je pokazala da su njihovi utjecaji veći. Naime, ispitanici su ocijenili da mjere definirane Korona zakonom nisu dovoljne, a prosječna ocjena na skali od 1 do 5 iznosi 3,903. Također, ispitanici smatraju da kreatori Korona zakona nemaju interesa ni volje da se mjere implementiraju i sprovedu. U ovom slučaju prosječna vrijednost je iznad 4. Također, sa prosječnom ocjenom iznad 4, ispitanici su se složili da nema sinergije između Korona zakona i strateških potreba malih i srednjih poduzeća, što je možda i osnovni problem. Na kraju, ispitanici se slažu da su mjere određene Korona zakonom kratkoročnog karaktera, i u ovom slučaju prosječna ocjena je iznosila 4.

Tabela 4. Hi - kvadrat test nezavisnosti između broja zaposlenih i poslovanja u vremenu krize

Koji je približan broj zaposlenika vašeg poduzeća * Kako je vaše preduzeća poslovalo finsaijski u odnosu na vaše najveće konkurente Crosstabulation						
Count						
Puno gore		Kako je vaše preduzeća poslovalo finsaijski u odnosu na vaše najveće konkurente				Total
		Gore	Isto	Bolje		
Koji je približan broj zaposlenika vašeg poduzeća	1 do 9	2	14	20	10	46
	10 do 49	4	2	8	0	14
	50 do 249	0	0	0	2	2
Total		6	16	28	12	62
Hi kvadrat test nezavisnosti		Stavovi ispitanika iz različitih skupina su međusobno nezavisne i različite, jer je $W = 19,268$, $p = 0,004 < 0,05$				

Izvor: obrada autora

Prema rezultatima Hi kvadrat testa, može se zaključiti da postoji značajna statistička razlika između kompanija koje su imale manji ili veći broj zaposlenih po pitanju finasijskog poslovanja preduzeća u odnosu na veće konkurente. Naime, iz dekrativne analize ove analize vidi se da kompanije koje imaju veći broj zaposlenih u manjoj mjeri su osjetili probleme u poslovanju, što je još jedan od dokaza koji pokazuje da je Korona zahvatila u najvećoj mjeri mala poduzeća. Na sljedećem grafičkom prikazu predstavljena je evidentna razlika između kompanija koje imaju manji i veći broj zaposlenih.



Grafikon 4. Hi - kvadrat test nezavisnosti između broja zaposlenih i poslovanja u vremenu krize

Izvor: obrada autora

RASPRAVA I PREPORUKE

U ovom radu se nastojalo empirijskim istraživanjem utvrditi barijere za implementaciju Korona zakona u malim i srednjim poduzećima u Bosni i Hercegovini. Interne barijere za provedbu Korona zakona od strane malih i srednjih poduzeća u Bosni i Hercegovini su: nedostatak identifikacije glavnih problema bila je prepreka u provedbi mjera predviđenih Korona zakonom, neprimjerena raspodjela resursa bila je prepreka u provedbi mjera predviđenih Korona zakonom, nedostatak odgovarajuće predanosti menadžera bila je prepreka u provedbi mjera predviđenih Korona zakonom. Utvrđeno je da su od ponuđenih eksternih barijera imale najveću ocjenu slijedeće varijable: kreatori Korona zakona nemaju interesa ni volje da se mjere implementiraju i sprovedu, nema sinergije između Korona zakona i strateških potreba malih i srednjih poduzeća i mjere određene Korona zakonom su kratkoročnog karaktera. Na osnovu analize eksternih i internih barijera može se zaključiti da su ispitanici ocijenili eksterne faktore kao one koji imaju veći uticaj na trenutno poslovanje kompanija u vremenu pandemije Covid-19, u odnosu na interne faktore. Kod eksternih faktora ocjena ispitanika se kretala oko 4, dok je ocjena kada su u pitanju interni faktori manja od 3.

Na temelju navedenih rezultata istraživanja, potrebno je uspostaviti bolji dijalog i partnerstvo između javnog i privatnog sektor kako bi se adekvatnije riješavale potrebe malih i srednjih poduzeća čineći ih konkurentnijim i održivima. Također, potrebni su učinkoviti sustavi poslovne podrške koji će pružiti pomoć u provedbi predviđenih mjera, te kako bi mala i srednja poduzeća bila sposobna odgovoriti brzo i učinkovito na izazove iz okruženja poput pandemije Covid-19 i time bila produktivnija. S obzirom da ispitanici smatraju kako su mjere kratkoročnog karaktera, potrebno je ponuditi dugoročan i učinkovitiji sustav poslovne podrške koji bi uključio financijske institucije koje su orijentirane na kupca i koje imaju dokazanu sposobnost prodiranja u sektor

malih i srednjih poduzeća. Omogućiti jednostavan i učinkovit zajam dajući prioritet razvoju inovativnih rješenja. Razviti nacionalnu strategiju za razvoj i promociju poduzetništva i koja će zadovoljiti potrebe malih i srednjih poduzeća.

ZAKLJUČAK

U tranzicijskim gospodarstvima uloga malih i srednjih poduzeća (u nastavku MSP) ključna je za održivi rast. Odgovarajuće ekonomsko okruženje stvara priliku za razvoj i povećanje aktivnost MSP-a. Glede blagodati MSP-a ona stvaraju zaposlenje, povećavaju vještine radne snage, poduzetničku kulturu, povećavaju industrijsku proizvodnju i stimuliraju ulazak nove tehnologije. U literaturi, brojne studije navode važnost malog i srednjeg poduzetništva za gospodarski napredak u zemljama u tranziciji (Radovic-Markovic, 2014) i (Gruda & Milo, 2010). Bosna i Hercegovina ima malu, otvorenu ekonomiju s radno intenzivnim industrijama poput poljoprivrede, tekstila i uslužnog sektora. Ekonomija Bosne i Hercegovine uglavnom se sastoji od malih i srednjih poduzeća (MSP). Unatoč tome, sektor malih i srednjih poduzeća zaostaje za europskim zemljama. MSP u BiH osiguravaju približno 70 posto radnih mjesta. MSP se susreće s nizom internih slabosti i ograničenja u vidu niske razine znanja o novim tehnologijama, problemima u pristupu izvorima financiranja, niskom pregovaračkom moći, niskom produktivnošću, nepoznavanjem poduzetničkih vještina i nepostojanjem znanja vezanih za adekvatno upravljanje kadrovima (*Privredni razvoj – politike malih i srednjih poduzeća – Vanjskopolitička inicijativa BH, 2013*). Zbog krize izazvane pandemijom Covid-19, države i njihova poduzeća suočavaju se s glavnim problemima održivosti ljudskih i poslovnih kapaciteta. Iako su vlade donijele politike u području privatnog sektora, postoje ograničenja koja imaju izravne implikacije na potencijal gospodarskog rasta. Pandemija Covid-19 otvorila je nove izazove, ali i mogućnosti za MSP, kao na primjer, tehnološki napredak koji stvara nove proizvode i transformira gotovo svaku fazu poslovanja od proizvodnje do marketinga, nabave i logistike. Trenutno je samo mali dio sektora malih i srednjih poduzeća u stanju prepoznati i iskoristiti te mogućnosti i nositi se s izazovima. Potrebno je osposobiti MSP za bolje suočavanje s izazovima pandemije kako bi ona mogla imati koristi od njenih eventualnih prilika. Rezultati ovoga istraživanja ukazuju na činjenicu kako Korona zakon nije dovoljno dobar. Mjere nisu usklađene sa strateškim potrebama MSP-a, postoji vremensko ograničenje i mjere su kratkoročnog karaktera. Postojanje slabosti i dvosmislenosti u mjerama Korona zakona, neadekvatan odnos strategija malih i srednjih poduzeća s kratkoročnim ciljevima Vlade da pomogne MSP-a, nepravilna konverzija mjera u kratkoročne i operativne planove i raspodjela predviđenih novčanih sredstava, neadekvatna pažnja prema potrebama MSP-a, važne su prepreke u pogledu planiranja i razvoja malih i srednjih poduzeća. Strategija razvoja malih i srednjih poduzeća trebala bi se koordinirati, odnosno, zasnivati na mehanizmu javno-privatnog dijaloga. MSP trebaju poslovne usluge kako bi poboljšale svoju konkurentnost (tj. informacije, savjetovanje, obuku, računovodstvo, pravne usluge, oglašavanje, marketing, tehničke i tehnološke usluge, uključujući ispitivanje standarda i zahtjeve za certificiranje u inozemstvu, nadogradnju proizvoda itd.). Rezultati ovog istraživanja pružaju sliku poslovnih rezultata i očekivanja MSP-a u vrijeme krize, istovremeno nudeći uvid u mjere osmišljene da pomognu oporavku. Rezultati ističu ulogu koju će imati duljina krize u određivanju njezina konačnog utjecaja, koji bi kreatori politike trebali uzeti u obzir dok razmišljaju o razmjeru potrebnih intervencija.

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OBSTACLES TO THE IMPLEMENTATION OF THE CROWN LAW ON THE SMALL AND MEDIUM ENTERPRISE BUSINESS IN BOSNIA AND HERZEGOVINA

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Summary: *In the world economy, small and medium sized enterprises (SMEs) dominate in the number of overall enterprises (90-99% of all enterprises, depending on the definition used) and in economic contributions (GDP growth, productivity, job creation, innovation, level of competition, etc.) (Lundström & Stevenson, 2001). Because small businesses generate jobs, tax revenue, functional products, charitable donations, technological development, and social contributions to communities, their success and sustainability are important for social and economic development. In addition to the impact on public health, coronavirus disease 2019 (COVID-19) caused a major economic shock and the greatest consequences were felt by the small and medium-sized*

enterprises. Due to the crisis caused by the Covid-19 pandemic, countries and their companies are facing major problems of human and business capacities sustainability. Although governments have enacted private sector policies, there are constraints that have direct implications for economic growth potential. In this paper, we investigate the impact of COVID-19 on SMEs in Bosnia and Herzegovina, focusing on the impact of the Law for mitigation negative economic consequences, better known as the Crown-Law. We first examined how the companies performed this year compared to the previous year; and then we examined whether there were barriers to the implementation of the Crown-Law and if so, whether they were internal or external. The results of this research point to the fact that the Crown-Law is not good enough. The measures are not in line with the strategic needs of SMEs, there is a time limit and the measures are short-term. The SME development strategy should be coordinated based on the mechanism of public-private dialogue. SMEs need business services to improve their competitiveness (information, consulting, training, accounting, legal services, advertising, marketing, technical and technological services, including testing standards and certification requirements abroad, product upgrades, etc.). The results of this research provide some information of the business results and expectations of SMEs in times of crisis, while offering insight into measures designed to aid recovery. The results highlight the role that the length of the crisis will play in determining its final impact, which policymakers should consider when considering the scale of interventions needed. On the other side, the Covid-19 pandemic has opened up new challenges, but also opportunities for SMEs, such as technological advances that create new products and transform almost every phase of the business from manufacturing to marketing, procurement and logistics. Currently, only a small part of the SME sector is able to recognize and seize these opportunities and meet the challenges.

Keywords: *strategy; Corona Law; small and medium size enterprises; barriers.*

The JEL Classification: *D23, D81, M21.*



RELATIONSHIP BETWEEN FINANCING AND EFFICIENCY OF INNOVATIVE ACTIVITIES OF INDUSTRIAL ENTERPRISES: EVIDENCE FROM UKRAINE

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Abstract: *The article focuses on the study of the closeness of the relationship obtained from different sources and used in different areas, finance, with the effectiveness of innovation, measured by the number of developed innovative products and the number of introduced new technological processes. The input information was the data of industrial enterprises of Ukraine for the period 2015-2019, summarized in statistical reporting and presented on the official resources of the State Statistics Service. To accomplish these objectives, the methods of correlation-regression analysis and analysis of the dynamics and structure of statistical indicators of innovation of industrial enterprises of Ukraine were used. Possible causes of crisis phenomena of innovative activity of Ukrainian enterprises that hinder the economic development of the national economy are discussed. The basis for further research of complex and individual influence of factors on development of innovative activity of the enterprises of various branches of economy is provided.*

Keywords: *innovation activity; innovation financing; innovative products; new technological process; correlation-regression analysis.*

The JEL classification: *C21, O32*

INTRODUCTION

Ukraine has always positioned itself as a country with high scientific potential. However, during the years of independence, the state has not succeeded to effectively establish macro-innovation policy, promote the development of science at a high level and transform the innovative results of scientists into the latest technologies and developments. For a long time, even methodological issues, such as measuring of innovation activity, have not been remained unresolved in Ukraine.

Despite the rather high scientific potential of Ukraine, which was largely formed during the Soviet Union, the crisis in the country in the 90s (decline in production, rapid inflation, mass unemployment after the collapse of the USSR), then in 2008-2009 (exports, reduced reliability of the banking system due to the global financial crisis), later in 2014-2016 (weak trade policy, unfavorable economic conditions, the development of inflation against the background of hostilities in the east and the annexation of Crimea) and finally in 2020 (GDP decline, unemployment growth caused by the COVID-19 pandemic) have led to a loss of demand for innovative products in the domestic market, due to falling overall investment, rising mutual debt and reorientation of economic activity from the real sector to the sector of rapid return on investment, the nature of government economic policy to support the innovative development of production, the high cost of credit resources of banks and a number of other important factors.

It has long been recognized that innovation is an important factor in determining productivity, competitiveness and economic growth (Dastory, L., 2018). Less access to capital leads to companies from transition economies (including Ukraine) being less productive and less innovative than companies from industrialized countries (Gorodnichenko, Y. & Schnitzer, M., 2010).

Many economists, starting with J. Schumpeter, suggested that it is difficult to finance innovation in a free competitive market, arguing that knowledge about the production of new goods and services as a result of innovative investments cannot be kept secret, which will inevitably lead to impossibility of appropriation income by a firm that makes such investments (Hall, B. H., 2008).

Financial markets play a key role in establishing the dynamics of innovation. Financial intermediaries – such as banks, venture capitalists, private investment companies – redirect capital from where it is stored to where it is needed. The pace of change in innovation depends on both the provision of capital and the mechanisms of proper management (Nicholas, T., 2011).

(Nikonova, Ya. I., 2016), analyzing the dependence of GDP per capita on the level of innovative development, as well as global competitiveness on the level of innovative development in the world, notes that the financing of innovation and innovative development is the basis of economic growth. Proving based on correlation-regression analysis the relationship between the costs of financing the activities of industrial enterprises and the GDP of Ukraine, (Marynenko, N., Fedyshyn, I., Garmatiy, N. & Kramar, I., 2019) conclude that the positive dynamics of increasing the total amount of expenditures to finance innovative activities of industrial enterprises will lead to positive dynamics of Ukraine's GDP, which, at the same time, will improve other economic indicators.

The objective of the study was to establish the closeness of the relationship between the volume of funding for innovation in Ukraine (including in terms of its sources: own funds, state budget, etc.) and its results – the number of developed innovative products and the number of new technological processes, as well as establishing the dependence of the structural distribution of funding sources on the use of funds.

With regards to the organization of the paper, after the brief introduction we provide summarized literature review on the efficiency of innovative activities of industrial enterprises. Furthermore, we proceed to the explanation of the methodology

and the data used to conduct the empirical research. Results section outlines the most important findings together with the interpretation while the paper ends by the concluding remarks section.

LITERATURE REVIEW

In recent years, the amount of literature on innovation financing has been growing rapidly. It focuses on several key themes: 1) the existence of clear evidence of significant limiting factors in the financing of research and development firms, as well as innovation; 2) capital structure, which plays a significant role in the effectiveness of innovation: the priority of bank financing for large companies that have collateral and significant amounts of financing in public markets, but with a set of additional agency costs; 3) growing interest in researching the problems of multi-stage financing; in start-ups, as well as optimizing contracts and policies to stimulate innovation (Kerr, W.R. & Nanda, R., 2014).

Financial systems can influence innovation, both by performing their inherent functions and through various components of their structure, such as markets, institutions and instruments. At the same time, technological innovations can define financial systems, both indirectly, as their specificity requires the emergence of alternative financing solutions, and directly, as technological evolution changes the performance of financial systems and transforms their structure (Deligia, E., 2006).

(King, R.G. & Levine, R., 1993) conducted an empirical study of the relationship between a number of indicators of financial development, entrepreneurship and economic growth. Among other things, they found that more developed financial systems increase the likelihood of successful innovation and thus accelerate economic growth. (Meierrieks, D., 2014) examines the impact of financial development on innovation, using data from 51 countries for the period 1993-2008. There is a direct relationship between the level of financial development and innovation, which indicates the need to take this factor into account when determining national innovation potential.

Firms that do not have barriers to accessing financial resources are often more innovative (Alsharkas, A., 2014). The size of the financial sector and the activities of banks and the stock market are positively related to the number of patent applications filed in East Asian countries (Tee, L.-T., Low, S.-W., Kew, S.-R. & Ghazali, N.A., 2014).

An inverse relationship could be observed. For low-income countries, it is important to use cheap production methods and support technological innovation. Through financial development, economic growth and productivity gains are achieved in the medium term (Dabla-Norris, E., Kersting, E. & Verdier, G.). Encouraging research and development in small firms that have a high, untapped return on innovation can have positive consequences for the growth and development of banks and other financial institutions (Sharma, S., 2007).

At the same time, studies by (Loukil, K., 2020) show the presence of nonlinear effects in the relationship between financial development and innovation. Since the implementation of financial reforms is insufficient to promote innovative development, it is important to create appropriate economic and technological conditions. Moreover, while the development of equity markets stimulates innovation, the development of the credit market hinders innovation, as demonstrated by the empirical data

of 34 developed and developing countries (Hsu, P.-H., Tian, X. & Xu, Y., 2014). The theoretical basis of the nonlinear relationship between finance and innovation is also substantiated by (Law, S.H., Lee, W.C. & Singh, N., 2018).

Innovation activity is influenced not only by the amount of funding, but also by the type of finance received, which is related to four basic characteristics of innovation: uncertainty – funding is characterized by high risks; long-term nature and cumulativeness – funding should be long-term; collectivity – involves several forms of finance from various public and private sources (Mazzucato, M. and Semieniuk, G., 2017). The development of different forms of funding can stimulate investment in research and development in different ways (Maskus, K.E., Neumann, R. & Seidel, T., 2012).

Thus, modern scientific research does not provide a clear answer to the question of the existence and closeness of the relationship between the results of innovation and the amount and structure of its funding. The purpose of our study is achieved by confirming (or refuting) three hypotheses:

H1: there is a direct close connection between the amount of attracted funding for innovation activities (innovation costs) for industrial enterprises of Ukraine and the number of innovative types of products mastered by them.

H2: there is a direct close connection between the amount of attracted funding for innovation activities (innovation costs) for industrial enterprises of Ukraine and the number of new technological processes introduced by them.

H3: there is a high level of determinedness of the resulting indicators of innovation (the number of developed by Ukrainian enterprises of innovative products, the number of new technological processes implemented by industrial enterprises of Ukraine) structural factors of financing innovation in terms of sources and costs of innovation in terms of spending.

DATA AND METHODOLOGY

To study the closeness of the relationship between indicators of innovation financing (innovation costs) and performance indicators of innovation, which selected the number of developed innovative products and the number of introduced new technological processes, used the tools of correlation and regression analysis.

Regression analysis provides information about the relationship of the original variable with one or more independent variables insofar as such information is contained in the database. The relevance and accuracy of the conclusions depend on the data used: data that are not representative or improperly collected can lead to inadequate and erroneous conclusions (Gunst, R.F. & Mason, R.L., 1980). In the presented study we used data collected by the State Statistics Service of Ukraine and contained in the public domain on the official website of the organization www.ukrstat.gov.ua. At the same time, we assume the presence of errors in the results obtained related to the collection and processing of data used by statistical authorities.

To assess the current state and dynamics of changes in the effectiveness of innovation during the period from 2015 to 2019 in Ukraine, we will analyze them in relation to other macroeconomic indicators: the number and share of industrial enterprises that have implemented innovations; the share of sold products in the volume of industrial; composition and structure of innovation funding sources; composition and structure of the use of borrowed funds (costs of innovation).

All calculations and their visualization were performed using the “Analysis Package” tool of the “Data Analysis” add-on of the Microsoft Excel application package.

From those given in table 1 and fig. 1 indicators we see that although during 2015-2019 the number of industrial enterprises of Ukraine that implemented innovations increased in absolute terms from 723 to 782 units, their share in the total number of industrial enterprises for the analyzed period decreased from 15,2 % to 13,8 %, which is extremely low compared to developed countries, where the share of industrial enterprises that implement innovations is 60-70 %.

Table 1. The main indicators of innovative activity of the industry of Ukraine

Indexes Years	Number of innovatively active industrial enterprises, units	The share of innovatively active industrial enterprises, %	The share of innovative industrial products in the total sales of industrial enterprises, %	Innovative products mastered in the reporting year, units	New technical processes introduced in the reporting year, units	
					Total	Of these: low-waste, resource-saving
2015	723	15,2	1,4	3136	1217	458
2016	735	16,6	—*	4139	3489	748
2017	759	14,3	0,7	2387	1831	611
2018	777	15,6	0,8	3843	2002	926
2019	782	13,8	1,3	2148	2318	857

* The calculation of the indicator in this period was not carried out

Source: State Statistics Service of Ukraine (Economic statistics, 2020)

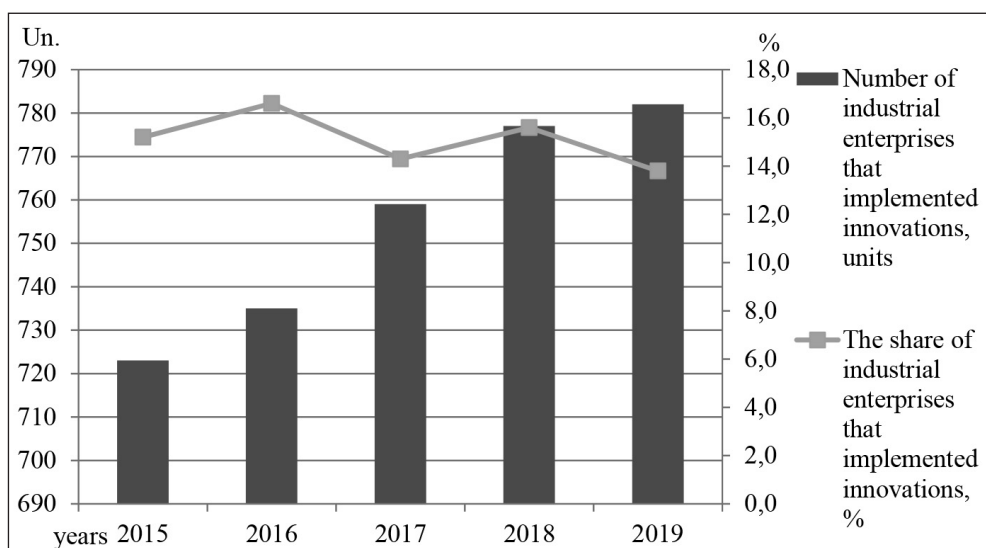


Figure 1. Dynamics of the number of industrial enterprises that implemented innovations and their share in 2015-2019

Source: formed by the authors on the basis of official statistics (Economic statistics, 2020)

Analysis of the number of developed innovative products and introduced new technological processes by industrial enterprises of Ukraine, including low-waste, resource-saving (table 1 and fig. 2) showed that during the analyzed period the number of developed innovative products decreased by 988 units, or 31,51 %. At the same time, the number of introduced new technological processes for the same period has almost doubled, namely from 1217 to 2148 units. The result of the positive dynamics of some analyzed indicators during 2015-2019 is a gradual economic growth after the crisis of 2013-2014.

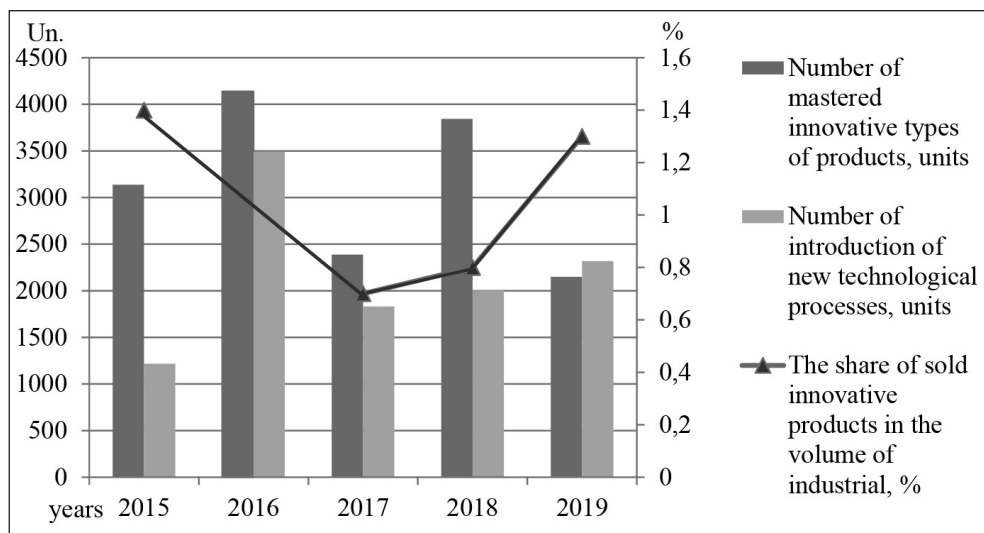


Figure 2. Dynamics of implementation of new technological processes and innovative types of products and their share in the volume of industrial for 2015-2019

Source: formed by the authors on the basis of official statistics (Economic statistics, 2020)

The result of the gradual formation and consolidation in Ukraine of the economic model, which is based, as a rule, on low-tech industries and systems, was the deepening of the trend of dominance of industries with low knowledge intensity in the industry of the state. This, at the same time, was reflected in the share of sold innovative products in the volume of industrial, which, as can be seen from table 1 and fig. 3, during the analyzed period ranged from 0,7 to 1,4 percent.

Analyzing the dynamics of the indicators listed in table 1 and fig. 3, we observe that the periods of decrease and increase of these indicators did not always coincide with each other, sometimes showing even opposite tendencies. Therefore, we come to the conclusion that innovation activity at industrial enterprises of Ukraine is carried out chaotically, unstructured, the dynamics of innovation processes is unstable, and in many cases irrational. This is confirmed by the fact that over a short period of time, certain indicators of innovation activity in Ukrainian industry show oppositely different development trends.

According to the current legislation of Ukraine, innovative development in the country is provided through funding from various sources. These include scholars and Ukrainian legislation, including own funds, state and local budgets, extra-budgetary

funds, funds of Ukrainian and foreign investors, as well as credit funds and funds from other sources. The Law of Ukraine “On Scientific and Scientific-Technical Activity” states that one of the main levers of state policy in the field of scientific and scientific-technical activity is budget funding. And article 34 of this Law states that the state must provide budget funding for scientific and scientific-technical activities, in addition to defense expenditures, in the amount of not less than 1,7 % of Ukraine’s GDP. However, despite the legislative regulation of the financing of scientific and scientific-technical activities, the established norms of budget financing of these areas are not observed. It should be noted that, according to experts, the level of R&D funding in Ukraine in recent years has come very close to the level of Soviet spending in the early 1950s. Moreover, the annual actual needs for scientific, technical and innovative activities in Ukraine are met by not more than 16 %.

Thus, the main source of funding for innovation in Ukrainian industry remains the own funds of enterprises. Their superiority among other sources of financing of innovation is due to the insufficiently clear and overly complex process of attracting financial resources due to the unfavorable investment climate and underdeveloped venture financing of innovation. The distribution of the volume of financing of innovative activity in the industry of Ukraine by sources is given in table 2 and graphically shown in fig. 3.

Table 2. Distribution of the volume of financing of innovative activity in the industry of Ukraine by sources for 2015-2019

Source financing	Years	2015	2016	2017	2018	2019
Total funding	UAH million	13813,7	23229,5	9117,5	12180,1	14220,9
	%	100	100	100	100	100
At their own expense	UAH million	13427,0	22036,0	7704,1	10742,0	12474,9
	%	97,20	94,83	84,50	88,19	87,72
At the expense of the state budget	UAH million	55,1	179,0	227,3	639,1	556,5
	%	0,41	0,80	2,50	5,25	3,91
At the expense of funds foreign investors	UAH million	58,6	23,4	107,8	107,0	42,5
	%	0,41	0,1	1,20	0,88	0,30
At the expense of funds other sources	UAH million	273,0	991,1	1078,3	692,0	1147,0
	%	1,98	4,27	11,80	5,68	8,07

Source: formed by the authors on the basis of official statistics (Economic statistics, 2020)

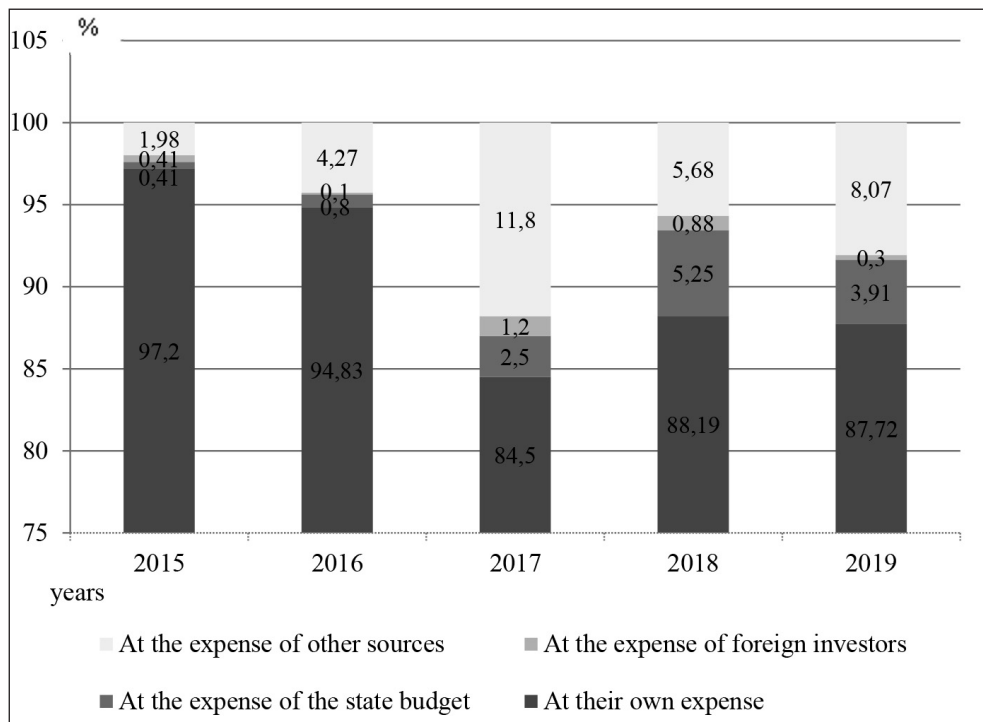


Figure 3. Dynamics of the structure of financing innovation by sources for 2015-2019

Source: formed by the authors on the basis of official statistics (Economic statistics, 2020)

Analyzing the indicators given in table 2 and fig. 4, we see that the share of own funds in the total funding of innovation activities at industrial enterprises of Ukraine fluctuated during 2015-2019 in the range of 84-98 %.

The situation with budget financing of innovation activity in the national industry remains extremely difficult. During the analyzed period, the share of the state budget in the total funding of innovations at industrial enterprises of Ukraine did not exceed 5,25 % (2018). This is much less than in the developed world, where government spending on innovation is 7-15 % of the total. The exception is Japan, where the vast majority of investment in innovation (about 97 %) is provided by industrial companies (Babinska, S., Boychuk, A., 2020).

The next largest source of funding for innovation in Ukraine is the funds of foreign investors. However, the share of this source of funding still remains insignificant. The lowest level of foreign investment in national industry innovation was observed in 2016 and amounted to 23,4 UAH million, or 0,1% of total funding. In all other years of the analyzed period, the share of financing of innovations in the national industry at the expense of foreign investors ranged from 0,4 % to 1,2 %.

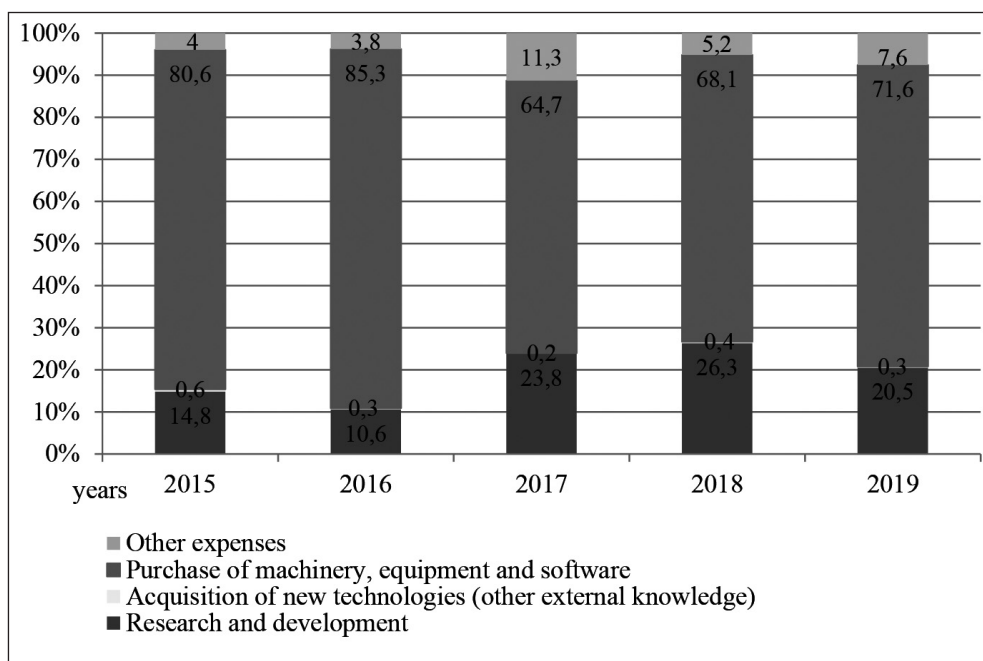
The results of the analysis show that the financing of innovation activity in the industry of Ukraine is carried out at an extremely low level. The main part of this financing is the own funds of enterprises.

The results of the study on the volume and share of costs of Ukrainian industrial enterprises in the areas of innovation are given in table 3 and fig. 4.

Table 3. Distribution of total expenditures by areas of innovation for 2015-2019

Costs	Years	2015	2016	2017	2018	2019
Total costs	UAH million	13813,7	23229,5	9117,5	12180,1	14220,9
	%	100	100	100	100	100
Including by areas:						
Research and development	UAH million	2039,5	2457,9	2169,8	3208,08	2918,9
	%	14,8	10,6	23,8	26,3	20,5
Acquisition of new technologies (other external knowledge)	UAH million	84,9	64,2	21,8	46,1	37,5
	%	0,6	0,3	0,2	0,4	0,3
Purchase of machinery, equipment and software	UAH million	11141,3	19829,0	5898,8	8291,3	10185,1
	%	80,6	85,3	64,7	68,1	71,6
Other expenses	UAH million	548,0	878,4	1027,1	633,9	1079,4
	%	4	3,8	11,3	5,2	7,6

Source: formed by the authors on the basis of official statistics (Economic statistics, 2020)

**Figure 4.** The structure of total expenditures by areas of innovation for 2015-2019

Source: formed by the authors on the basis of official statistics (Economic statistics, 2020)

As can be seen from table 3, the largest share in the total expenditures in the areas of innovation of national industrial enterprises are the purchase of machinery, equipment and software. During the analyzed period, it never fell below 64 %, moreover, there was a tendency to increase this indicator. Thus, if in 2017 the share of costs for the purchase of machinery, equipment and software was 64,2 % of the

total cost of innovation in Ukrainian industry, in 2019 it increased to 71,6 %. In 2015 and 2016, this figure was a record 80,6 % and 85,3 %, respectively, in the total cost of innovation of Ukrainian industrial enterprises.

At the same time, the costs of industrialists for research and development for the analyzed period are much lower than their costs for the purchase of machinery, equipment and software. Thus, the share of research and development costs in the industry of Ukraine for the analyzed period ranged from 10-27 %, which is extremely insufficient for the development of innovation.

The costs of industrial enterprises for the acquisition of new technologies (other external knowledge) were even lower. These costs include, but are not limited to, the acquisition of exclusive property rights to inventions, utility models, industrial designs, licenses, and license agreements for the use of such facilities. The share of such expenditures was the smallest in the structure of the total expenditures on innovations in the national industry and showed a decreasing trend. If in 2015 the share of expenditures for the acquisition of new technologies (other external knowledge) was 0,6 %, in 2019 it decreased by half – to 0,3 %.

The level of innovation activity of industrial enterprises is related to the size of the enterprise. More than two-thirds of enterprises that spent on innovation in industry had more than 1,000 employees. If we take into account enterprises engaged in innovation, with more than 500 employees, their share in the total number of industrial enterprises that spent money on innovation exceeds 85 %. This is explained by the fact that innovations in the national industry of Ukraine are engaged mainly in large, economically strong enterprises that have sufficient financial, intellectual and human resources.

EMPIRICAL RESULTS

The use of correlation-regression analysis allowed to qualitatively assess the statistical relationship between a set of factors (grouped by source of funding and direction of use of funding) and the resulting indicators – the number of developed innovative products and the number of implemented technological processes (table 4).

Table 4. The results of regression analysis of the relationship between the effectiveness of innovation and innovation financing in Ukraine for the period 2015-2019

Influence factor, UAH million	The resulting indicator is the number of developed innovative types of products (IP), units			The resulting indicator is the number of implemented new technological processes (TP), units		
	Coefficient of determination (R-square)	Y-section	Variable X1	Coefficient of determination (R-square)	Y-section	Variable X1
Total funding (TF)	0,386	1638,5	0,103	0,658	298,18	0,129
Own funding (OF)	0,409	1748,3	0,104	0,573	598,73	0,118
Financing from the state budget (FB)	0,008	3233,9	-0,312	0,009	2068,76	0,310
Financing at the expense of foreign investors (FI)	0,027	3384,0	-3,734	0,331	3028,70	-12,633

Funding from other sources (FS)	0,120	3833,9	-0,841	0,365	992,32	1,410
Research and development (RD) costs	0,029	2366,3	0,299	0,069	1030,84	0,446
Costs for acquisition of new technologies (other external knowledge) (NT)	0,279	2169,5	18,882	0,006	2303,25	-2,590
Costs for the purchase of machinery, equipment and software (ME)	0,393	1987,0	0,103	0,585	829,51	0,121
Other costs of innovation activity (IA)	0,348	4953,3	-2,187	0,181	907,70	1,516

Source: calculated by the authors on the basis of the data summarized in table 1, 2 and 3 using the tools of correlation and regression analysis

The unadjusted multiple regression coefficient estimates the proportion of variation in the result due to the factors presented in the regression equation in the total variation of the result. The study showed a moderate relationship between the amount of funding (innovation costs) and the number of developed innovative products (share of variation – 38,6 %), as well as a noticeable but weak correlation between this factor and the number of new technological processes (the share of variation is 65,8 %). The closest connection with the resulting indicators in the structure of funding sources have their own funds: 40,9 % of the variation in the number of developed innovative products is explained by the variation of this factor variable; for the resulting indicator of the number of introduced new technological processes, this impact was 57,3 %. The closest connection with the resulting indicators in the structure of costs for innovation is observed in the indicator of costs for the purchase of machinery, equipment and software: 39,3 % for IP and 58,5 % for TP.

To assess the significance or significance of the value of the correlation coefficient by the Student's t-test, we put forward the null hypothesis: the correlation coefficient of the general population is 0, and the studied factor does not affect the performance indicator. The critical value (t_{cr}) In the set of Student's t-distribution coefficients at the level of significance $\alpha = 0,05$ and the number of degrees of freedom $df = 3$ for the bilateral critical region is 2,353. Comparing the calculated value of the t-test (1,37 to assess the impact on the indicator of IP; 2,4 to assess the impact on the indicator of TP) with the critical, we observe the lack of statistical significance of the coefficient in the regression equation with the resulting indicator of the number of developed innovative products, the presence of statistical significance when changing the resulting indicator on the number of introduced new technological processes. A similar analysis for the structural elements of funding sources and areas of expenditure showed their statistical insignificance of their correlation (the largest calculated value of the t-test is 2,01 for the indicator of the amount of funding from own funds). Thus, the analysis and forecast

can be based only on a certain reliability of the coefficients of the regression equation to describe the relationship between TP and TF.

This is also confirmed by the probability of random values of the regression equation: the acceptable level of α is 0,05, while its value for individual components of the indicator of funding and innovation costs reaches 0,88. This allows us to consider the decomposition of these indicators as uninformative to establish the influence of factors on the result.

The visual representation of the correlation field and the constructed trend line on regression models of interdependence of factors (financing and costs of innovations) and indicators of efficiency of innovative activity of industrial enterprises of Ukraine are shown in fig. 5 and fig. 6.

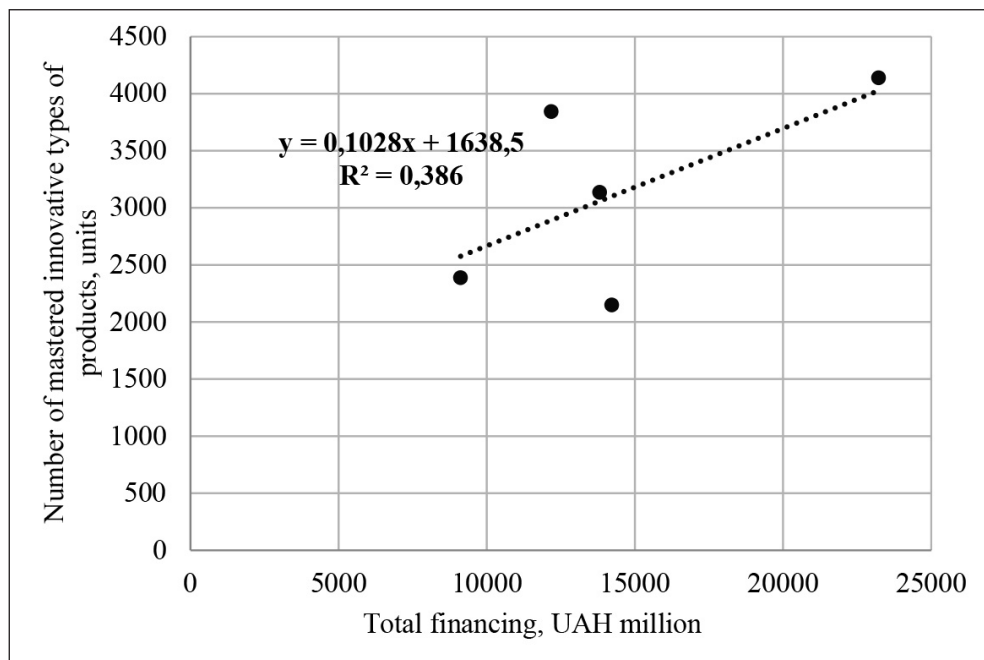


Figure 5. The relationship between the number of developed innovative products and funding in Ukraine in 2015-2019

Source: constructed by the authors on the basis of the data summarized in table 1, 2 using the tools of correlation and regression analysis

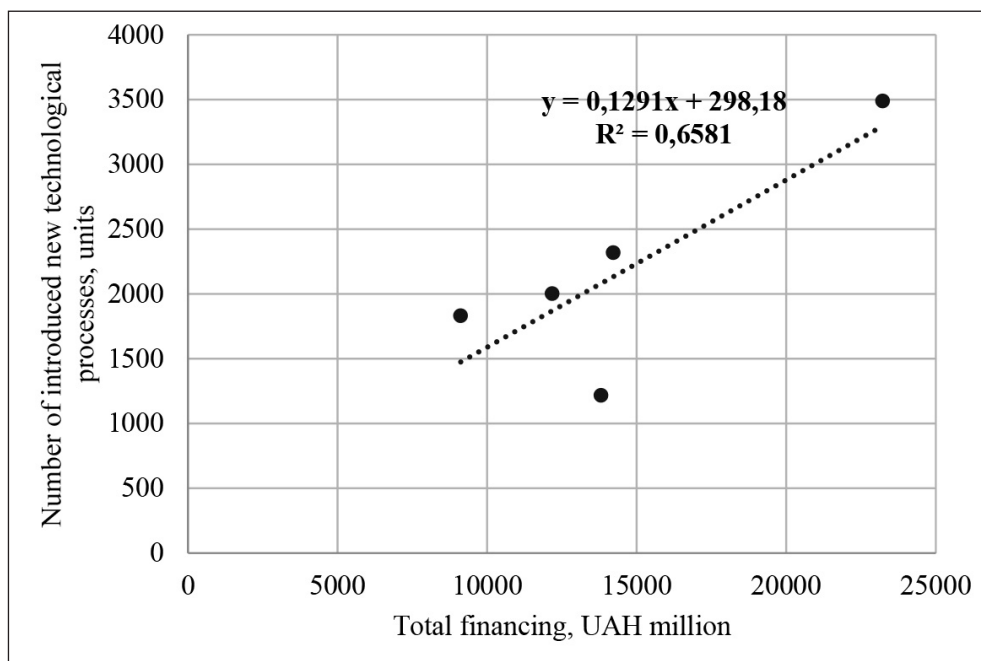


Figure 6. The relationship of the number of introduced new technological processes with the amount of funding in Ukraine in 2015-2019

Source: constructed by the authors on the basis of the data summarized in table 1, 2 using the tools of correlation and regression analysis

The problem of inadequate level of innovation activity in the national industry and low level of innovation activity of Ukrainian industrial enterprises has a systemic character and is mainly due to the general principles of organization of socio-economic activity of Ukraine. The country has not defined strategic goals and objectives of innovative development, has not implemented long-term and medium-term forecasting and planning of socio-economic development, as provided for in developed countries and EU countries. The system of competitive financing as the main mechanism of financing science and innovation has been lost.

The legislative framework, which has undergone significant changes in recent years, has not contributed to the development of innovative activity in the national industry in particular and in Ukraine in general. Legislation in the field of science and technology, which was mainly developed in the 90s of last century, provided the legal basis for the effective development of Ukrainian science and economy in the future, as evidenced by indicators of innovation in national industry, given in table 1-3 and fig. 1-4. At the same time, the innovative activity of industrial enterprises began to decline during the previous decade, mainly due to the underdevelopment of the intellectual property market in Ukraine, low implementation rate of applied developments, as well as unjustified and economically impractical changes to existing legislation in innovation and research (Babinska, S., Boychuk, A., 2020).

CONCLUSION

The study concludes that there is a low level of direct relationship between funding indicators (as well as the cost of innovation) and the number of developed innovative products, as well as the average closeness of the relationship between innovation funding and the number of new technological processes in Ukraine. There is also a low level of determinedness of the resulting indicators in the models by factors of individual sources of funding and areas of use of innovation costs. Thus *H1* was not confirmed, *H2* was partially confirmed, *H3* was not confirmed. The authors suggest, this is due to three main reasons: 1) the risk of innovation; 2) the duration of the life cycle of innovation development 3) the fragmentary financing of innovation projects, which is often manifested in the absence of effective methods for determining promising innovation developments. Also, the assumption about the direct relationship between the results of innovation and the use of borrowed funds in the national economy of Ukraine has not been confirmed. The structural distribution of funding sources and areas of its use does not have a significant impact on the number of developed innovative products and introduced new technological processes in Ukraine over the past 5 years. The least determined for the resulting indicators of innovation in Ukraine is the factor of financing from the state budget, which may indicate both the shortcomings of the mechanism of budget financing of innovation in the country, which is not result-oriented, and the use of funds, which mainly relate to high-risk stage of research in the structure of the innovation cycle.

The critical state of the Ukrainian scientific, scientific-technical and innovation sphere is largely due to the lack of an effective system of public administration of science and innovation, which would responsibly defend compliance with legislation and modern needs of the national innovation system, ensure its interaction with production, coordinate research and developments. Ensuring the competitiveness and high level of innovation of national industry through the activation of scientific, technical and technological potential is one of the most important strategic goals that Ukraine sets for itself in modern conditions.

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ALGORITAM OPTIMIZACIJE ALOKACIJE RESURSA U CILJU ISPITIVANJA EKONOMSKIH EFEKATA REAGOVANJA MODELA LINEARNOG PROGRAMIRANJA

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Sažetak: *Koncepcija ispitivanja odluka upotrebom apstraktnih istraživačkih konstrukcija kao virtuelnih pomagala, omogućava oblikovanje upravljačke platforme i kreiranje ponašanja budućeg stanja sistema. Provjera efekata odluka u realnom sistemu preko odgovarajućeg matematičko-logičkog aparata svakako utiče na smanjenje slučajnosti i stihijnosti upravljanja. Dakle, matematički model predstavlja formalizovan opis dejstva fizičkih sadržaja, a koristimo ga kao podršku procesu odlučivanja kada to dozvoljava složenost realiteta. Shodno tome, a u cilju izražavanja zakonomjernosti funkcionisanja, u ovom radu je korišten deterministički model linearnog programiranja u vidu skupa odnosa koji opisuju ulazno-izlazno dejstvo uticajnih faktora. Uz tolerantno pojednostavljivanje stvarnosti percepcija modela, zasnovana na podudarnosti sa strukturom originala, zapravo pokazuje aproksimaciju koja znači analogno ponašanje što je demonstrirano na kvantitativnom modelu odnosno njegovom derivatu – modelu optimizacije. Navedena teza ide u prilog činjenici da korespondentan odnos modela i originala omogućava ispitivanje ponašanja posmatranog hipotetičkog sistema, a sama analiza mape senzitivnosti reagibilne promjenjive, u obliku funkcije cilja, postaje izvor generisanja modeliranih informacija. Takođe, sistem nije pod uticajem visoke stope promjena koje bi značile proširivanje sa determinističkog na stohastičko modeliranje ali se ipak mobilisu svi metodološki resursi kako modelska koncepcija ne bi postala teorijska zablude što bi vodilo kvazi odlučivanju. Analitičnost i logika autora nastoje dati šansu imaginaciji koja dovodi u vezu kreativnost i fizičke resurse što ukazuje na više alternativa koje u sebi sadrže buduće veličine. Time autori modelom kao prirasotom znanja omogućavaju povezivanje apriorne upravljačke rezerve o vlastitoj tačnosti sa realnosti hipotetičkih podataka u okviru racionalnog pristupa.*

Ključne riječi: *modeliranje; simplex metod; optimizacija alokacije resursa; analiza osjetljivosti; QM softver.*

JEL klasifikacija: C44.

UVOD

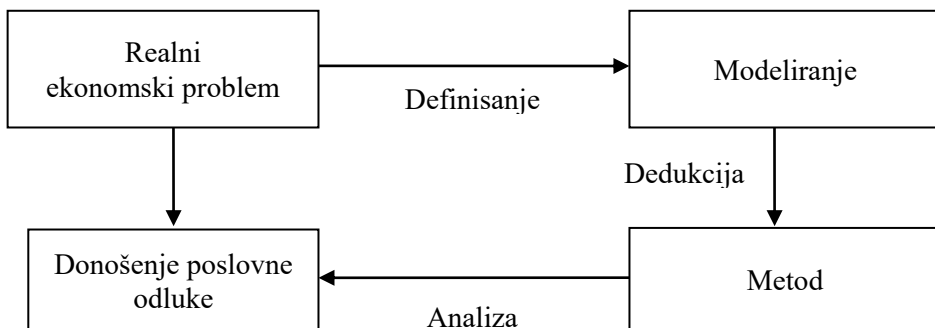
Ograničenost resursa podstakla je stvaranje i razvoj takvih sistema u kojima glavnu ulogu ima čovjek sa vještinama njihove optimalne raspodjele i efikasnog korištenja. Racionalno korišćenje resursa i njihova alokacija u poslovnim sistemima, struktura i procesi unutar organizacionih dijelova i sl. su pitanja koja obuhvataju organizacione nauke, sa operacionim istraživanjima. Široka praktična primjena linearnog programiranja u svim privrednim aktivnostima je razlog zbog koga koristimo ovu metodu u daljem radu. Kroz primjer primjene modela optimizacije proizvodnog programa preduzeća „X“ moguće je formalizovati konstrukt linearnih nejednačina kao sistem koji predstavlja instrukciju povezivanja i opisa linearnog ponašanja u znaku matematičkog odigravanja budućnosti. Prilikom formulisanja modela, neophodno je imati u vidu originalan problem i tačnost definisanja kriterija optimalnosti iz kojeg se izvodi funkcija cilja koja se želi postići uz postojeća ograničenja. Formiranje matematičkog modela zasniva se na činjenici da će, u granicama aproksimacije, imati proračunljivo ponašanje zbog poznavanja algoritma prerade informacija, a time i preciznost upravljačkog ishoda. Savremene primjene optimizacionih tehnika baziraju se na korištenju informacionih tehnologija, a rast preduzeća će zavisiti od toga da li ih primjenjuju u budućnosti (Đokić, Đokić, & Jovičić, 2020). Matematičke metode koje bi zbog složenosti i mnoštva podataka kao odraza realnosti imale samo teorijsku vrijednost, zahvaljujući informaciono komunikacionoj tehnologiji i modernim softverima postale su gotovo univerzalno primjenjive. U prvom dijelu rada date su teorijske postavke modela, nakon čega je prikazan matematički model opisanog problema. U nastavku rada primjenjen je model linearnog programiranja u svrhu optimizacije proizvodnog programa, dok se posljednji dio rada bavi zaključnim razmatranjima.

TEORIJSKA POZICIJA MODELA

Matematički model se kreira radi obavljanja istraživačkih zahvata u okviru kvantitativne analize nekog sistema iz realnog svijeta. Kako je riječ o kvantifikaciji realnog svijeta, teško je, ali ne i nemoguće, tačno prenijeti realni ekonomski problem u formu matematičkog modela. Ipak, postupak modeliranja zahtjeva određeno iskustvo, intuiciju, kao moć imaginacije stvarnosti u pojednostavljenoj formi, dobro poznavanje zakonitosti koje se javljaju u različitim vezama među posmatranim pojavama, analitičnost i poznavanje tehnika i metoda. Isto tako, potrebno je sagledati veze internih i eksternih faktora, čime proces optimizacije dobija potpun smisao (Landika, Bajić, & Sredojević, 2020).

Prilikom izrade modela, unose se one veličine i veze koje su bitne za pronalazak optimalnog rješenja problema, a manje bitne informacije i međusobne zavisnosti zanemaruju. Uvijek treba težiti tome da se procesi učine jasnim, uz zadržavanje tradicionalne nomenklature (Fletcher, 2010)

Rješavanjem modela generišu se modelirane informacije o ponašanju, a dobijene rezultate treba adekvatno interpretirati da bi bili upotrebljivi u realnom svijetu. Na taj način se dolazi do formulisanja elemenata za donošenje stvarne odluke. Proces modeliranja modeliranja možemo predstaviti slikom 1.



Slika 1. Proces modeliranja

Izvor: Prikaz autora

MATEMATIČKA POSTAVKA MODELA OPTIMIZACIJE PROIZVODNOG PROGRAMA

Formulacija problema predstavlja početnu i najznačajniju fazu kvantitativne analize. Ovo je ujedno i najteža faza ukupne kvantitativne analize, zbog čega se i kaže da dobro formulisan problem možemo smatrati polovinom procesa primjene modela za donošenje optimalnih poslovnih odluka (Backović, Vuleta, & Popović, 2018).

Pretpostavimo da se u proizvodnji proizvoda, koriste mašine, radnici, sirovine i materijali, pri čemu je poznata dobit koja se ostvaruje po jedinici svakog proizvoda. Potrebno je odrediti optimalni program proizvodnje da bi se ostvarila najveća moguća dobit u poslovanju.

Ostvarenju cilja tj. dobiti prethodi zadovoljenje sistema ograničavajućih faktora. Ograničenje je logička veza između varijabli koje uzimaju vrijednosti iz svojih domena. Ona prirodno, razumljivo i jasno formulišu međusobne zavisnosti u fizičkom svijetu i njegovoj matematičkoj apstrakciji (Vujošević, 2012).

Da bi zapisali opšti oblika modela linearnog programiranja koristićemo slijedeće veličine:

x_j – varijable, $(j = 1, 2, \dots, k)$,

c_j – koeficijenti uz varijable u funkciji cilja,

z – funkcija cilja,

a_{ij} – koeficijenti uz varijable u sistemu ograničenja,

a_{io} – slobodni članovi iz sistema ograničenja, $(i = 1, 2, \dots, m)$.

Za izračunavanje efektivnih kapaciteta pojedinih mašina (slobodni članovi sistema ograničavajućih faktora) koristiće se slijedeća formula (Stanić, 1997):

Formula 1. Izračunavanje efektivnih kapaciteta pojedinih mašina

$$H\check{c}_{(e)} = \{ [Hd_{(k)} - (Hd_{(np)} + Hd_{(i)})] \times Bs \times H\check{c}_{(d)} - H\check{c}_{(pc)} \} \times [100 - (P_{(tk)} + P_{(pp)})] / 100,$$

Izvor: (Stanić, S. 1997) i dopuna autora

gdje je:

$H\check{c}_{(e)}$ – vrijeme efektivnog rada mašine (u satima),

$Hd_{(k)}$ – kalendarski fond dana (u godini),

$Hd_{(np)}$ – broj nedelja i praznika,

$Hd_{(i)}$ – broj dana investicionog održavanja,

Bs – broj smjena,

$H\check{c}_{(d)}$ – broj sati u smjeni,

$H\check{c}_{(p\check{c})}$ – broj sati za **čišćenje** i održavanje mašine,

$P_{(tk)}$ – procenat gubitka od maksimalnog fonda radnog vremena mašine zbog tehničkih kvarova i zastoja,

$P_{(pp)}$ – procenat gubitka od maksimalnog fonda radnog vremena mašine zbog prelaska sa jedne mašine na drugu.

Na osnovu svega ranije navedenog, može se formirati matematički model koji sadrži zahtjev da se nađu takve vrijednosti varijabli $x_j, (j = 1, 2, \dots, k)$ koje će obezbijediti da funkcija cilja, uz data ograničenja, dobije maksimalnu vrijednost. Matematički model glasi:

Funkcija cilja:

$$(\max); z = \sum_{j=1}^k c_j x_j$$

uz sistem ograničavajućih faktora:

$$\sum_{j=1}^k a_{ij} x_j \leq a_{io}, \quad (i = 1, 2, \dots, m),$$

$$x_j \geq 0, \quad (j = 1, 2, \dots, k).$$

Problem rješavamo simpleks metodom, konkretno njenim algoritmom simpleks tabelom. Simpleks metoda je matematički pristup rješavanju problema linearnog programiranja. To je standardni metod rješavanja problema koji uključuje više od dvije promjenljive (Thomas, 2007).

APLIKACIJA MODELA LP U SVRHU OPTIMIZACIJE PROGRAMA PROIZVODNJE (HIPOTETIČKI PRIMJER)

U nastavku analiziramo 4 proizvoda koji čine najveći dio proizvodnje preduzeća „X“ u okviru brenda „S“, pa su zbog toga i najinteresantniji za samu analizu. To su:

Proizvod „A“ – 8,94 % proizvodnje

Proizvod „B“ – 6,1 % proizvodnje

Proizvod „V“ – 3,628% proizvodnje i

Proizvod „G“ – 6,846% proizvodnje.

Navedene četiri vrste proizvoda predstavljaju dio iste proizvodne linije, ali je njihovo pojedinačno učešće i značaj za brend različit, te smo ih zbog toga posebno

razmatrali. Iako naizgled ovi procenti ne izgledaju veliki, kada se uzme u obzir postojanje više brendova i diverzifikovane proizvodnje, te sam broj proizvoda koje preduzeće „X“ proizvodi i prodaje, ovi procenti imaju smisla.

S obzirom na prethodno, realne (strukturne) varijable u modelu koji ćemo formirati imaju slijedeće značenje:

- x_1 - Proizvod „A“,
- x_2 - Proizvod „B“,
- x_3 - Proizvod „V“,
- x_4 - Proizvod „G“,

a iste, po svojoj prirodi, ne mogu biti negative. Sistem ograničavajućih faktora obuhvata kapacitete sredstava za rad i raspoloživo tržište kao ograničavajući faktor.

Mašine, čiji ćemo kapacitet koristiti kao prvi ograničavajući faktor, dati su u tabeli br.1¹:

Tabela 1. Kapaciteti sredstava za rad

Mašina	Proizvod „A“	Proizvod „B“	Proizvod „V“	Proizvod „G“	Radni kapacitet (u časovima)
MAŠINA 1	0,0038889	0,0038889	0,098211	0,098211	16
MAŠINA 2	0,0033333	0,0033333	0,001234	0,001234	16
MAŠINA 3	0,1666667	0,1666667	0,243429	0,243429	16
MAŠINA 4	0,0047222	0,0047222	0,0944376	0,654324	8
MAŠINA 5	0,5000000	0,4500000	0,1035321	0,1035321	16
MAŠINA 6	0,0043211	0,0059888	0,0027778	0,0027778	16
MAŠINA 7	0,0074356	0,0012342	0,0016667	0,0053333	3
MAŠINA 8	0,0021111	0,0011222	0,0021343	0,0013889	3
MAŠINA 9	0,0654323	0,0739999	0,3333333	0,3000000	16
MAŠINA 10	0,0021111	0,0094444	0,1666667	0,1666667	16

Izvor: Dopuna autora

Na osnovu raspoloživih podataka, moguće je postaviti slijedeća ograničenja:

- 1) $0,0038889 x_1 + 0,0038889 x_2 + 0,098211 x_3 + 0,098211 x_4 \leq 960$
- 2) $0,0033333 x_1 + 0,0033333 x_2 + 0,001234 x_3 + 0,001234 x_4 \leq 960$
- 3) $0,1666667 x_1 + 0,1666667 x_2 + 0,243429 x_3 + 0,243429 x_4 \leq 960$
- 4) $0,0047222 x_1 + 0,0047222 x_2 + 0,094437 x_3 + 0,654324 x_4 \leq 480$
- 5) $0,500000 x_1 + 0,450000 x_2 + 0,103532 x_3 + 0,103532 x_4 \leq 960$
- 6) $0,004321 x_1 + 0,0059888 x_2 + 0,0027778 x_3 + 0,0027778 x_4 \leq 960$

¹ Tehnološka dokumentacija preduzeća „X“.

- 7) $0,007435 x_1 + 0,001234 x_2 + 0,0016667 x_3 + 0,0053333 x_4 \leq 180$
- 8) $0,002111 x_1 + 0,0011222 x_2 + 0,0021343 x_3 + 0,0013889 x_4 \leq 180$
- 9) $0,065432 x_1 + 0,0739999 x_2 + 0,3333333 x_3 + 0,3000000 x_4 \leq 960$
- 10) $0,002111 x_1 + 0,0094444 x_2 + 0,1666667 x_3 + 0,1666667 x_4 \leq 960$

Podaci o raspoloživom tržištu, kao drugom ograničavajućem faktoru, ekonomskog modela dati su u tabeli br. 2.²

Tabela 2. Podaci o raspoloživom tržištu

Proizvod	Realna varijabla	Raspoloživo tržište (broj komada)
Proizvod „A“	X_1	16.810
Proizvod „B“	X_2	24.276
Proizvod „V“	X_3	18.227
Proizvod „G“	X_4	13.662

Izvor: Dopuna autora

Na ovaj način dobija se i druga grupa ograničenja:

- 11) $x_1 \leq 16.810$
- 12) $x_2 \leq 24.276$
- 13) $x_3 \leq 18.227$
- 14) $x_4 \leq 13.662$

Pored ovih nejednačina dodaje se i uslov nenegativnosti promjenljivih:

- 15) $x_j \geq 0, j = 1, \dots, 4.$

Problem optimizacije sa dodatnim uslovima datim pomoću nejednakosti važan je u ekonomskoj i finansijskoj analizi zato što se većina uslova vezanih za budžetska ograničenja ili prirodna ograničenja na vrijednosti varijabli izražava upravo preko uslova nejednakosti (Urošević & Božović, 2013). Optimizacija programa proizvodnje vršice se na osnovu različitih kriterijuma optimalnosti, a to su:

1. Maksimizacija dobiti
2. Maksimizacija prihoda od prodaje i
3. Maksimizacija količine proizvoda.

² Podaci su dobijeni iz tehnološke dokumentacije preduzeća „X“.

Postoje još mnogi kriteriji optimalnosti koje u ovom primjeru nećemo koristiti. Ipak, vrijedno je pomenuti da u kriznim situacijama (ekonomskim, finansijskim, uslovi-
ma pandemije, kao što je to danas slučaj) često koristimo kriterij minimiziranja funkci-
je cilja. Neki autori smatraju da je osobina ekonomskih problema ta da se istovremeno
mogu posmatrati iz dva ugla.

Na primjer, kod proizvodnih problema ostvarenju maksimalnog fohotka uz data
ograničenja odgovara problem koji ima za cilj ostvarenje minimalnih troškova proiz-
vodnje (Andrijić, 2002). Toj činjenici ipak više odgovara postojanje dualnog modela
koji nije predmet naše analize.

Postojeći plan proizvodnje, dobit i realizaciju analiziraćemo pomoću metoda
linearnog programiranja. Rezultati analize pokazaće, između ostalog, da li je potrebno
primjeniti naučne metode tj metode optimizacije u cilju donošenja efikasnih upravl-
jačkih odluka.

Uprava preduzeća je planirala:

1. ostvariti dnevnu dobit u iznosu od 2.145 KM;
2. realizovati dnevnu proizvodnju u iznosu od 4.789 KM;
3. proizvesti dnevno 2.000 komada svih proizvoda zajedno.

Za postavljanje funkcije cilja potrebni su podaci o cijenama koštanja i prodaje
pojedinih proizvoda koji su dati u tabeli br.3.³

Tabela 3. Podaci o cijenama proizvoda

Realna varijabla	Cijena koštanja (KM)	Veleprodajna cijena (KM)	Profit (KM)
X1	0,85	2,01	1,16
X2	1,01	2,11	1,1
X3	0,80	1,65	0,85
X4	5,90	8,20	2,3

Izvor: Dopuna autora

Funkcija cilja:

$$(\max); z = 1,16 \ x_1 + 1,1 \ x_2 + 0,85 \ x_3 + 2,3 \ x_4 .$$

Formiranjem matematičkog modela stvoreni su uslovi za rješavanje ovog
problema metodom linearnog programiranja, pošto su promjenljive x_1, x_2, x_3 i
 x_4 međusobno linearno povezane, postoji sistem ograničenja koji limitira
proizvodni proces a rješavanjem modela postiže se cilj definisan izabranim
kriterijumom optimalnosti.

³ Podaci su dobijeni iz tehnološke dokumentacije preduzeću „X“.

Može se reći da teorija optimalnih sistema pokriva, bar u postavci, sve zadatke optimalnog upravljanja. To ne znači da ih i uspješno rješava. Šta više, praktično primjenjivi algoritmi razvijeni su i važe samo za vrlo uske klase zadataka upravljanja (Petrović, 1977).

Za rješavanje problema u ovom radu korišćemo računarski softver Quantitative Methods For Windows, razvijen od kompanije Pearson.

Rezultati optimizacije, dobijeni pomoću računarskog softvera⁴, predstavljeni su u kako slijedi.

Tabela 4. Rezultati optimizacije

	Maksimalna dobit	Maksimalna prodajna cijena	Maksimalna količina
Prvo rješenje:	$x_1 = 0$ $x_2 = 0$ $x_3 = 0$ $x_4 = 0$ $z = 0$	$x_1 = 0$ $x_2 = 0$ $x_3 = 0$ $x_4 = 0$ $z = 0$	$x_1 = 0$ $x_2 = 0$ $x_3 = 0$ $x_4 = 0$ $z = 0$
Drugo rješenje:	$x_1 = 0$ $x_2 = 0$ $x_3 = 0$ $x_4 = 733,95$ $z = 1.680,07$	$x_1 = 1.920$ $x_2 = 0$ $x_3 = 0$ $x_4 = 0$ $z = 1.920$	$x_1 = 0$ $x_2 = 0$ $x_3 = 0$ $x_4 = 733,94$ $z = 6.018,35$
Treće rješenje:	$x_1 = 1.775,76$ $x_2 = 0$ $x_3 = 0$ $x_4 = 721,18$ $z = 3.718,607$	$x_1 = 1.394,19$ $x_2 = 0$ $x_3 = 2.629,05$ $x_4 = 0$ $z = 4.023,24$	$x_1 = 0$ $x_2 = 1.973,39$ $x_3 = 0$ $x_4 = 719,66$ $z = 10.065,9$
Četvrto rješenje:	$x_1 = 1.385,62$ $x_2 = 0$ $x_3 = 2.258,76$ $x_4 = 413,15$ $z = 4.477,50$	$x_1 = 1.385,62$ $x_2 = 0$ $x_3 = 2.258,76$ $x_4 = 413,15$ $z = 4.057,53$	$x_1 = 0$ $x_2 = 1.556,55$ $x_3 = 2.171,60$ $x_4 = 423,91$ $z = 10.343,57$

⁴ Prilog 1-3.

Peto rješenje:	$x_1 = 0$	$x_1 = 0$
	$x_2 = 1.556,55$	$x_2 = 1.556,55$
	$x_3 = 2.171,60$	$x_3 = 2.171,60$
	$x_4 = 423,91$	$x_4 = 423,91$
	$z = 4.533,073$	$z = 4.152,07$

Izvor: Kalkulacija autora u sofveru QM

Analizirajmo jednu od najvažnijih ekonomskih veličina, dobit. Optimizacija dobiti, iz prethodne tabele, biće detaljnije objašnjena u nastavku teksta.

Prema optimalnom programu maksimizacije dobiti, preduzeće „X“ trebalo bi realizovati slijedeće dnevne količine pojedinih proizvoda:

$$x_1 \text{ (količina proizvoda A)} = 0,$$

$$x_2 \text{ (količina proizvoda B)} = 1.556,55 \text{ komada},$$

$$x_3 \text{ (količina proizvoda C)} = 2.171,60 \text{ komada},$$

$$x_4 \text{ (količina proizvoda D)} = 423,91 \text{ komada}.$$

Vrijednost funkcije cilja pri izvršenoj optimizaciji iznosi $z_0 = 4.544,073$ KM/dan, što pokazuje da u slučaju da se preduzeće „H“ opredijeli za realizaciju navednog optimalnog programa proizvodnje, biće u mogućnosti da ostvari najveću moguću dobit u pomenutom iznosu.

Vrijednost funkcije cilja se od početnog iznosa od 0 KM, u prvoj iteraciji, povećala na 1.680,07 KM, u drugoj iteraciji, 3.718,607 KM u trećoj iteraciji, 4.477,50 KM, u četvrtoj iteraciji, da bi najveći mogući iznos od 4.503,073 KM dostigla u petoj, optimalnoj iteraciji (planirana dnevna dobit iznosi 2.145 KM).

Tumačenje vrijednosti ostalih promjenljivih:

$x_5 = 31,51$; (izravnavaјуća varijabla iz prvog ograničenja) – prema optimalnom programu proizvodnje, ostaće neiskorišteno 31,51 h rada mašine 1;

$x_6 = 7,73$; (izravnavaјуća varijabla iz drugog ograničenja) – prema optimalnom programu proizvodnje, ostaće neiskorišteno 7,73 h rada mašine 2;

$x_7 = 778,33$; (izravnavaјуća varijabla iz trećeg ograničenja) – prema optimalnom programu proizvodnje, ostaće neiskorišteno 778,33 h rada mašine 3;

$x_8 = 0$; (izravnavaјуća varijabla iz četvrtog ograničenja) – prema optimalnom programu proizvodnje, mašina 4 biće maksimalno iskorištena;

$x_9 = 0$; (izravnavaјуća varijabla iz petog ograničenja) – prema optimalnom programu proizvodnje, mašina 5 biće maksimalno iskorištena;

$x_{10} = 17,48$; (izravnavaјуća varijabla iz šestog ograničenja) – prema optimalnom

programu proizvodnje, ostaće neiskorišteno 17,48 h rada mašine 6;

$x_{11} = 7,29$; (izravnavajuća varijabla iz sedmog ograničenja) – prihvatanjem optimalnog programa, neće biti iskorišteno 7,29 h rada mašine 7;

$x_{12} = 6,86$; (izravnavajuća varijabla iz osmog ograničenja) – prihvatanjem optimalnog programa, neće biti iskorišteno 6,86 h rada mašine 8;

$x_{13} = 0$; (izravnavajuća varijabla iz devetog ograničenja) – prema optimalnom programu proizvodnje, mašina 9 biće maksimalno iskorištena;

$x_{14} = 446,58$; (izravnavajuća varijabla iz desetog ograničenja) – prihvatanjem optimalnog programa, neće biti iskorišteno 446,58 h rada mašine 10;

$x_{15} = 16.810$; (izravnavajuća varijabla iz jedanaestog ograničenja) – prema optimalnom programu proizvodnje, ostaće nepodmireno tržište proizvodom A u cjelokupnoj količini od 16.810 komada jer se proizvod A ne proizvodi;

$x_{16} = 1.556,55$; (izravnavajuća varijabla iz dvanaestog ograničenja) – prema optimalnom programu proizvodnje, ostaće nepodmireno tržište proizvodom B u količini od 1.556,55 komada;

$x_{17} = 2.176$; (izravnavajuća varijabla iz trinaestog ograničenja) – prema optimalnom programu proizvodnje, ostaće nepodmireno tržište proizvodom V u količini od 2.171,6 komada;

$x_{18} = 423,91$; (izravnavajuća varijabla iz četrnaestog ograničenja) – prema optimalnom programu proizvodnje, ostaće nepodmireno tržište proizvodom G u količini od 423,91 komad.

ZAKLJUČAK

Prilikom matematičkog proučavanja hipotetički postavljenog problema formulisana je model koji je formalni odraz originalnosti, a sama metodologija modeliranja, u skladu sa postavljenim ciljem, izvedena je u sklopu razvoja teorije i primjene operacionih istraživanja. Implementacija modela u optimizaciji proizvodnog programa preduzeća „X“, pokazala je da je moguće ostvariti mnogostruko veću dnevnu dobit nego što je bila do sada. Planirana dnevna dobit bila je 2.145 KM, a prema optimalnom programu proizvodnje 4.533,07 KM; Planirana realizacija bila je 4.789 KM, a prema optimalnom programu proizvodnje 10.343,5 KM; Planirana proizvodnja svih proizvoda bila je 2.000 komada, a prema optimalnom programu proizvodnje 4.152 komada. Upravo ta činjenica dovoljno govori da se u okviru ekonomske analize moraju koristiti znanja i rezultati istraživanja do kojih se dolazi primjenom kvantitativnih modela. U sklopu postoptimalne analize vršena je kontrola tačnosti tako da se dobijeno rješenje odnosi na sve dimenzije početno postavljenog problema pa time rezultati modela kao njegova matematička replika, ostaju van polja kompromitacije. Dakle, pokrenuta procedura u okviru ekskluzivne podrške procesu odlučivanja kojom se u pokaznom primjeru tradicionalni pristup zamjenjuje modelovanjem u vidu matematičko logičkih odnosa, doprinosi pomijeranju granica tehnologije upravljanja od slučajnosti ka pro-

računljivosti. Sa aspekta korisničke prakse ostvareni prirast znanja evidentno podiže vitalnost i radni potencijal posmatranog sistema. Smanjuje entropiju tako da u isto vrijeme služi i kao najbolji oponent i korektiv tezi o naučnoj nesaznatljivosti efekata uspostavljenog, a potom narušavanog determinizma. Dijalog sa modelom svakako omogućava autorima bolje razumijevanje i komunikaciju sa problemom i stimulise kreativnost u pogledu poboljšanja kombinacija raspoloživih resursa. To doprinosi izboru i ocjeni onih opcija i alternativa koje u okviru datog istraživanja simboličnim opisom promjena na entitetu, dovode do ostvarivanja modelske projekcije. Reprezentativnost i podobnost modela kao virtuelnog alata takođe je potrebno testirati kroz univerzalnost primjene, što podrazumijeva stalnu manipulaciju sa entitetom. Time bi se potvrđivala validnost zasnovana na tezi permanentne kritičke upotrebe i težnji smanjenja negativnog znanja, a u funkciji prevazilaženja anarhičnosti upravljačke tranzicije.

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OPTIMIZATION ALGORITHM OF RESOURCE ALLOCATION IN ORDER TO EXAMINE THE ECONOMIC EFFECTS OF LINEAR PROGRAMMING MODEL RESPONSE

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Summary: *The concept of examining decisions using abstract research constructions as virtual aids enables the design of the management platform and the creation of the behavior of the future state of the system. Checking the effects of decisions in a real system through an appropriate mathematical-logical apparatus certainly affects the reduction of randomness and spontaneity of management. The symbolic connection of the input that produces the combined input action and the output that manifests the reaction expressed by the degree of sensitivity and enables the translation of the imaginary expression of reality into the operative mathematical language. The commitment to this type of model is based on the fact of almost standardized procedures in terms of choosing the priority of including certain forms of resources, which makes it representative in terms of achieving the goal function defined by the criterion of optimality. In this sense, we can talk about a whole range of optimization problems with mutually inconsistent tactical goals and thus the need for their refined balance, and one of such challenges is the focus of attention of a specific research project. The mathematical model represents a formalized description of the action of physical contents, and we use it to support the decision-making process when the complexity of reality allows that. Accordingly, to express the regularity of functioning, a deterministic model of linear programming in the form of a set of relations describing the input-output effect of influential factors used in this paper. With a tolerant simplification of reality, the perception of the model, based on the coincidence with the structure of the original, actually shows an approximation that means analogous behavior demonstrated on the quantitative model or its derivative - the optimization model. This thesis supports the fact that the corresponding relationship between the model and the original allows the examination of the behavior of the observed hypothetical system, and the analysis of the sensitivity map of the variable, in the form of a goal function, becomes a source of modeling information. Also, the system is not influenced by a high rate of change that would mean expanding from deterministic to stochastic modeling, but all methodological resources are mobilized so that the model concept would not become a theoretical misconception that would lead to quasi-decision making. The author's analytical thinking and logic try to give a chance to the imagination, which connects creativity and physical resources that indicates several alternatives, which contain future parameters. In this way, the authors use the model as an increment of knowledge to con-*

nect the a priori management reserve of their accuracy with the reality of hypothetical data within a rational approach.

Keywords: modeling; simplex method; resource allocation optimization; sensitivity analysis; QM Software.

JEL classification: C44.

PRIOLOG

Prilog 1. Kriterijum maksimalna dobit: optimalno rješenje

The screenshot shows the QM for Windows interface. The 'Linear Programming Results' window is open, displaying the Simplex method iterations. The optimal solution is reached at iteration 4, with a maximum objective value of 4000. The optimal solution is: $x_1 = 0, x_2 = 0, x_3 = 0, x_4 = 0, x_5 = 0, x_6 = 0, x_7 = 0, x_8 = 0, x_9 = 0, x_{10} = 0, x_{11} = 0, x_{12} = 0, x_{13} = 0$.

Izvor: Autori

Prilog 2. Kriterijum maksimalna prodajna cijena: optimalno rješenje

The screenshot shows the QM for Windows interface. The 'Linear Programming Results' window is open, displaying the Simplex method iterations. The optimal solution is reached at iteration 4, with a maximum objective value of 4000. The optimal solution is: $x_1 = 0, x_2 = 0, x_3 = 0, x_4 = 0, x_5 = 0, x_6 = 0, x_7 = 0, x_8 = 0, x_9 = 0, x_{10} = 0, x_{11} = 0, x_{12} = 0, x_{13} = 0$.

Izvor: Autori

Prilog 3. Kriterijum maksimalna količina: optimalno rješenje

The screenshot displays the QM for Windows software interface. The top menu bar includes File, Edit, View, Module, Fgprint, Tools, Window, and Help. Below the menu is a toolbar with various icons for file operations and solving. The main window is divided into two panes. The left pane, titled 'Objective', shows 'Maximize' and 'Minimize' options. The right pane, titled 'Instructions', contains the text: 'This is the optimal solution. Press finish to end the iteration or select a column to enter the basis.' Below this, the 'Linear Programming Results' section is visible, showing a table of results for 'Simplex iteration 6'. The table has columns for 'Basic Variable', 'Quantity', and 'X1' through 'X13'. The rows represent the iterations of the Simplex method, showing the values of the basic variables and the objective function at each step. The final row shows the optimal solution with the objective function value of 4152.000.

Basic Variable	Quantity	X1	X2	X3	X4	slack 1	slack 2	slack 3	slack 4	slack 5	slack 6	slack 7	slack 8	slack 9	slack 10	slack 11	slack 12	slack 13
0	slack 1	928.430	0	0	0	0	1	0	0	-0.016	-0.004	0	0	0	0	0	0	0
0	slack 2	962.2678	-0.005	0	0	0	0	1	0	0	-0.002	0	0	0	0	0	0	0
0	slack 3	181.5749	-0.005	0	0	0	0	1	-0.238	-0.094	0	0	0	0	0	0	0	0
0	X4	431.8142	0.076	0	0	0	0	0	1	1.7442	0.6077	0	0	0	0	0	0	0
1	0	22	1586.552	1.1234	0	0	0	0	0	-0.407	2.3297	0	0	0	0	0	0	0
0	slack 4	342.5245	-0.03	0	0	0	0	0	0	-0.0053	-0.114	0	0	0	0	0	0	0
0	slack 7	172.706	0.059	0	0	0	0	0	0	-0.0061	-0.017	0	1	0	0	0	0	0
0	slack 8	173.1367	0.059	0	0	0	0	0	0	-0.0053	-0.015	0	0	1	0	0	0	0
1	X3	217.1604	-0.029	0	0	1	0	0	0	-1.5612	-1.542	0	0	0	0	0	0	0
0	slack 10	12.4221	-0.01	0	0	0	0	0	0	-0.001	0.006	0	0	0	0	0	0	0
0	slack 11	16810	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	X2	221.9.45	-1.1234	0	0	0	0	0	0	0.007	-2.3297	0	0	0	0	0	0	0
0	slack 14	16055.4	0.0074	0	0	0	0	0	0	1.5612	1.542	0	0	0	0	0	0	0
0	slack 14	15328.09	-0.078	0	0	0	0	0	0	1.7442	-0.6077	0	0	0	0	0	0	0
0	X1	4152.000	0.002	0	0	0	0	0	0	-1.423	1.8462	0	0	0	0	0	0	0
0	CP2		-0.002	0	0	0	0	0	0	-1.423	-1.8462	0	0	0	0	0	0	0



Izvor: Autori



THE ROLE OF INCOME DISTRIBUTION IN THE GROWTH-POVERTY NEXUS: EVIDENCE FROM CESEE COUNTRIES, WITH PARTICULAR REFERENCE TO THE MACEDONIAN ECONOMY

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Abstract: *The paper explores the income distribution as a channel of transmission of the effects of economic growth on poverty reduction. For that purpose, we analyse data for the CESEE countries with a focus on the Macedonian economy. Since the 1990s, in the transition process to market economies, inequalities within countries in the CESEE region have risen the most. The income distribution achieved in the last decade is not sufficient to neutralise the high inequality created after 1990. The Macedonian economy shows improved income distribution in the last decade as well, which influences the level of poverty. Still, income inequality and the relative poverty rate are among the highest in the CESEE region. The study sheds light on the effects of the predistributive and redistributive factors on the level of inequality and poverty. We consider the extent to which different parts of the income distribution are affected by the process of average income growth. The main conclusion from the empirical analysis for the CESEE countries is that the sign of the growth rate of the average income of the population, in most cases, is an important predictor of the income growth rate of the quintile groups. Correlation results show that the sign of the growth rates of the average income of the population is the most important determinant for the sign of the growth rates of the average income of the quintile group for the quintiles nearest to the average income of the population.*

Keywords: growth; income; distribution; inequality; poverty.

JEL classification: I32, O40, O10, N10.

INTRODUCTION

The paper addresses the issue of the transformation of economic growth to poverty alleviation in the CESEE countries¹ with emphasis on the role of changes in the income distribution that it induces. As a direct consequence of this functional connection, changes in poverty over time, among others, is determined by the changes in these two factors. The average economic growth is not a reflection of how growth is distributed among households with different characteristics. We analyse the distributive characteristics of economic growth and determine whether the benefit of economic growth is distributed equally through the whole distribution, or the growth has an asymmetric influence on poverty. We will shed some light on the tax system, taking into consideration government transfers, as the most important instruments to correct inequality through income redistribution. In the analysis how the growth may have contributed to poverty reduction, it is important to understand the role of income distribution in the growth-poverty nexus. Higher economic growth can increase poverty when inequality is increased so much that the positive impacts from the growth are neutralised by the negative influences of the increased inequality. If inequality is increasing in parallel with GDP per capita, economic growth can lead to higher poverty (Stiglitz, 2016).

LITERATURE OVERVIEW

Recently disseminated case studies pointed out that the relationship of the income distributions and economic growth is at “once strong and complex”. The growth-poverty relation is not simple and the corresponding elasticity is not constant across countries. Dollar and Kraay (2001)) in their article “Growth is good for the poor” concluded that, generally, poor population has benefited from growth as much as everyone else, but that does not mean that growth is the single factor which can help the poor population to escape from poverty. The results of the used time-series data (Muklok, 2012) showed that economic growth is an important, but not a sufficient factor for poverty reduction. Certainly, despite economic growth, an appropriate interaction between growth and distribution is essential for poverty reduction (Bourguignon 2003). Lustig et al. (2002) argued that “in sum, economic growth is a crucial factor in poverty reduction, but the level of inequality affects its impact on poverty”.

Fosu (2011) presented evidence with findings that there is a significant discrepancy in the countries’ abilities to channelise economic growth to poverty reduction based on different inequality profiles. Poverty rate alleviation is a result not only of economic growth, as a key factor, but it is also a reflection of growth elasticity of poverty reduction concomitant with high inequality (Ferreira, 2010).

Other modern economists (Ravallion, 2005, Bourguignon, 2003, Adams, 2004) concluded that a higher level of inequality in society neutralises the extent of the ef-

¹ Countries from the region of Central, Eastern and Southeastern Europe. The CESEE countries have several common characteristics. First, CESEE countries are small and open economies with strong ties with EU economies. Second, part of the countries are already members of the EU, and part are candidates or potential candidates for EU membership. Third, the transition process to market economies in the 1990s is also a characteristic they have in common. For the purpose of the paper, the CESEE region is composed of the following countries: Poland, Czech Republic, Slovakia, Hungary, Estonia, Latvia, Lithuania, Romania, Slovenia, Bulgaria, Croatia, Serbia, Montenegro, North Macedonia and in some cases Albania.

fects of growth on the level of poverty. Inequality can be harmful to the poor, but if the inequality reduction policies lead to additional distortions in the economy, the results of those policies can have ambiguous effects on economic growth and reduction of poverty (Ravallion, *Inequality is Bad for the Poor*, 2005). Thorbecke (2013) in his cross-country analysis, indicates that low growth rates and high inequality have been the main barrier for decreasing poverty. Meier and Stiglitz (2001) discussed the inclusion policies that will influence employment opportunities and decreasing disparities in incomes which will influence in creating a higher quality of life for the people who belong in the groups with the lowest income.

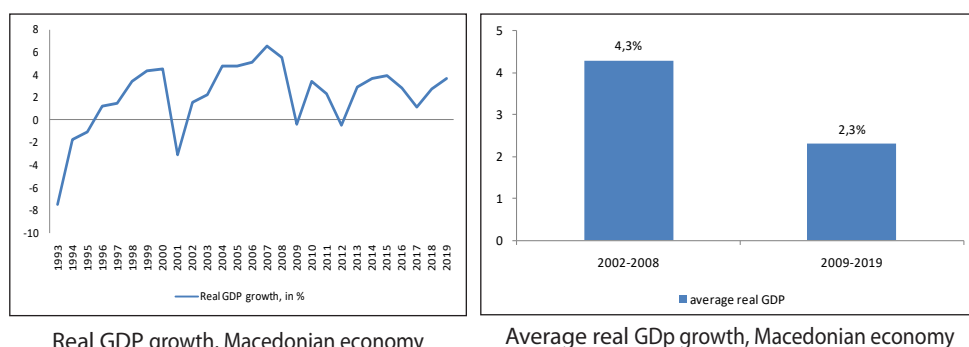
The pace of poverty reduction in a given country and at a given point of time will depend on the rate of average growth, the initial level of inequality and change in the distribution of income (Bourguignon F. , 2004) . This issue links the phenomena of economic growth, inequality and poverty in a so-called “triangle of poverty-growth-inequality”. The focus is on the link between growth of the average income on the one hand, and changes in poverty on the other hand. This relationship is mediated by the level of inequality in distribution at the beginning of the observed growth period and by the change in the level of inequality over the same period. Particularly, the fastest poverty reduction will be observed in countries with the highest average income growth and in countries where income growth is accompanied by decreasing inequality (Bourguignon F. , 2003). There are empirical findings that show that when initial inequality is higher than growth, *ceteris paribus*, it has less influence on reducing poverty, i.e. the absolute value of poverty elasticity in terms of average income is lower (Ravallion, 2005, Bourguignon, 2003, Ferreira, 2010). Many studies demonstrate that a high level of initial inequality is harmful to the inclusive growth of the economy and consequently for reduction of poverty, especially in countries with very high-income inequality (Deininger and Squire, 1998; Ravallion and Chen, 2001) Additionally, other studies show that countries with lower initial inequality seem to have better preconditions for higher growth. There consequently is a growth effect to lower inequality where the economies are faced with a triple effect of inequality reduction, i.e. it reduces poverty immediately, it increases the poverty elasticity of growth, and it appears to increase economic growth (Klasen, 2005). Despite the fact that various analyses suggest that different levels of inequality between countries have implications on growth, they do not necessarily imply (re)distribution effects, seen as changes in inequality within a country which will necessarily have growth effect. Some findings concluded that redistribution has a negative influence on growth in the short term (Klasen, 2005). Many years back, Kuznets (1955) through the inverted U-curve elaborated that with achieved economic growth, in the first phase, the degree of inequality would increase and, then, in the next phase, the inequality will decrease. Specifically, in the *primaeval* stage of development, income inequality will increase, until the critical point is reached when income distribution is more equitable and results in significant reduction in the poverty rate.

THE ROLE OF INCOME DISTRIBUTION ON THE POVERTY OBSERVED THROUGH THE (P)REDISTRIBUTION MEASURES

In the first years after the country's independence in 1991, the Macedonian economy was unable to achieve stable economic growth. The reason for the deep slump of GDP was the negative effects of the process of social transition and ownership

transformation as well as losses of the former markets. This period was followed by a gradual recovery of the economy, leading to a period in 2000 when a high level of economic growth was achieved (4.5 per cent). Already the next year, the growth melted down (-3.1%) as a consequence of the inter-ethnic tensions in the country. The average economic growth of 4.3 per cent in the period 2002-2008, years without domestic or external shocks, is significantly higher in comparison with the period 2009-2019 when the economy was under the influence of two external shocks in 2009 and 2012 and prolonged political uncertainty in 2017. In the period from 1993 to 2019, the economy grows at an average annual rate of 2.1 per cent.

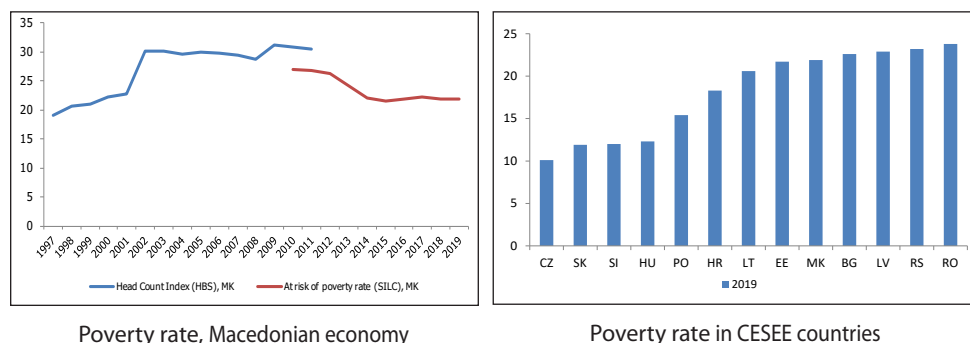
Chart 1. Real GDP growth



Source: National Bank of the Republic of North Macedonia

The Macedonian economy is faced with a high level of poverty. Estimated relative poverty rates in the Macedonian economy are among the highest in the region of Central, Eastern and Southeastern Europe (CESEE region) over a long time period. In 2019, a higher at-risk-of-poverty rate was registered only in Serbia and three EU countries – Bulgaria, Romania and Latvia.

Chart 2. Poverty indicators

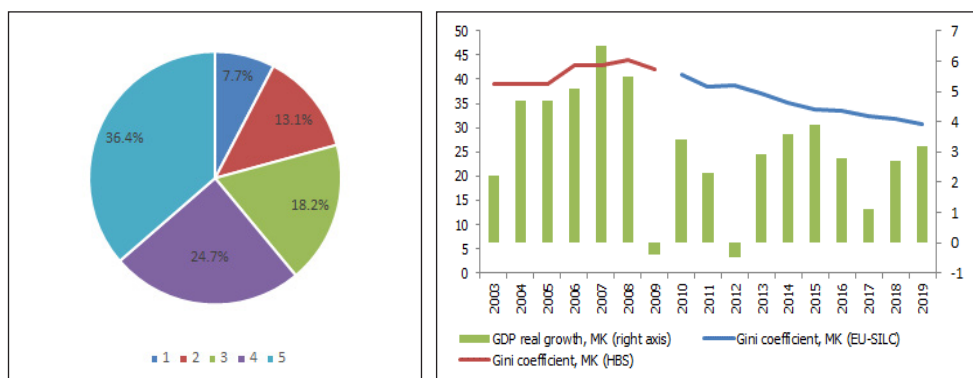


Source: State Statistical Office of the Republic of North Macedonia, Eurostat

Income inequality is driven by different economic factors such as the level of unemployment, inactivity and informal employment, different (re)distributive factors, etc. Of the total national equivalised income in the Macedonian economy (2019), 61 per cent is concentrated in the fourth and fifth quintiles (25 per cent and 36 per cent, respectively). In contrast to these figures, 21 per cent of the national equivalised income is concentrated in the bottom 40 per cent of the population (8 per cent and 13 per cent, respectively). Despite the relatively positive income distribution in the last years, the share of people having income greater than 150 per cent of the median income is still high. In 2018, 21 per cent of the population had income greater than 150 per cent of the median income. Around 28 per cent of the national income is held by 10 per cent of the population. (World Inequality Database, 2000). At the same time, 6 per cent of the pre-tax national income is held by 1 per cent of the population.

The highest level of income inequality in the Macedonian economy, observed through the Gini coefficient, was registered in 2008, at 44 per cent², and after reaching the critical point in 2008, the Gini coefficient is continuously decreasing, achieving more equitable income distribution in parallel with income per capita increasing. In the period from 2003 to 2009, economic growth led to a rise in inequality after a long-term reduction in inequality was registered. In parallel with more equitable income distribution (analysed by the Gini coefficient), a decline in the poverty rate was registered. These descriptive statistics substantiate the validity of the Kuznets hypothesis in the Macedonian economy.

Chart 3. Equivalised disposable income by quintiles and Gini coefficient



Share of equivalised disposable income by quintiles, Macedonian economy, 2019

Gini coefficient of equivalised disposable income, Macedonian economy

Source: State Statistical Office of the Republic of North Macedonia

² In that period, the Gini coefficient was estimated through the Household Budget Survey, while the EU-SILC survey was introduced in 2010. It should be noted that HBS and EU-SILC data are not fully comparable. HBS is a consumption-based survey, while EU-SILC is income-based survey. Income sources are better captured in EU-SILC. However, the data from both sources can be used to follow the trend.

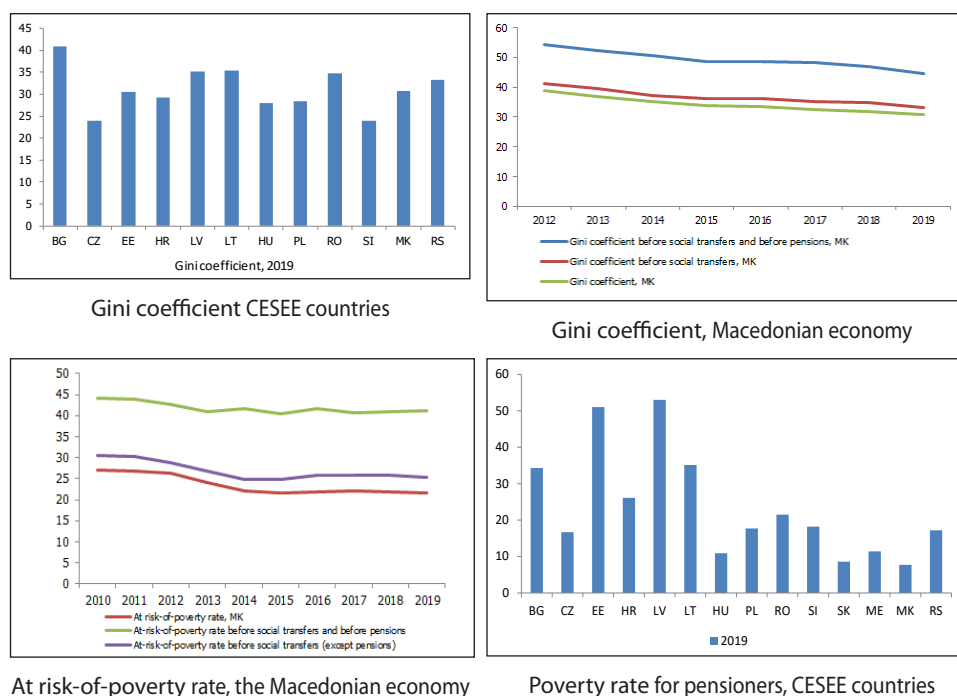
Despite the decrease registered in the last years, the level of inequality is still high. A comparison of the Gini coefficient for the Macedonian economy with other countries from the CESEE region shows more equal results than the comparison of poverty. However, with a Gini coefficient of 30.7 per cent in 2019, the Macedonian economy accomplishes more equal income distribution than six CESEE countries: Bulgaria, Latvia, Lithuania, Romania, Serbia and Montenegro.

For reducing high-income inequality, and thus poverty, countries implemented the policy of adequate social benefits. In the Macedonian economy, social transfers influenced a more appropriate income distribution, decreasing the level of poverty at the bottom of the distribution. Despite the low share of social transfers in the total disposable household income (by 3.9 per cent), transfers are an important source of income at the bottom of the distribution, with a share of 15.8 per cent in the first quintile group and 6.9 per cent in the second quintile group (2019). They reduced income inequality on average by 2.5 pp (from 2012 to 2019). The impact of social transfers on the at-risk-of-poverty rate is slightly stronger, decreasing the poverty rate on average by 3.3 pp (from 2010 to 2019). Social transfers are complementary income of the households at the bottom of the distribution. As a measure with a distributive effect, social transfers are an efficient measure for reducing poverty. The high efficiency of this distributive channel, among others, is due to the low level of income at the bottom of the distribution.

Another available policy instrument for direct transfer of funds to households is through elderly persons. Transfers in the form of pensions are an efficient instrument influencing not only on pensioners, but on the total poverty level. Pensions are the second most important source of income participating with 20.8 per cent in total average household income (2019) and the same can be observed as a replacement income. Characteristic of pensions is the fact that they are an important source of income for all quintile groups. Pensions contributed significantly to income growth among all quintiles of the distribution. Besides the bottom 40 per cent of the distributions, pensions represent a significant share of household income even for the highest, fifth quintile group. Pensions influenced negatively on income inequality, decreasing the Gini coefficient on average by 12.6 pp (in the period from 2012 to 2019). The negative impact of pensions on the total at-risk-of-poverty rate is significant, decreasing the poverty rate on average by 14.9 pp in the analysed period (in the period from 2010 to 2019). The at-risk-of-poverty rate for retired persons is continuously decreasing on a yearly basis, reaching 7.7 per cent in 2019. Comparative analysis showed that Macedonia has one of the highest poverty rates among countries in the CESEE region. Contrary to this indicator, estimated at 7.9 per cent, the at-risk-of-poverty rate for retired persons (18 years and over) is at the lowest level in the CESEE region. This comparison confirms the importance of pension payments for the well-being of the elderly on average.

To reduce inequality, it is expected from the countries to promote inclusive growth with income focused on the bottom of the distribution. Specifically, the analysed descriptive statistics on the Macedonian economy show that in the last decade income growth was higher at the bottom of the distribution than the average income growth (according to the EU-SILC survey).

Chart 4. Inequality indicators and the impact of social transfers and pensions on inequality and poverty



Source: State Statistical Office of the Republic of North Macedonia Eurostat

Data on the Macedonian economy suggest that during the 1980s, when the country was part of Yugoslavia, the income growth of the bottom 40 per cent was slightly lower than the average income growth (-0.8 per cent). After the declaration of independence, this indicator has significantly deteriorated, i.e. the income growth of the bottom 40 per cent of the population was 27 per cent lower than the average income growth. This is one of the indicators showing that, in that period, the inequality in the Macedonian economy was increased. In the period from 2000 to 2007, the income growth of the bottom 40 per cent was slightly higher than the average income growth. In the last decade, income growth of the bottom 40 per cent was 14 per cent higher than the average income growth, which resulted in lower inequality in that period. We already analysed that the income growth at the bottom of the distribution is higher than the average income growth according to the EU-SILC data. Taking into consideration the whole period from 1980 to 2017, the difference between the bottom 40 per cent income growth and the average income growth is negative. Similar results to the Macedonian economy are also observed in other countries from the CESEE region (Bulgaria, Romania, Hungary, Czech Republic, Estonia). All countries had worse distribution at the bottom in the period from 1990 to 2000 and better distribution in the last decade, when the income growth of the bottom of the distribution was higher than the average income growth.

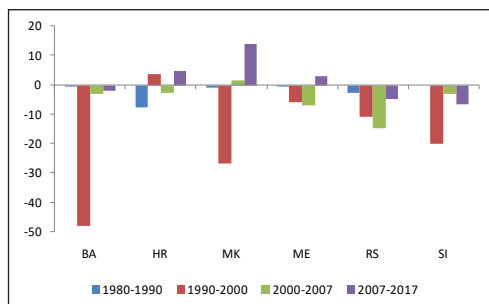
Following this indicator, we do not follow potentially rising inequality at the top of the distribution. Because of this reason, we will analyse the indicator for the differ-

ence between the bottom 50 per cent income growth and the top 10 per cent income growth. According to this indicator, the Macedonian economy showed a positive result in the period from 1980 to 1990 and in the period from 2007 to 2017, i.e. in these two decades, the income growth pace of the bottom 50 per cent was larger in comparison with the top 10 per cent income growth. The highest inequality in the country was created in the period from 1990 to 2000, a period when the process of privatisation of state-owned capital was accompanied with political instability because of the conflict in the neighbouring countries and the economic embargo from Greece. In this period, the income growth of the bottom 50 per cent of the population was lower by 36 per cent than the income growth of the top 10 per cent of the population. For the whole period of the last four decades, the income growth of the bottom 50 per cent of the adults was lower by 35 per cent in comparison with the top 10 per cent of the adults. A negative result is registered in the other countries from the CESEE region, as well. During the 1990s, inequalities within the countries in the CESEE region have risen the most. The countries in the region faced with structural economic changes and political instability. The index generally became positive for some countries during the last decade (Montenegro, Croatia, Romania, Hungary, Estonia, etc). The reason for this can be the fact that the authorities put this issue high on the agenda and started to create more effective public policies to reduce the inequality, but also the membership in the European Union, higher flexibility of the labour force within the Union and the working remittances. Despite the better distribution in the last decade, the growth rate is not enough to neutralise the high inequality in the countries created after 1990.

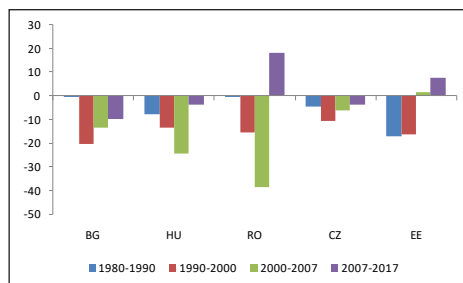
In this part, we will focus on the extent to which income inequality, analysed through the top 10 per cent income share, and poverty are linked. In that respect, the mechanical relationship between the top 10 per cent income share and the level of poverty rate is not inherent for the theoretical explanation. Theoretically, taking into consideration the methodology for relative poverty, an income increase of the top 10 per cent of the population does not directly affect the at-risk-of-poverty rate since the income is accumulated to the median equivalised income as well.

Comparing the data for the top 10 per cent income shares and at-risk-of-poverty rates in selected countries generally suggests a weakly positive relationship between these two indicators in most of the countries. A decrease in inequality in the Macedonian economy is accompanied by poverty reduction. A similar trend is seen in the Croatian economy. Specifically, when the top 10 per cent income share increased in 2015, poverty grew as well. This trend is also similar in Hungary and Romania. In Hungary, in the years when the top 10 per cent income share increased (2006, 2007), the at-risk-of-poverty rate rose as well. In Romania, the top 10 per cent income share went up in the period from 2012 to 2015, and in the same period the poverty rate increased.

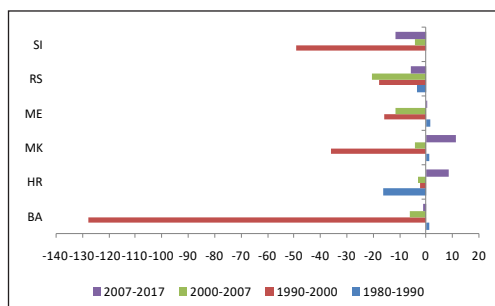
Chart 5. Income growth at the bottom of the distribution



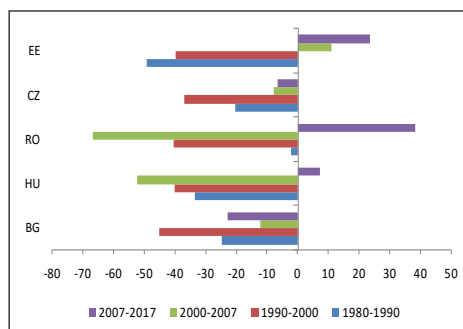
Differences between the bottom 40% growth and average growth in selected countries



Differences between the bottom 40% growth and average growth in selected countries



Differences between the bottom 50% growth and top 10% growth in selected countries



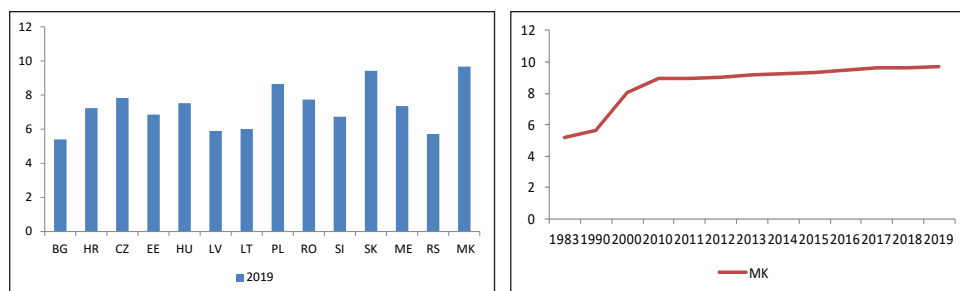
Differences between the bottom 50% growth and top 10% growth in selected countries

Source: World Inequality Database

An important aspect of the analysis is the post-tax income inequality in order to discover whether income inequality is a result of the pre-tax inequality or the differences in government redistribution (post-tax inequality). Taxes and government transfers are redistributed income if they reduce inequality, regardless of the degree to which this is accomplished over implicit or actual transfers from the top to the bottom of the distribution. Generally, there is a presumption in the theory that tax-transfer systems reduce inequalities by relocating resources to the population in low-income groups. With this instruments, countries have an effect on the level of income in the different quintiles, especially at the top of the distribution, and indirectly on the level of poverty. Nonetheless, tax policy can influence inequality without government transfers occurring (an example for that are progressive taxes which reduce inequality by itself even if revenues are not used for transfers). To analyse the influence of taxes on inequality, we will take into consideration the differences between the Gini coefficients, observed as

pre-tax national income³ and post-tax national income⁴ in selected countries. Net redistributive effects had an effect on decreasing inequality in the Macedonian economy by 9.7 p.p. (2019). Taxes and all transfers in the Macedonian economy are more redistributive than in other CESEE countries. Given the higher level of pre-tax inequality, the Macedonian economy remains more equal than the some other countries in the region, after all taxes and transfers are taken into account. The net effect of redistribution has been continuously increasing annually in the last decade (an exception is 2010 when we estimated an annual decrease). Aware of this, we conclude that the Macedonian economy is more equal than the economies of the other countries in the region as a result of the redistribution rather than predistribution measures. Of the countries in the CESEE region, only Slovenia has a similar net effect of redistribution. Bulgaria and Latvia are countries with the lowest effect of taxes and transfers in the last years. Since 1980, covering the period before and after introducing the market economy in the CESEE countries, all the countries achieved a better net effect of redistribution in the last years, except Estonia, Serbia and Slovakia. We should note that Slovenia and Estonia have achieved the biggest redistribution effect in 1980s, 1990s and 2000s, and despite the decrease in the last years, the net redistribution effect is still significant in comparison with the other CESEE countries.

Chart 6. Net redistributive effects, Macedonian economy and CESEE countries



Source: Author's calculation based on data published by the World Inequality Database

Characteristic for the Macedonian economy is the flat tax system, introduced in 2007, with a low tax rate of 12 per cent, reduced to 10 per cent in 2008 (refers to personal income tax rate and corporate income tax rate). Progressive taxation was adopted in 2019, still, in the same year, application of progressive tax rates was put on hold for the 36 months. Albania introduced a flat tax rate of 10 per cent in 2008. However, in 2014 Albania introduced two tax rates of 13 per cent and 23 per cent. Montenegro also introduced a flat tax rate of 9 per cent in 2007 (corporate income tax rate and personal income tax rate to be reduced to 9 per cent in 2010), but the tax system was changed in

³ Pre-tax national income is the sum of all personal income flows, before taking into account the operation of the tax and transfer system, but after taking into account the operation of the pension system. (Blanchet, Chancel, & Gethin, 2019)

⁴ Post-tax national income is equal to pre-tax income after subtracting all taxes and adding all forms of government transfers. (Blanchet, Chancel, & Gethin, 2019)

2013. Despite the flat tax system in the Macedonian economy, in 2018, the influence of taxes and government transfers on decreasing inequality was higher in comparison with Albania and Montenegro. Analyses of the countries from the CESEE region show that taxes and transfers in all other economies in the region have a lower effect on inequality than the effects in the Macedonian economy. The flat tax system introduced in 2007 did not have a substantially different effect on the level of post-tax inequality compared to the previous period (taking into consideration all forms of government transfers). In fact, the net effect of redistribution is slightly higher after introducing the flat tax system. In the period after introducing the flat tax system (twelve-year period, from 2007 to 2018), the net effect of redistribution is 9.1 p.p., while in the period before the changes of the tax policies (the twelve-year period from 1995 to 2006) the differences before pre-tax national income and post-tax national income is 8.31 p.p. The observation that net saving of the government is the highest in the CESEE region, and at the same time the impact of social transfers and pensions on poverty is significant, but still with the lowest influence in the region, leads to the conclusion that there is space for reduction of the informal economy (which will result with a higher collection of taxes), and/or that the government expenditures, other than social transfers and pensions, are also significant. Public policies could be predominantly focused on predistribution measures.

RESULTS FROM THE EMPIRICAL ANALYSIS

The presented conceptual frame is customised to the concept of “income quintile”, i.e. the level of income in the quintile group. The whole income distribution of the population, y , is divided into K quintile groups marked with the index $k \in \{1, 2, \dots, K\}$. Furthermore, the total number of households or, more precisely, the total mass of households, is equal to one. For the quintile group k , the average quintile income can be presented with the equation:

$$\varphi_{k,K}(y) = K \int_{(k-1)/K}^{k/K} y(q) dq \quad (1)$$

where q denotes quintile distribution of the income, $q \in [0,1]$. The share of the total income of the income group k in the total income of the whole population is:

$$\pi_{k,K}(y) = \frac{\int_{(k-1)/K}^{k/K} y(q) dq}{\int_0^1 y(q) dq} \quad (2)$$

Correspondingly, the average income of the income group k can be presented:

$$\varphi_{k,K}(y) = K * \pi_{k,K}(y) * \mu(y) \quad (3)$$

Where $\mu(y) = \int_0^1 y(q) dq$ is the average income of the population. Expression (3) shows that the differences in the average income of the quintile group k between the two distributions arise as a result of the differences in the share of the specific quintile group in the total income of the population and the differences in the average income at the level of the whole population.

By logarithmising both sides of the equation (3.3), we obtained:

$$\ln \varphi_{k,K}(y) = d \ln \pi_{k,K}(y) + d \ln \mu(y) \quad (4)$$

Taking into account that K is constant:

$$D \ln \varphi_{k,K}(y) = d \ln \pi_{k,K}(y) + d \ln \mu(y) \quad (5)$$

i.e.

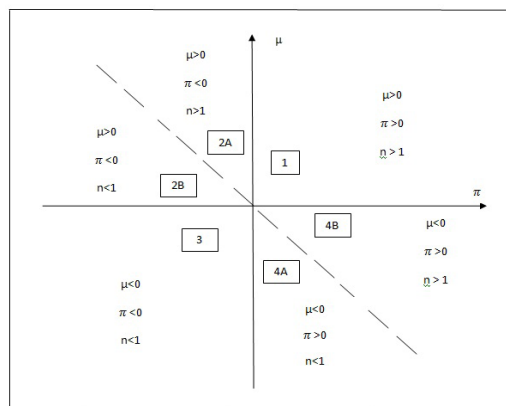
$$n_{k,K} = \frac{d \ln \varphi_{k,K}(y)}{d \ln \mu(y)} = \frac{d \ln \pi_{k,K}(y)}{d \ln \mu(y)} + 1 \quad (6)$$

The expression on the left side of the equation, $n_{k,K}$, is the average income elasticity of the quintile group k , taking into account the average income of the population, since it is measured as percentage change of the average income of the quintile group k which occurs in parallel with the growth of the average income of 1 per cent. It should be noted that we analyse the total, not partial elasticity: elasticity is total because economic growth affects the average growth of the quintile group, directly and indirectly, through the influence on the share of the observed quintile group in the aggregate income. In other words, we assumed that the growth of the average income of the population changes the share of the quintile group in the aggregate income. The right side of the equation (3.5) shows the elasticity of the share of the total income of the quintile group k in the total income of the population, considering the average share of the population. The equation clearly shows that in the case when the share of the observed quintile group does not depend on the average income (therefore, if $\frac{d \ln \pi_{k,K}(y)}{d \ln \mu(y)} = 0$), the average income of the same quintile group grows by the same rates as the average income of the population. In other words, if the economic growth, observed through the growth of the average income of the population, does not affect the share of the specific quintile group in the aggregate income of the population, in relative terms, income in the quintile group, on average, will grow equally as the entire population. If there is a relationship between the share of the quintile group in the aggregate income and the average income (if $\frac{d \ln \pi_{k,K}(y)}{d \ln \mu(y)} \neq 0$), growth of the average income of the population will not transform “one for one” in the growth of the average income of the quintile group. When positive economic growth is followed by a distributive change which increases the share of the quintile group in the aggregate income ($\frac{d \ln \pi_{k,K}(y)}{d \ln \mu(y)} > 0$), the average income of the quintile group will grow with higher rates in comparison with the average income of the population. Conversely, if the influence of the positive growth on the share of the quintile group in the aggregate

income is negative ($\frac{d \ln \pi k K(y)}{d \ln \mu(y)} < 0$), the average income of the quintile group will grow with lower rates than the average income of the population. That way, distribution changes which follow the growth depending on whether they are to the benefit or detriment of the observed quintile group can strengthen or weaken the influence of the population average on the average of the quintile group. Dependence of the dynamics of the average income of a quintile group k on the dynamics of the share of the quintile group in the total income of the population and the dynamics of the average income of the population can be presented graphically (Figure 1). The horizontal axis shows the growth rate of the share of the quintile group in the aggregate income, and the vertical axis shows the growth rate of the population. A line that runs diagonally through the second and the fourth quadrant is the locus of the differential equation (4.6) $d \ln \pi k K(Y) + d \ln \mu(y) = 0$, representing a combination of the growth rate $d \ln \pi k K(Y)$ and $d \ln \mu(y)$ for which the average income of the quintile group remains unchanged, $d \ln \phi_{k,K}(y) = 0$. For all combinations on the right side of the locus, the growth rate of the average income of the quintile group is positive: in the first quadrant μ and π are growing, consequently, ϕ is growing as well. In the areas 2A and 4B, μ and π are moving in the opposite directions; still, the growth of the first factor is more intensive than the decline of the second factor, which results in growth of the average income of the quintile group. At the same time, for all combinations on the left side of the locus, the average income of the quintile group is declining: in the third quadrant, μ and π are decreasing, and ϕ is decreasing as well. In the areas 2B and 4A, the changes of μ and π are with opposite sign, provided that the indicator which is declining, declines more intensively than the indicator which is growing.

In figure 1, it is graphically presented and described how the changes in the average income of the quintile group depend on the changes in the share of the specific quintile group in the aggregate income and changes in the average income of the population. In the same coordinate system, it can be shown for which combination the elasticity of the average income of the quintile group, given the average income of the population, is positive (growth/fall of the average income of the population increase/decrease the average income of the quintile group), and for which it is negative (growth/fall of the average income of the population decrease/increase the average income of the quintile group.). Both cases can be analysed when the average income of the quintile group is inelastic ($n_{k,K} < 1$), when it is unit elastic ($\ln_{k,K} l = 1$) and when it is elastic ($n_{k,K} l > 1$), taking into consideration the average income of the population.

Figure 1. Dependence of the dynamics of the average income of a quintile group on the dynamics of the share of the quintile group in the total income and dynamics of the average income of the population



Source: Author's illustration

When the economic growth is positive ($d \ln \mu > 0$), i.e. in the first and the second quadrants, for the observed quintile groups, the most appropriate combination is in the first quadrant: the elasticity here is higher than 1, which means that the average income of the quintile group grows with higher rates than the growth rates of the average income of the population as a result of the positive influence of the growth, enhanced with positive distributive changes for the quintile group (increasing the share of the quintile group in the aggregate income). Moving anticlockwise, we come to the combination for which elasticity is equal to 1 (unit elasticity), all combinations in the positive part on the vertical axis. For that combination, the average income of the quintile group grows with the same rates as the population average because there are no distributional changes which will affect the observed quintile group ($d \ln \pi = 0$). For a given positive growth rate of the population average to be at the point where elasticity is unit, it is worse than being at a point where elasticity is higher than one. We come to the combination where elasticity is between one and zero, when average income grows with positive rates, but lower than the growth rates of the average income of the population, as a result of the lower share of the quintile group in the aggregate income, which partially nullifies the favourable influence of the positive growth rates of the average income of the population. Furthermore, even worse is the combination when the elasticity is equal to zero, on the diagonal bisecting the second quadrant, where the average income of the quintile group does not change when the average income of the population is growing, and the positive influence of the growth of average income is completely neutralised by distribution changes which do not have a positive effect on the share of the quintile group in the aggregate income. After this, we come to the combination for which elasticity is negative, where distribution changes for the quintile group are so negative that the positive influence of the population average is more than neutralised and the average income of the quintile group declines as a result: with the rates which are according to absolute terms lower than the growth rates of the population average, in the points where elasticity is lower than 0 and higher than -1; with rates which are equal to the absolute values as growth rates of the population average

in the points where elasticity is equal to -1; with growth rates which are according to absolute values higher than the growth rates of the population average in the points for which elasticity is lower than -1. With the same arguments, we can explain that when there is negative economic growth, the situation is the opposite. For the given negative growth rate of the average income of the population, from the perspective of the observed quintile group, the worst combination is in the third quadrant, where elasticity is higher than 1, and the best combination is the space bounded by the positive part of the horizontal axis and the part of the slope line $-1/2$ which passes through the fourth quadrant, for which elasticity is lower than -1.

Chart 7 shows an empirical combination of the growth rates of the share of the quintile group in the aggregate income and the growth rates of the average income of the population for the whole sample (125 periods for the CESEE countries⁵). We use data on mean equivalised net income and quintile income (top cut-off point⁶), expressed in purchasing power standard to eliminate the differences in price levels between countries.

For the four quintile groups (from the first to fourth quintile), the most combinations are located in the space above the slope diagonal -1 which passes through the first and fourth quadrants (from 48 per cent to 64 per cent, depending of the quintile group). In other words, with positive growth, significant parts of the periods are those for which the income of the quintile groups grows at a faster pace in comparison with the mean equivalised net income. Depending on the quintile group, those are from 47 per cent to 61 per cent of the total number of periods. Of those 47-61 per cent, the biggest part (36 - 53 pp) are periods when the mean income of the population grows, and a small part (11-14 pp) when the income falls.

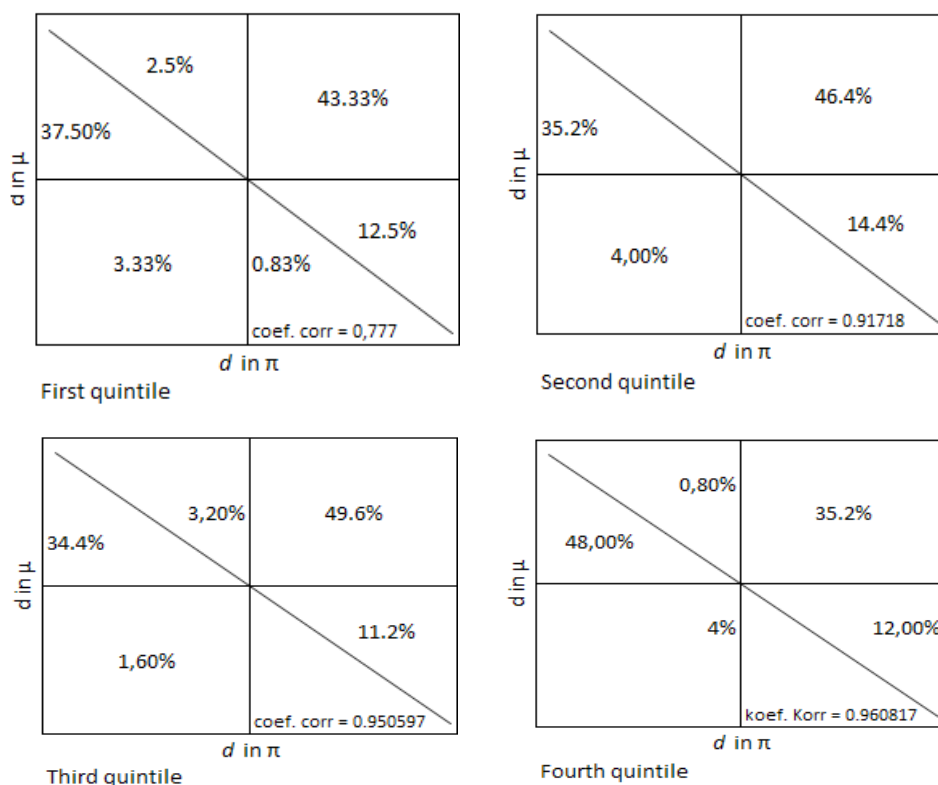
Negative growth is registered at around half of the total number of periods (between 36 per cent and 52 per cent). When negative growth is registered, the mean income of the population grows at a faster pace in comparison with the growth of the quintile group in around half of the cases (between 34 per cent and 48 per cent). When mean income decreases, quintile income drops by 1.6 per cent to 4 per cent, depending on the quintile group.

From these facts, we can conclude that the sign of the growth rate of the average income of the population in most cases is an important predictor of the growth rate of the income of the quintile group.

⁵ CESEE countries are covered, for the period 2011-2019.

⁶ Available indicator from Eurostat.

Chart 7. Income elasticity for the group of CESEE countries, by quintile and coefficient of correlation



Source: Author's estimations

The correlation is strong for all quintile groups; however, as values of the coefficient of correlation are shown, it varies by quintiles: it is the weakest for the first quintile group (coefficient of correlation = 0.777) and the strongest for the fourth quintile group (coefficient of correlation = 0.9608). There are few periods for which the sign of the quintile growth rates is opposite from the sign of population growth rates. Generally, the sign of the growth rates of the average income of the population is an important determinant for the sign of the growth rates of the average income of the income group. That is the most pronounced in the third and fourth quintile groups, which is expected result since in these groups the income is the closest to the average income of the population.

CONCLUSION

From the beginning of the transition to a market economy, the Macedonian economy achieved moderate economic growth, with frequent cycles, accompanied by a high level of inequality and poverty. During the 1980s, the income growth of the bottom 40 per cent was slightly lower than the average income growth (-0.8 per cent). Af-

ter the country declared independence, this indicator has significantly deteriorated (-27 per cent). In the period from 2000 to 2007, the income growth of the bottom 40 per cent was slightly higher than the average income growth. In the last decade, income growth of the bottom 40 per cent was 14 per cent higher than the average income growth. The analysed descriptive statistics substantiate the validity of the Kuznets hypothesis in the Macedonian economy. Despite the relatively positive income distribution in the last years, the income disparity is still high. The analysis for the CESEE countries shows similar trends. All CESEE countries perform worse distribution on the bottom in the period from 1990 to 2000 and better distribution in the last decade. Nevertheless, the results achieved in the last decade are not sufficient to neutralise the high inequality in the countries created after 1990. The better income distribution in the CESEE countries is a result of the more effective public policies followed by the positive effects of EU membership and higher flexibility of the labour force. The flat tax system introduced in the Macedonian economy in 2007 did not have a significantly different effect on the level of post-tax inequality in comparison with the previous period. Macedonian economy achieves more equal income distribution as a result of the net effects of redistribution, taxes and all transfers are more redistributive than in other CESEE countries which leads to the conclusion that the public policies could be predominantly focused on predistribution measures. When positive growth is registered (between 48 per cent and 64 per cent, depending from the quintile group), for significant parts of the periods the income of the quintile groups grows at a faster pace in comparison with the mean equivalised net income. Conversely, with negative growth (in 36 per cent to 52 per cent of the periods), the mean income of the population grows at a faster pace. Correlation results show that in the third and fourth quintile groups the sign of the growth rates of the average income of the population is the most important determinant for the sign of the growth rates of the average income of the income group.

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THE INFLUENCE OF THE ORGANIZATIONAL PROCESSES ON JOB SATISFACTION

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Abstract: *The concept of job satisfaction, which is most often defined as a satisfactory or positive emotional state that arises as a result of evaluating work or work experience, is one of the most important and most researched employee work-related issues. The relevance of the observed concept is the result of the belief that any changes in the level of job satisfaction have numerous positive, but also negative consequences, both for the individual and for the organization. In addition to the demographic or personal characteristics of employees, the cause of changes in the level of job satisfaction may be related to the organizational elements through which the work environment is shaped. As the demographic characteristics of employees cannot be greatly influenced, the attention of researchers is usually focused on a group of organizational factors or characteristics. Precisely for that reason, the research problem presented in this paper is the influence of the process in the organization on job satisfaction in various organizations operating in the Republic of Srpska. The main goal of this paper is to investigate and determine the existence and nature of the relationship between defined process factors in the organization as independent variables and their impact on job satisfaction as dependent variables. In order to investigate the observed impact and prove the set hypotheses, an empirical research was conducted, using a custom-made survey questionnaire, on a sample of 738 workers employed in 283 organizations from the Republic of Srpska. Reliability analysis, expressed by the Cronbach's alpha coefficient, shows a very high reliability of the developed instrument for testing satisfaction with organizational design. Testing of the set hypothesis was performed using correlation analysis, and the obtained results confirmed the hypothesis which claims that the processes in the organization affect job satisfaction.*

Keywords: *job satisfaction; processes; organizational design; human resource management.*

JEL classification: *J24, J28, L22, M21.*

INTRODUCTION

In modern business operations environment, with the increasing dynamism and complexity of the external and internal environment, organizations are forced to turn to creating added value through human capital. Thus, human resources have become a significant potential source of competitiveness and business success, and human resource management is becoming increasingly important in modern organizations. In addition to the employee competencies, job satisfaction plays a very important role. Job satisfaction is a satisfactory or positive emotional state that arises as a result of evaluating a job or work experience (Locke, 1969).

Organization and management of human resources theory deals with, among other things, the connection between the processes in the organization and job satisfaction. Thus, the processes in the organization have been identified as one of the causes of job satisfaction and *the research question* has been established: Do the processes in the organization, and in what way, affect job satisfaction?

Although at first glance it seems that the answer to this question is simple, there is no scientific knowledge, i.e., scientific confirmation of whether the processes in the organization have an impact on job satisfaction. Such research will be a pioneering attempt to understand the nature and intensity of the relations between the observed variables. For the above-mentioned reasons, *the subject of research* is within the business management scientific field and more specifically - organization and management scientific field. Empirical research was conducted in organizations operating in the Republic of Srpska.

The main goal of the research is to investigate and determine the existence and nature of the influence of organizational processes on job satisfaction. To this end, *scientific goals* have been set: to describe the impact of the organizational processes on job satisfaction; to classify process-related factors; to establish new scientific facts and insights into the impact of the processes in the organization on job satisfaction; to explain the cause-and-effect codependence and to provide information for the organization and personnel management. *Pragmatic goals* refer to the benefits that employees, managers and business owners will have. The work *hypothesis* is: Processes, as an element of organizational design, affect job satisfaction.

THEORETICAL ASPECTS OF RESEARCH

Job satisfaction

The concept of job satisfaction developed from organizational theory. This concept represents one of the most important and most researched attitudes that employees have regarding work (George & Jones, 2012; McPhail, Patiar, Herington, Creed, & Davidson, 2015). Due to the great interest many authors have in researching and studying the observed concept, it can be said that job satisfaction has become a central research problem (Goswami & Dsilva, 2019), one of the most frequently researched variables and one of the most popular research topics in management and psychology, that is in the field of organizational research related to organizational behavior and human resource management (Van Der Westhuizen, Pacheco, & Webber, 2012; Yahyagil, 2015; Shiu, Hassan, & Parry, 2015).

When it comes to the concept of job satisfaction in the scientific and professional literature, numerous definitions can be found, and some of them are:

- emotional response to different aspects of work (Kinicki & Fugate, 2016);
- the extent to which people love their job (Spector, 2017);
- attitudes and feelings that people have towards work (Armstrong, 2017);
- the degree to which the employee has a favorable or positive feeling about the job and work environment (Hoy & Miskel, 2013) and the like.

What is common to most of the above definitions is that most authors believe that job satisfaction essentially includes work-related feelings that are expressed through employee reactions to various aspects of work (Muterera, Hemsworth, Baregheh, & Garcia-Rivera, 2018). As most definitions contain the importance of feeling or affect and cognition or thinking (Lan, Okechuku, Zhang, & Cao, 2013), it can be said that the concept of job satisfaction contains an affective and cognitive dimension, in the sense that the observed concept develops through affective and cognitive reactions of employees related to their work (Locke, 1969; Organ & Near, 1985; Judge & Ilies, 2004; Rich, Lepine, & Crawford, 2010).

However, a review of the available literature in the observed field shows that in the existing literature, one definition has been singled out that is most often used and cited in various publications. It is a definition given by Edwin Locke back in 1969, according to which job satisfaction is a *satisfactory or positive emotional state that arises as a result of evaluating work or work experience* (Locke, 1969).

Existing theories describe job satisfaction as a complex phenomenon that is related to numerous factors, and whose mutual interaction plays a great role and significance for the survival, growth and development of any organization. Thus, all factors can generally be classified into: (1) causes and (2) effects of changes on the job satisfaction level, although it has been proven that there may be a two-way relationship between certain factors and job satisfaction. Job satisfaction can be viewed in two ways, as: (1) a dependent variable (Balci, 2011) and (2) an independent variable (Schermerhorn, Hunt, Osborn, & Uhl-Bien, 2012).

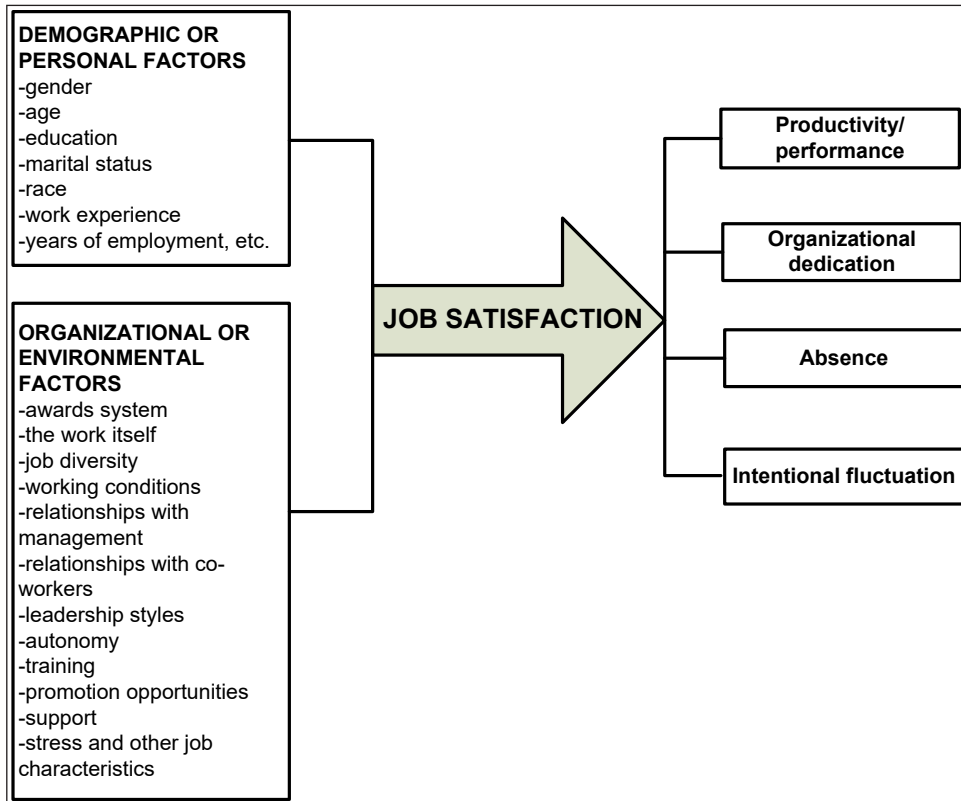
If job satisfaction is viewed as a dependent variable, the literature most often cites and uses a classification according to which all factors can be grouped into two basic categories, namely: (1) demographic or personal factors and (2) environmental factors or organizational factors (Crossman & Harris, 2006). In doing so demographic (Ashraf, 2020) or personal factors include personal attributes or characteristics of employees (gender, age, education, marital status, race, work experience, work experience in the organization, etc.), while environmental factors or organizational factors refer to factors related to the work itself or working environment.

The most significant outcomes of job satisfaction are most often mentioned: productivity or performance, organizational commitment, absence and intention to leave the job (Gómez-Mejía, Balkin, & Cardy, 2016).

Based on the performed analysis, it can be concluded that job satisfaction is a complex concept that is related to a large number of factors (Soomro & Shah, 2019). All factors related to the observed concept can be classified into two groups, where the factors that affect the level of job satisfaction are the causes or determinants of job satisfaction, while the factors that can be affected by job satisfaction are the outcomes, i.e., consequences or effects of job satisfaction. Thus, job satisfaction in relation to the factors from the first group is viewed as a dependent variable, while for factors from

the second group, job satisfaction is an independent variable. Based on a review of the literature (Huynh & Hua, 2020) and the aforementioned analysis, the association of factors with job satisfaction can be presented using Figure 1 which identifies the most important causes and effects of changes in job satisfaction levels.

Figure 1. Causes and effects of changes in the level of job satisfaction



Source: Authors

Process organization of the company

Processes consist of interconnected activities through which the transformation of input quantities or inputs into final outcomes or outputs (Zaheer, Rehman, & Khan, 2010), or related activities that operate within the boundaries of the organization in order to enable organizational units to connect and act together. Thus, processes have a beginning and an end, clearly defined inputs and outputs, and human, information and other resources are necessary for their development. Processes refer to the way in which existing resources are used to achieve defined goals. Together with lateral connections, processes represent a means for coordination and integration of activities, i.e., a means by which the barriers set by the structure are overcome.

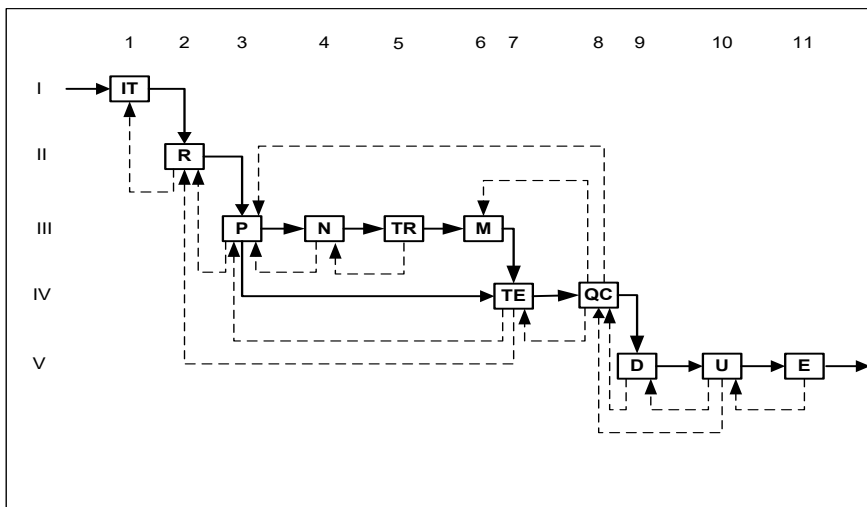
The business system has the function of a business process and the following set of working systems:

$$POS = f(IT, R, K, P, N, TR, M, TE, QS, D, U, S, RU, PK, F, OI)$$

Where the operating systems are:

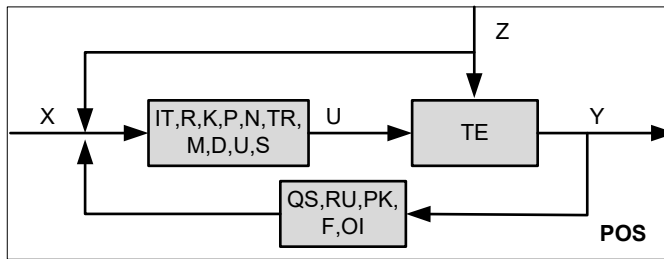
- IT - research of market needs for the process results,
- R - development of a prototype of the future process result,
- K - construction of process results,
- P - production planning and preparation,
- N - procurement of raw materials and equipment for the development of process results,
- TR - external and internal transport of materials, equipment and process results,
- M - warehouse for materials, equipment and process results,
- TPP - technology of machining parts and assembly of process results,
- Q - management and quality assurance of process results,
- D - sales and distribution of parts and process results,
- U - installation or assembly of the product at the place of use,
- S - servicing or maintenance of the product at the customer or user,
- RU - management,
- P - legal and personnel affairs,
- F - finance and accounting,
- OI - asset security and electronic information processing.

Figure 2. Business system process functions



Source: (Todorović, Upravljanje kvalitetom, 2009)

The business system has the scheme shown in Figure 3. On the direct branch and in the working coupling of the business system, there are working systems IT, R, K, P, N, TR, M, D, U, S and TE.

Figure 3. Business process scheme

Source: (Todorović, Upravljanje kvalitetom, 2009)

At the entrance X to the business system, there are: the required energy, raw materials, semi-finished products, production materials and documentation with business tasks. The business system is inevitably affected by disturbances of Z of different character: poor planning, delays in work, lack of financial resources, unfulfilled contracts, strikes, atmospheric disasters, etc. which adversely affect the system and interfere with its business. At the exit Y from the business system, there are: work spent and lost, jobs done and data on business realized.

In the feedback branch and coupling of the business system, there is the QS system as well as the RU, PK and F systems, as well as the OI. They receive the information Y with the data on the realized business at the output of the business system, compares it with the information X with the business tasks at the entrance, in order to perform the necessary management in the business according to the difference (X-Y).

In order for an organization to be efficient and effective, a “process approach” needs to be applied. Business process optimization (Todorović, Todorović, & Tomaš, Uloga interne revizije u borbi protiv kompjuterskog kriminala, 2020) is achieved by presenting processes transparently, aligning them with business strategy and specific operational requirements, and optimizing and computerizing in accordance with good process management practices, and then having them continuously monitored, adapted and improved.

When it comes to the impact of organizational processes and their dimensions on job satisfaction, a review of the literature identified five studies that, among other things, analyze the existence and nature of the relationship between process and job satisfaction (Carbonell & Rodriguez-Escudero, 2013; Tomažević, Seljak, & Aristovnik, 2014; Zhu, Xie, Warner, & Guo, 2015; Pacheco & Webber, 2016; Xia, Zhang, & Zhao, 2016). Based on the analysis of the aforementioned research, and which studies the impact of processes and their dimensions on job satisfaction, it can be concluded that previous research, which is not numerous, does not observe the overall impact of the process on job satisfaction. The analysis of previous studies shows that the subject of research was most often participatory decision-making, that is the involvement of employees in the decision-making process, so in previous research done, only individual processes, that is their individual dimensions, were analyzed.

RESEARCH METHODS

With the intention to best solve the research problem, the set research goals and the research hypothesis, we chose a quantitative research methodology.

A survey method was used to collect the data. The introductory part of the questionnaire lists the characteristics of the respondents and general information about the organization. The second part lists the process factors that affect job satisfaction, which are:

- Accuracy and understanding of the decision-making process,
- Opportunity to participate in the decision-making process that is important for the business,
- Opportunity to participate in the process of making important decisions at the level of the organization,
- Accuracy and comprehensibility of the communication process,
- Availability of information needed to do the job,
- Availability of other information,
- Quality of feedback,
- Resource availability,
- Quality of communication with the manager and
- Quality of communication with co-workers.

Factors were evaluated based on the Likert scale from 1 to 5 in two categories: importance and satisfaction. The assessment of importance goes from: 1. It doesn't matter to me at all, 2. It doesn't matter to me, 3. It is moderately important to me, 4. It is important to me and 5. It is very important to me. Satisfaction rating goes from: 1. I am not satisfied at all, 2. I am not satisfied, 3. I am moderately satisfied, 4. I am satisfied and 5. I am completely satisfied.

Data processing was performed on the basis of statistical software for social sciences - SPSS (Statistical Package for Social Sciences - SPSS).

Data analysis was performed on the basis of methods used in management and organization, which are: Cause and effect analysis, Similarity diagram, Interrelationship diagram and Field of influence analysis.

The target population includes a set of all organizations (economic entities) that are registered in the Chamber of Commerce of the Republic of Srpska, while the target respondents are workers who are employed in organizations. The choice of the Chamber of Commerce as a database for determining the target population is justified by the fact that it is an organization whose members are companies, banks, insurance companies and other financial organizations that perform business activities in the Republic of Srpska, as well as the fact that, based on the Republic of Srpska Register Rulebook (Official Gazette of RS, No. 121/08) and the Law on the Chamber of Commerce of Republic of Srpska (Official Gazette of RS, No. 65/08), the Chamber of Commerce is the only authorized institution in charge of establishing and maintaining the Republic of Srpska Business Register.

From the set of 3,824 total registered organizations (as of April 25, 2017), micro-organizations (organizations that employ up to 5 workers) are excluded, given the fact that there are not any clearly defined and built organizational systems, as well as sufficiently developed elements. processes in the organization. This leads to the target

population, which consists of a set of 1,073 organizations from the Republic of Srpska, where the target respondents are all workers who are employed in the given organizations.

The planned sample size was calculated using various formulas showing that for a final population consisting of 1,073 elements, with a most commonly used confidence level of 95% and a marginal error of 5%, a sample consisting of 283 elements¹ was sufficient.

In that way, a simple, random sample of 283 organizations was registered in the Business Register of Republic of Srpska, where the planned number of respondents is a set of all workers employed in the selected organizations, and whose total number is 6,983 workers. The selection of a random sample in the first stage (6,983 workers) enabled the implementation of empirical research, where in the second stage the response of all workers from the selected organizations was expected.

The procedure of collecting empirical data, which included sending the created questionnaire to all employees of the organizations selected in the sample and collecting answers from the respondents, lasted in the period from June to November 2018. After six months, a total of 794 respondents completed the questionnaire. However, all respondents who did not fill in the questionnaire properly, as well as those who did not answer all the questions, were eliminated from the sample. Thus, by eliminating the questionnaire with the missing data, 738 respondents participated in the conducted empirical research, which is the final sample of respondents. As of the planned 6,983, 738 respondents completed the questionnaire, the response rate in the survey was 10.57%, which is an acceptable response rate when it comes to organizational surveys (Baruch & Holtom, 2008). However, there was a non-random or non-sample (systemic) error due to the absence of answers from the respondents in the research. This error occurred because many respondents who were included in the study did not provide answers.

THE RESEARCH RESULTS

Table 1 shows the average rated level of importance of the identified process dimensions. The obtained results show that the respondents from the sample on average consider that all the stated dimensions of the process are important for their work (the assessed level of importance for each aspect has a value above the neutral environment, with nine out of ten aspects having average ratings between “important” and “very important”). This confirmed the results of the pilot study, so the inclusion of all identified dimensions in the proposed sub-scale for assessing satisfaction with the processes is further justified. Given that all identified process dimensions are rated as important on average, no correction is required. If the identified dimensions are ranked according to the assessed level of importance, it can be noticed that for the respondents from the sample, the most important is the availability of information needed to do the job (fifth dimension), where the respondents’ answers deviated the least from the

¹ Starting from the formula for marginal error: $z \cdot \sqrt{\frac{p(1-p)}{n}} \sqrt{\frac{N-n}{N-1}} = 0,05$ we get:

$$1,96 \cdot \sqrt{\frac{0,5 \cdot 0,5}{n}} \sqrt{\frac{1073-n}{1072}} = 0,05, \text{ where it follows: } n = 283.$$

arithmetic mean. On the other hand, the assessed level of importance is the lowest for the third dimension, which refers to the possibility of participating in the process of making important decisions at the organizational level, and where the average largest deviation of respondents' answers from the arithmetic mean.

Table 1. Descriptive measures of the process-related subscale (importance of dimensions)

Variable	Sample size	Arithmetic means	Standard deviation
Accuracy and understanding of the decision-making process,	738	4.05	.882
Opportunity to participate in the decision-making process that is important for the business,	738	4.36	.763
Opportunity to participate in the process of making important decisions at the level of the organization,	738	3.67	1.069
Accuracy and comprehensibility of the communication process,	738	4.14	.786
Availability of information needed to do the job,	738	4.50	.674
Availability of other information,	738	4.22	.765
Quality of feedback,	738	4.36	.732
Resource availability,	738	4.44	.710
Quality of communication with the manager and	738	4.47	.725
Quality of communication with co-workers.	738	4.34	.795

Source: Based on the exit from the SPSS

By including control variables in the analysis, it can be determined whether the average assessed level of importance of individual dimensions differs by groups of respondents formed on the basis of control variables.

To determine whether the calculated differences between groups of subjects were statistically significant, two tests were used, the Mann-Whitney Test and the Kruskal-Wallis Test. Due to the large number of control variables, only data on p values are shown in Table 2.

Table 2. Summary data on p values (testing the statistical significance of differences between groups of respondents) - subscale related to processes (importance of dimensions)

Variable	VP1	VP2	VP3	VP4	VP5	VP6	VP7	VP8	VP9	VP10
Gender*	.824	.793	.550	.534	.927	.296	.423	.838	.168	.552
Age**	.001	.151	.088	.285	.687	.282	.159	.302	.266	.049
Level of Education**	.000	.199	.000	.112	.053	.328	.288	.017	.359	.008
Position*	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Work experience**	.002	.149	.090	.225	.105	.247	.159	.468	.505	.345
Work experience in the organization**	.109	.367	.026	.970	.470	.523	.979	.909	.424	.429
Size of the organization**	.392	.744	.565	.848	.552	.961	.088	.077	.474	.763
Ownership structure*	.681	.026	.788	.538	.417	.370	.129	.370	.777	.594
Activity*	.424	.718	.769	.183	.248	.968	.937	.487	.525	.291

* Mann-Whitney Test

** Kruskal-Wallis test

Ho: There are no statistically significant differences between groups of respondents.

H1: There are statistically significant differences between groups of respondents.

Source: Author's calculation

In order to determine which groups of subjects statistically significant differences in the estimated level of importance of individual dimensions of the process there are (in the case when the control variable forms three or more groups of subjects), an additional analysis was performed using the Mann-Whitney Test.

It can be concluded that there are statistically significant differences between certain groups of respondents in the assessed level of importance of certain dimensions of the process. Also, it can be noticed that the position of the respondents is the only control variable in which there are statistically significant differences in all observed dimensions of the process (p value is less than 0.05). On the other hand, statistically significant differences in the estimated level of importance of the observed dimensions of the process do not exist in groups of respondents formed on the basis of gender of respondents, size and activity of the organization. For other control variables, statistically significant differences between groups of respondents exist only for certain dimensions of the process, namely: age (two dimensions), level of education (two dimensions), work experience (one dimension) and work experience in the organization (one dimension).

The relationship between the individual dimensions of the process can be analyzed on the basis of the average assessed degree of satisfaction with each of the dimensions, and descriptive measures (arithmetic mean and standard deviation) are presented in Table 3.

Table 3. Descriptive measures of the subscale related to processes (dimensional satisfaction)

Variable	Sample size	Arithmetic means	Standard deviation
Accuracy and understanding of the decision-making process,	738	3.51	1.068
Opportunity to participate in the decision-making process that is important for the business,	738	3.41	1.128
Opportunity to participate in the process of making important decisions at the level of the organization,	738	3.34	1.092
Accuracy and comprehensibility of the communication process,	738	3.55	1.062
Availability of information needed to do the job,	738	3.59	1.059
Availability of other information,	738	3.51	1.085
Quality of feedback,	738	3.53	1.076
Resource availability,	738	3.54	1.086
Quality of communication with the manager and	738	3.57	1.091
Quality of communication with co-workers.	738	3.97	.935

Source: Based on the exit from the SPSS

The previous table shows the average rated level of satisfaction with the identified process dimensions. Based on the collected data, it can be seen that the respondents are on average satisfied with the existing processes in the organization, given that the average estimated value of respondent satisfaction with each of the aspects is above a neutral median. If the identified dimensions of the process are ranked according to the assessed level of satisfaction, the previous table shows that the average level of satisfaction of respondents is highest in the tenth dimension (quality of communication with associates), while the average level of satisfaction is lowest for the third dimension (opportunity to participate in the process of making important decisions at the level of the organization). The largest average deviations of respondents' answers from the arithmetic mean are present in the second dimension (possibility to participate in the decision-making process that is important for the job), while the smallest deviations occur in the tenth dimension (quality of communication with associates).

To determine whether the calculated differences in the estimated level of satisfaction with individual items were statistically significant, the Mann-Whitney Test and the Kruskal-Wallis Test were used. Due to the large number of control variables, only data on p values are shown in Table 4.

Table 4. Summary data on p values (testing the statistical significance of differences between groups of respondents) - subscale related to processes (dimensional satisfaction)

Variable	VP1	VP2	VP3	VP4	VP5	VP6	VP7	VP8	VP9	VP10
Gender*	.661	.476	.444	.788	.378	.377	.090	.007	.074	.216
Age**	.209	.637	.301	.354	.444	.047	.225	.418	.348	.008
Level of Education**	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001
Position*	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
Work experience**	.139	.603	.327	.564	.764	.766	.712	.925	.653	.189
Work experience in the organization**	.489	.632	.582	.615	.215	.633	.863	.435	.284	.324
Size of the organization**	.005	.009	.204	.004	.003	.008	.011	.005	.008	.038
Ownership structure*	.003	.004	.071	.000	.001	.002	.008	.038	.001	.149
Activity*	.182	.220	.462	.310	.378	.124	.457	.128	.793	.693

* Mann-Whitney Test

** Kruskal-Wallis test

Ho: There are no statistically significant differences between groups of respondents.

H1: There are statistically significant differences between groups of respondents.

Source: Author's calculation

To determine between which groups of subjects there are statistically significant differences in the estimated level of satisfaction with individual dimensions of the process (in the case when the control variable forms three or more groups of subjects), an additional analysis was performed using the Mann-Whitney Test.

It can be concluded that there are statistically significant differences between certain groups of respondents in the assessed level of satisfaction with certain dimensions of the process. In the two control variables (level of education and position of the respondents) there are statistically significant differences in all observed dimensions of the process (p value is less than 0.05). Also, statistically significant differences in the assessed level of satisfaction for most of the observed dimensions of the process exist among respondents who come from organizations of different sizes (nine dimensions), as well as among respondents employed in organizations that differ in ownership structure (eight dimensions). However, there are control variables in which there are no statistically significant differences in the estimated level of satisfaction with the observed dimensions of the process (work experience, work experience in the organization and the organization), as well as control variables in which statistically significant differences in the estimated level of satisfaction exist in only one process dimensions (gender and age of respondents).

Correlation analysis was applied to test the hypothesis, and the results of the analysis are shown in Table 5.

Table 5. Testing of the hypothesis (Spearman's correlation coefficient)

		ZP	UZP
Spearman's coefficient	Correlation coefficient	1.000	.883**
	p - value (two-way test)	.	.000
	Sample size	738	738
	Correlation coefficient	.883**	1.000
	p - value (two-way test)	.000	.
	Sample size	738	738

** Correlation is significant at level 0.01 (two-way test)

Ho: In the set, there is no correlation between the observed variables.

X1: In the set there is a correlation between the observed variables.

Source: Based on the exit from the SPSS

Based on the calculated value of the correlation coefficient in the sample ($r_s = 0.883$) and the calculated p value ($p = 0.000$), several conclusions can be drawn:

- The correlation coefficient is positive (there is a direct monotonic relationship in the sample),
- There is a strong correlation in the sample,
- For any level of significance, it can be concluded that there is a quantitative correlation of the observed variables, i.e., that the observed relationship is statistically significant.

The previous table proves the existence of a statistically significant relationship between process satisfaction (calculated based on satisfaction with identified process dimensions) and overall job satisfaction. As the calculated correlation is strong, and the degree of correlation is positive, it can be stated that the respondents with a higher degree of satisfaction with the processes have a higher degree of overall job satisfaction, and vice versa.

As it has been proven that there is a strong correlation in the sample between process satisfaction and overall job satisfaction, and as the analysis showed that processes, together with their dimensions, were assessed as “important” for respondents’ work, it can be concluded that processes are an important satisfaction factor. business.

DISCUSSION

Regarding similar research conducted in countries in the region, a literature review found only one study (Tomažević, Seljak, & Aristovnik, 2014) that focused on analyzing the impact of individual elements of organizational design on job satisfaction. Table 6 presents the theoretical, methodological and conceptual aspects of the analyzed research.

In this research, the influence of two elements of organizational design (strategy and processes) on job satisfaction was analyzed. Processes were analyzed through satisfaction with the characteristics of organizational processes, quantitative methodologies were used, and primary and secondary data were collected using a questionnaire. The research was conducted on large samples, where the respondents were residents of one country from the region.

Table 6. Theoretical, methodological and conceptual aspect of research from the region in which the impact of the process in the organization on job satisfaction is studied

SN	Authors	Independent variables	Dependent variables	Control variables	Methodology	Respondents	Data source	Number of org.	Number of respondents	Country	Result
1.	Tomažević et al., 2014	Joint Assessment Framework (EU): leadership, strategy and planning, people, partnership and resources, processes	Job satisfaction	age, gender, level of education	quantitative, survey	workers employed in a law enforcement institution	secondary	1	1848	Slovenia	+

Source: Author (based on the sources listed in the table)

The results of this research show that process satisfaction is correlated with total satisfaction (correlation coefficient has a value of 0.513). To assess the elements of the organizational process and job satisfaction, Likert's glass with five degrees was used, as in our research. The results show that the respondents are dissatisfied with the existing processes (the average rated satisfaction is 2.77).

CONCLUSION

Identified process dimensions are important for the respondents' jobs - respondents included in the sample on average believe that all identified process dimensions are important for their work, with respondents having the most important information available to do the job, while the assessed level of importance is the lowest for a dimension related to the possibility of participating in the process of making important decisions at the level of the organization. Statistically significant differences in the average estimated degree of importance of certain dimensions of the process exist in groups of respondents formed on the basis of: age, level of education, position, work experience, work experience in the organization and ownership structure of the organization. Respondents included in the sample are on average satisfied with the existing processes in the organization, where the average rated level of satisfaction of respondents is the highest in the dimension related to the quality of communication with associates, and the lowest for the dimension related to the ability to participate in important decision-making. Statistically significant differences in the average estimated degree of satisfaction with certain dimensions of the process exist in groups of respondents formed on the basis of: gender, age, level of education, position, size and ownership

structure of the organization. The correlation between process satisfaction and overall job satisfaction is statistically significant, the calculated correlation is strong, and the degree of correlation is positive ($r_s = 0,883$, $p = 0.000$), which shows that respondents with a higher degree of process satisfaction have a higher degree of overall job satisfaction. Processes are an important factor of job satisfaction - as it has been proven that there is a strong correlation between process satisfaction and overall job satisfaction, and how processes, together with their dimensions, are rated as "important" for respondents' work, it can be concluded that the hypothesis claiming that *processes, as an element of organizational design, affect job satisfaction* has also been confirmed. The conducted research has numerous consequences both on theory and practice, and the basic implications of the work can be seen through the scientific and pragmatic contribution achieved by conducting theoretical and empirical research. The scientific contribution was achieved through the definition of a conceptual research model which enables a comprehensive study of the impact of processes in the organization on job satisfaction, given that the chosen model includes various elements of the process in the analysis. Managers of various organizations received specific recommendations and data on the assessed degree of importance and degree of satisfaction with certain characteristics of the process in the organization. Also, managers were given a tool which they can use to measure and evaluate the importance of various characteristics and process factors in the organization for employees, as well as employee satisfaction with these characteristics and factors. In this way, the negative effects that occur as a result of employee dissatisfaction with certain organizational characteristics of the process can be reduced and all the positive consequences that provide an increase in job satisfaction can be used.

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DO CLUSTERS AND BUSINESS ENVIRONMENT FOSTER NATIONAL COMPETITIVENESS IN BULGARIA? A COMPARATIVE STUDY WITH EU COUNTRIES

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Abstract: *The business environment and cluster development in given economy have a defining role for the development, maintenance and enhancement of national competitiveness and this has been proven repeatedly in theory and in practice. Cluster development in Bulgaria started with some delay compared to the other European countries. In Bulgaria, companies even though being a member of a cluster; they do not fully realize their advantages in terms of competition and joint efforts. The reason is that clusters in Bulgaria are still in a process of building efficient internal interactions between their members. The study focuses on the way and the extent the state of business environment and cluster development foster national competitiveness in the case of Bulgaria and selected Central and Eastern European EU member states countries. For the purposes of the study of business environment the Diamond Model of Michael Porter is employed and it is carried out through the World Economic Forum's indicators of Global Competitiveness Reports. Both, business environment and the level of cluster development in Bulgaria are evaluated in a comparative context with selected Central and Eastern European EU member states countries. The results of the study show domination of limitations and obstacles to enhancing national competitiveness. We may conclude that the state of the business environment, the level of cluster development, and their interaction are not very favourable for more intensive competitive development of Bulgarian economy.*

Keywords: clusters; competitiveness; business environment; Bulgaria; EU countries.

JEL classification: C38, M21.

INTRODUCTION

Achieving and maintaining national competitiveness in the global economy is a challenge that nations approach in a different way. Relative to the strong historical dependency of the aggregate institutional factors emphasized in the macroeconomics literature, policymakers (and even private sector leaders) have significant latitude to strengthen microeconomic competitiveness by enhancing the national business environment, enabling cluster development, and improving the sophistication of company operations and strategy (Delgado, Ketels, Porter, & Stern, 2012:2). Business environment is understood as internal and external factors for the companies that affect their functioning and outcomes. The focus of the article are issues related to national competitiveness, that are of high significance for any economy and attract growing attention of politicians, academic circles and researchers: the role of the business environment, the extent of cluster development, and the interaction between the two, as a premise to enhance national competitiveness.

The main research question of the study is: Do the business environment and cluster development foster the enhancement of national competitiveness?

The research is structured as follows: in the first part, a brief literature review of the basic concepts as competitiveness, clusters, business environment is presented. The second part introduce the research methodology, including the research hypotheses of the study. The third part discuss the results of the study and conclusions are derived in regard to the state of the business environment and the degree of cluster development in Bulgaria, as well as their interaction as a premise to enhance national competitiveness. Finally, the conclusion highlights the favorable prerequisites and problematic areas for the future development and enhancement of Bulgarian economy's competitiveness.

The study of the business environment is developed through the Diamond Model of Porter. Each determinant of national advantage (factor conditions; firm strategy, structure and rivalry; demand conditions, related supporting industries) (Porter, 2004) is characterized (analyzed and evaluated) using indicators of the World Economic Forum from the Global Competitiveness Reports. The research on the cluster development in Bulgaria is carried out in a comparative context with the Central and Eastern European EU member states, taking into account the fact that the extent of their development is a manifestation of historical and geographic determinism (Solvell, Lindqvist, & Ketels, 2003). Comparative analysis, descriptive statistics, and correlational analysis were applied for the purposes of the study.

COMPETITIVENESS, CLUSTERS, BUSINESS ENVIRONMENT: A BRIEF LITERATURE REVIEW

National competitiveness

Achieving and maintaining national competitiveness in the global economy is a challenge that nations approach in a different way. The fact that different nations belong to different stages of economic development (most generally - developed and developing countries) and the need to deal with different historical and economic predispositions explain the variety of perceptions and models of national competitiveness.

The notion "national competitiveness" is more strongly contested than "competitiveness" of firms and regions (Lachmann, 2001). Well-known are the statements of

scientist and researchers who disagree about the notion (Krugman, 1994; De Grauwe, 2010). Most of these arguments emanate from the ideas of the international trade theory. Krugman, the most prominent opponent of national competitiveness, supports the idea that countries do not engage in trade as in a zero-sum game. Similar idea can be found with Andrea Boltho "If a certain country grows, possibly faster than the others, then the global markets will expand, and all foreign trading partners will benefit from the availability of better or cheaper products and from more favourable terms of trade. Consequently, there are neither winners nor losers" (Boltho, 1996:1-16).

There is also a lack of consensus about the definition of competitiveness (Bristow, 2005; Greene, Tracey, & Cowling, 2007; Martin, 2005; Thompson, 2004). "In practice, there is a dichotomy in how policy makers think about competitiveness: On the one hand, competitiveness is associated with qualities that enable a high standard of living (e.g., a country like Sweden is prosperous because of its high competitiveness). On the other hand, competitiveness is associated with locational attributes that drive growth..." (Delgado, Ketels, Porter, & Stern, 2012:2). Michael Porter, an authority in the field of competitiveness, provided a systemic view of competitive advantage of nations through the "Diamond model". According to him, four and interlinked are the main groups of factors determining national competitiveness: factor conditions, demand conditions, related and supporting industries, and firm strategy, structure and rivalry. Porter builds that model on the premise that the productivity of factors determines the competitiveness of the economy (Porter, 2004). Garelli, the director of the World Competitiveness Centre, states that "competitiveness is not an objective, by itself, but an economic tool. However, a tool is linked and dependent on the objectives pursued by the various economic actors, which constitute a nation" (Garelli, 2012:488-489).

This is the reason competitiveness is considered to be a dynamic concept that implements three ideas: (1) to be efficient, (2) to make choices, (3) in what way the disposable resources are being used. Different definitions, to a different extent, stress on one or some of these ideas (Global Competitiveness Index WEF, 2016:4; Tyson, 1992).

What Flanagan, Lu, Shen and Jewell conclude in their research is that "The plethora of definitions is a proof of the diversity, inclusivity and complexity of the concept." (Flanagan, Lu, Shen, & Jewell, 2007:990). What is common between the most accepted and used definitions of national competitiveness is that the successful (economic) performance typically is judged in terms of rising standard of living or real incomes and open type of market conditions (Bankova, 2015:114-123). Flanagan et al (Flanagan, Jewell, Ericsson, & Henricsson, 2005) stress that "Competitiveness may be described as something that is multi-defined, multi-measured, multi-layered, dependent, relative, dynamic and process related."

What can be outlined is that competitiveness is usually defined in terms of the outcome(s) (ex. standard of living/incomes) rather than the factors that determine competitiveness. Scholars have come up with different sources of national competitiveness. They include, among others, relative labour costs real exchange rate, manufacturing, knowledge-intensive service sector, foreign direct investment, technology, innovation, institutions and government policies, and regulations. What is common about them is that the level of sophistication of the factors raises. To create and sustain competitive advantage over the time factors of a higher order are needed. These are factors that

cannot be easily copied. That is why so much attention is paid to the knowledge and innovations. Moreover, the application of modern technologies has changed significantly the role of most common factors of competitiveness. Globalisation also matters. According to Tanushev “The diversity of relationships raises a number of contradictions that should be taken into account in the activities of governments, corporations, non-government organizations, and people.” (Tanushev, 2016).

Nowadays beside the innovation competitiveness depends increasingly on the ability of the companies to co-operate, the effectiveness of the public administration and political decisions that aim at creating more favourable external environment for the companies (Bankova, 2011). Michael Porter (Porter, 2004), claims that “firms compete in industries, not nations”. It is also true that the *economic value is indirectly generated by nations through enterprises* hence the main and most important role of the nations (countries) is to establish an environment that supports the activities of enterprises. National Governments continue to shape the competitiveness environment in different ways via taxation, education, health issues and recently through the application of cluster policy. Clusters presume a co-operation and innovation that’s why they are perceived as a key driver for achieving a sustainable competitiveness.

Clusters

A cluster, according to Porter, is “a geographic concentration of interconnected companies and associated institutions in a particular field, which are community bound and mutually complementing. The geographic scope of the cluster can be a region, country or even a separate town, around which it could be situated, or neighboring countries ... Being more than individual industries, clusters encompass a series of related industries and other organizations of importance for competition” (Porter, 2003:199). Due to the high geographic concentration of companies connected vertically or horizontally in a given industry (Madsen, Smith, & Dilling-Hansen, 2003:5), as well as the wide scope of possible participants in the cluster (the business, educational institutions, local authorities, state institutions, non-governmental organizations), clusters represent a specific form of collaboration (Knauseder, 2009), which has been acquiring great importance in recent years. Clusters are developing in all countries, and the stage of their emergence varies (Oxford Research, 2008).

Clusters, as already stated, have been the subject of many studies which prove the need for their development and outline their role in several directions. Predominant are those which concentrate mainly on the economic advantages of clusters and focus on innovations to improve competitiveness. Clusters are perceived as drivers of competition, innovations and regional development (Garanti, Zvirbule-Berzina, & Yesilada, 2014); they provide the companies forming a given cluster with easy access to important resources, reduction of transportation costs, access to consumers and labour (Marshall, 2009; Porter, 2000; Krugman, 1993). Clusters are defined as a dominant factor nowadays (Dumais, Ellison, & Glaeser, 2002), both in reducing transaction costs and providing access to specialized services (Shott, 1988), and development of infrastructure and competitive business environment (Lin, Tung, & Huang, 2006), which leads to enhanced efficiency and productivity. Besides, the advantages of clusters, “resulting from local embeddedness and spatial proximity, strategic cooperation and constructive competition, as well as the considerable influence of external players can

be used to promote responsible business practices and joint CRS activities” (Slavova, 2014:61).

According to Porter *clusters represent a new way of thinking about national and local economies*, and they necessitate new roles for companies, government, and other institutions in enhancing competitiveness (Porter, 2000) as well as that ... clusters represent a new and complementary way of understanding an economy, organizing economic development thinking and practice, and setting the public policy (Porter, 2000). While in the different definitions of clusters (Rosenfeld, 1997; Feldman, Francis, & Bercovitz, 2005) the accent is placed on different aspects, the clusters concept usually has three important dimensions.

First, it is widely accepted and indisputable to view clusters as a geographic concentration of specialized companies, advanced skills and competences of the workforce, as well as support for institutions, which increase knowledge flows and their dissemination, as a result of their proximity. This grouping of different strengths is often called a prospective strategy for maintaining competitiveness on a global scale.

Second, clusters include a network of joint/cooperative enterprises (businesses which have officially established, economic and social ties among them). They offer good functions for providing a set of specialized and personalized services to a particular group of companies, such as the provision of specialized infrastructure, specific support for the business by means of consulting services or training. In this sense, clusters are a form of “self-organization”, which offers competitive advantages. It is believed that geographic proximity facilitates the transfer of knowledge flows and unplanned interactions, which are important elements of the innovation process.

Third, clusters are characterized by a certain dynamic social and organizational element, the so-called “institutional attachment/fixing” – various interconnected innovation actors are attracted, such as universities, research institutes; non-governmental and governmental organizations, public authorities - in this way the intensive interaction and cooperation between them is facilitated. Rocha and Sternberg (Rocha & Sternberg, 2005) call the third dimension of clusters a network of cooperative organizations (it is not only companies that are connected, but also various governmental and non-governmental organizations, including educational institutions).

EU countries began to develop and implement cluster development policies in the early 1990s. Models of formation, growth and development agree on the general principles of cluster existence, but each country has its own ways of realizing these principles.

Cluster formation programs are aimed at encouraging innovation and dissemination of knowledge, as well as the development of technologies. In many post-socialist European countries, such as Bulgaria, projects have been implemented to promote the best practices gathered through observation, which is the basis for analysis. Today, cluster development policies are increasingly focused on the development of existing clusters, on their improvement by connecting with local development and research institutions, universities and the local community. (Mitrović & Mitrović, 2020:258)

Clusters and business environment

“A nation’s economy contains a mix of clusters, whose makeup and competitive advantage (or disadvantage) reflect the state of the economy’s development”. (Porter,

2004). Countries and regions, regardless of the supposed homogenizing effects of globalization, still manifest substantial differences in terms of specialization, competitiveness and industrial dynamics. Successful industries and industrial clusters in a country or region often maintain their leading advantage over long periods of time, despite the efforts of others to imitate their success. Sustainable competitive advantage is created by a combination of internal and external resources existing in the national and local business environment, where strategic decisions are taken and entrepreneurial activity is formed (Solvell, Lindqvist, & Ketels, 2003).

In business environment, there is a tendency for resources and capacities to renew themselves in a mutually strengthening process, and as research shows (Lin, Tung, & Huang, 2006; Solvell, Lindqvist, & Ketels, 2003; Porter, 2004) cluster dynamics play a decisive role in the process of building and developing a competitive business environment. Dynamic business environment, most often represented by Porter's Diamond, consists of a process of improvement and specialization of the production factors and infrastructures, growing demand (domestic and foreign), intensive rivalry and collaboration, development of competitive related supporting industries (Porter, 2004). Dynamic environment acts as a driver of cluster growth and innovations. (Solvell, Lindqvist, & Ketels, 2003). Based on the understanding established in economic theory and practice of the interaction between the business environment and clusters—on the one hand, dynamic clusters are of decisive importance for the development of a competitive business environment, and on the other, dynamic environment acts as a driver of cluster growth and innovations (Solvell, Lindqvist, & Ketels, 2003). The research, presented in the article, studies the state of cluster development and the business environment in Bulgaria and their interaction, in an attempt to answer the research question: “Do clusters and the business environment in Bulgaria foster the national competitiveness?”

RESEARCH METHODOLOGY

The paper aims to study the state and connection between cluster development and the business environment in Bulgaria (in a comparative context with Central and Eastern Europe EU member states) on the one hand, and their role as a prerequisite for enhancing national competitiveness, on the other.

The brief literature review related to competitiveness, clusters and business environment and the goal of the research lead to the formulation of three research hypotheses.

- Hypothesis 1: The business environment in Bulgaria is similar to that in Central and Eastern European EU member states and it fosters the development of clusters and enhancement of competitiveness.
- Hypothesis 2: There is an interaction between the business environment and the state of cluster development in Bulgaria.
- Hypothesis 3: The development of clusters and the business environment in Bulgaria support the enhancement of national competitiveness.

The study is based on Porter's “Diamond” and the indicators used are grouped according to the four determinants of national competitiveness: factor conditions; firm strategy, structure and rivalry; demand conditions, related supporting industries (Por-

ter, 2004). The main information source used is the Global Competitiveness Reports of the World Economic Forum and only those indicators (factors)¹ were used which, in the authors' opinion and based on the characteristics of the four determinants defined by Porter, most contribute to achieving the research goal. The determinant "factor conditions" is measured via indicators related to human capital, collaboration between the industry and scientific research institutions, financial capital and infrastructure. Three groups of indicators characterize the determinant Firm Strategy, Structure and Rivalry – the first group are related to competition, the second – to firm strategy and creating competitive advantages, and the third – to the conditions for establishing new enterprises. The determinant "Demand Conditions" is represented through the indicators: buyer sophistication and domestic and foreign market size indexes. The "Related Supporting Industries" determinant encompasses the indicators value chain breadth, availability of latest technologies, indicators on the number and quality of local suppliers.

The study applies a comparative method, descriptive statistics and correlation analysis. First, the comparative method is applied to Hypothesis 1. The geographic scope of the study covers the countries which meet the following criteria: (1) countries from Central and Eastern Europe; (2) former socialist countries; (3) EU member states. Ten countries meet these criteria: Hungary, the Czech Republic, Slovakia, Romania, Slovenia, Croatia, Poland, Estonia, Lithuania, and Latvia. The reason they were thus selected is that clusters in Bulgaria, as in other Central and Eastern European countries emerge at a later stage (Garanti, Zvirbulė-Berzina, & Yesilada, 2014) and the extent of their development is a manifestation of the role of historic and geographic determinism (Solvell, Lindqvist, & Ketels, 2003). All countries have experienced the transition from socialism to market economy and are EU member states (accessed at different points in time).

The comparison between the countries encompasses comparisons of business environment factors differentiated according to the characteristics of the four determinants of national competitiveness under M. Porter's Diamond Model. The differences and similarities in the business environment in the countries are established through descriptive statistics. Data from the Global Competitiveness Report 2016-2017 of the World Economic Forum were used.

At the next level, correlation analysis was applied². The object of study are the indicators for Bulgaria characterizing its business environment and the extent of cluster development for the 2016-2017 period. Correlation coefficients were calculated for the "extent of cluster development" indicator and all other indicators included in the study. A t-test for significance was applied and only the significant correlation coefficients are presented and analysed. The analysis leads to the formulation of conclusions based on which the statement in Hypothesis 2 on the importance of the business environment in Bulgaria for cluster development can be confirmed or rejected.

¹ The Global Competitiveness Index is calculated on the basis of both macro- and microeconomic factors, distributed in 12 pillars. These pillars are so grouped that they construct the three main sub-indexes: main requirements; efficiency accelerators; innovation factors, see WEF, Global Competitiveness Index, <https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1>, accessed 31.08.2017

² Correlation analysis was carried out in MS Excel 2016

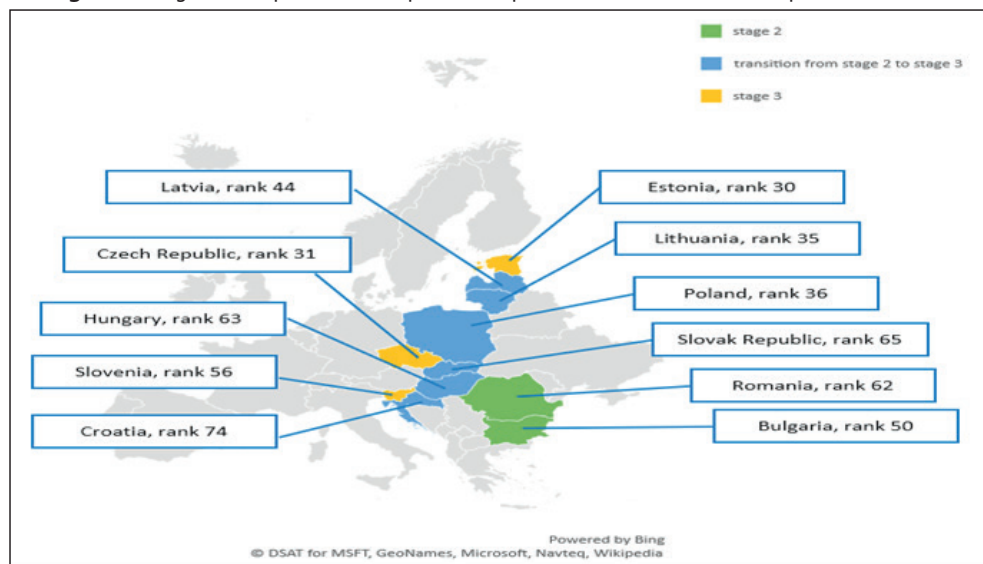
The paper ends with a summary of the main conclusions and results for cluster development and the business environment in Bulgaria as a prerequisite for enhancing the national competitiveness. – supporting or rejecting Hypothesis 3.

RESULTS, DISCUSSION AND CONCLUSIONS

Business environment in Bulgaria in a comparative context

The starting point in studying the business environment is the stage of competitive development of Bulgarian economy. According to the criteria used by WEF in their annual Global Competitiveness Reports (Global Competitiveness Index WEF, 2016:4), countries are differentiated according to the stage of their competitive development (3 basic and 2 transitional stages). Bulgaria is at stage two of competitive development, where it is believed that development and competitiveness depend mainly on efficiency-driven factors (the same holds for Romania). Among the CEE EU member states, Slovenia, Estonia and the Czech Republic are leaders, and thus they have a bigger competitive advantage. They have reached the highest 3rd stage, where development is innovation-driven. All other CEE EU member states are in transition from stage 2 to stage 3, and development there is due to the transition from efficiency-driven to innovation-driven (Figure 1).

Figure 1. Stages of competitive development and position under the Global Competitiveness Index



Source: Compiled by on data from WEF, Global Competitiveness Index 2016-2017

The results of the study of the business environment presented by determinants of national advantage (Porter, 2004) are shown in Table 1. The first research hypothesis, in the part regarding similarity between the business environment where clusters in Bulgaria emerge and develop and that in the Central and Eastern European countries selected for the comparative study, is checked on the basis of indicators obtained via descriptive statistics.

The scores of the countries under the studied 26 indicators which characterize the four determinants of national competitive advantage vary from 2 to 5.6 (in a 1-to-7 scale). Estonia, the Czech Republic, Slovakia, Lithuania and Slovenia most frequently rank high, in varying order under the different indicators, which ranks them among the top 50 in the world (out of a total of 138 countries). Under indicators like “intensity of local competition”, Estonia, the Czech Republic and Slovakia rank among the top 30. Hungary, Croatia, Romania, Lithuania and Bulgaria mostly have lower scores and rank about and under the 100th position.

The results obtained (Table 1) lead to the conclusion that for most of the analysed indicators, Bulgaria's scores are similar to those of the other countries studied. The coefficients of variance give grounds to confirm similarity between the indicators for the eleven countries. The following indicators have the highest degree of homogeneity of the sample: Local supplier quality; State of cluster development; Value chain breadth; Availability of latest technologies; Degree of customer orientation. For the listed indicators, the value of the coefficient of variance is from 5.61% to 9.50%, which according to the rules adopted in statistics (for values up to 10-12%) is viewed as a sign of small dispersion of the feature and homogeneity of the sample.

Table 1. Business environment, presented by determinants of national advantage

			Mean	Standard Error	Median	Mode	Standard Deviation	Sample Variance	Coefficient of variance	Kurtosis	Skewness	Range	Minimum	Maximum	Sum	Count	Bulgaria
Factor conditions	Human capital	1.Quality of the education system	3.55	0.18	3.60	2.90	0.56	0.32	15.84	-0.98	0.27	1.80	2.8	4.6	39.0	11	3.30
		2.Country capacity to retain talent	2.76	0.14	2.60	2.60	0.44	0.20	15.98	-0.57	0.32	1.50	2.1	3.6	30.4	11	2.60
		3. Pay and productivity	4.18	0.13	4.10	4.00	0.42	0.17	9.93	-0.07	0.36	1.50	3.5	5.0	46.0	11	4.00
	Business – university collaboration	4.University-industry collaboration in R&D	3.46	0.13	3.30	3.30	0.40	0.16	11.43	-0.79	0.33	1.20	2.9	4.1	38.1	11	3.40
		5.Quality of scientific research institutions	4.36	0.15	4.20	3.90	0.47	0.22	10.72	-0.66	0.65	1.50	3.8	5.3	48.0	11	3.90
	Financial capital	6.Ease of access to loans	4.01	0.18	4.20	4.60	0.57	0.32	14.21	-1.55	-0.46	1.60	3.1	4.7	44.1	11	4.10
	Infrastructure	7.Quality of overall infrastructure	4.45	0.15	4.50	4.50	0.48	0.23	10.82	0.92	-0.56	1.80	3.4	5.2	48.9	11	3.90
Firm strategy, structure and rivalry	Competition	8.Intensity of local competition	5.17	0.15	5.30	4.80	0.49	0.24	9.44	-0.49	-0.58	1.60	4.2	5.8	56.9	11	4.60
		9.Nature of competitive advantage	3.50	0.14	3.60	3.60	0.44	0.20	12.66	0.56	0.23	1.70	2.7	4.4	38.5	11	3.20
		10.Extent of market dominance	3.85	0.15	3.80	3.80	0.46	0.22	12.06	-0.60	0.29	1.60	3.1	4.7	42.3	11	3.80
	Firm strategy and creation of competitive advantages	11.Capacity for innovation	4.33	0.14	4.30	4.30	0.45	0.20	10.43	-0.97	-0.20	1.40	3.5	4.9	47.6	11	4.30
		12.Company spending on R&D	3.50	0.13	3.40	4.10	0.42	0.18	12.06	-1.19	0.07	1.30	2.8	4.1	38.5	11	3.50
		13. Extent of staff training	3.97	0.14	4.00	3.50	0.45	0.21	11.41	-1.47	0.12	1.30	3.4	4.7	43.7	11	3.50
		14. Extent of marketing	4.24	0.12	4.30	4.60	0.39	0.16	9.29	3.55	-1.71	1.40	3.2	4.6	46.6	11	3.90
		15. Production process sophistication	4.19	0.16	4.10	4.10	0.51	0.26	12.27	-1.24	0.13	1.60	3.4	5.0	46.1	11	3.80
		16. Degree of customer orientation	4.89	0.09	4.90	4.60	0.27	0.08	5.61	-1.23	0.39	0.80	4.6	5.4	53.8	11	4.60

	New entrants	17. Time required to start a business	10.73	2.41	8.00	3.50	7.62	58.11	71.06	2.52	1.53	26.50	3.5	30.0	118.0	11	18.00
		18. Number of procedures required to start a business	4.45	0.58	4.00	4.00	1.83	3.34	41.02	-0.32	0.55	6.00	2.0	8.0	49.0	11	4.00
Related and supporting industries		19. Value chain breadth	3.80	0.08	3.80	3.80	0.26	0.07	6.83	0.02	-0.15	0.90	3.3	4.2	41.8	11	3.80
		20. Availability of latest technologies	5.33	0.12	5.50	5.50	0.37	0.14	6.94	-1.83	-0.54	0.90	4.8	5.7	58.6	11	4.90
		21. State of cluster development	3.52	0.08	3.50	3.50	0.27	0.07	7.55	-0.52	-0.43	0.90	3.0	3.9	38.7	11	3.60
		22. Local supplier quantity	4.40	0.13	4.40	4.40	0.42	0.17	9.50	1.70	-1.09	1.50	3.4	4.9	48.4	11	4.40
		23. Local supplier quality	4.80	0.10	4.90	4.30	0.32	0.10	6.59	-1.20	-0.40	0.90	4.3	5.2	52.8	11	4.60
Demand conditions		24. Buyer sophistication	3.13	0.09	3.20	3.30	0.29	0.08	9.26	-1.25	-0.11	0.90	2.7	3.6	34.4	11	3.30
		25. Domestic market size index	3.85	0.19	3.90	3.20	0.60	0.36	15.62	-0.96	0.10	2.00	2.9	4.9	42.4	11	3.50
		26. Foreign market size index	5.04	0.13	5.10	4.80	0.41	0.17	8.22	-0.83	0.23	1.40	4.4	5.8	55.4	11	4.80

Source: Own computations using data from: WEF, Global Competitiveness Index 2016-2017

Another proof of similarity is the minimal difference between the lowest and the highest score under the indicators shown in the table, taking into account the scope/range of the sample of countries. Under the range indicator, the range of the indicators' values is also small – from 0.8 to 2.0. Two of the total of 26 indicators are an exception - Number of procedures to start a business and Time to start a business (days). Substantial differences between the analysed countries can be observed, as can be seen from the descriptive statistics indicators mentioned above. The time to start a business in Bulgaria is among the serious obstacles for development – 18 days in Bulgaria, at an average for the sample of less than 11 days (10.73) and most frequent 3.50 (mode for the sample). The CEE countries differ the most in the time and number of procedures to start a business, the index for domestic market size, quality of the education system, capacity of the country to retain talent.

Nine of the indicators have values under the average for the sample. The following specifics can be observed among them. Lagging behind in the indicators: quality of the education system, staff training and qualification, domestic market size index (indicators 1, 13 and 25 in Table 1) relative to the average for the sample is not that worrying since their values are equal to or higher than the mode for the studied group of countries.

Most disturbing, generally for the countries covered by the research, is the state regarding the quality of overall infrastructure, extent of marketing, production process sophistication, availability of latest technologies (indicators 7, 14, 15 and 20 in Table 1) since values are below the most frequent for the group (the mode). The main reason this group of indicators to be perceived as an obstacle to future development is the fact that they measure business sophistication, technological readiness and infrastructure, which are significant prerequisites for cluster development and enhancing national competitiveness. In Bulgaria, the state of indicators is also unfavourable.

Under the “state of cluster development” indicator, the countries have a score of between 3.0 and 3.9. The countries with the highest scores of between 3.9 and 3.7 are: Slovakia, the Czech Republic, Estonia and Poland, respectively. Bulgaria ranks fifth with 3.6. Slovenia, Latvia, Hungary, Lithuania, Romania and Croatia come next. The

unsatisfactory development of clusters in the latter countries is also demonstrated by their lagging behind relative to the 138 countries under the business environment indicators of significance for competitiveness, which were discussed above. The situation in Croatia, Romania and Hungary is similar.

The analysis of the results, which show small differences between the scores for the predominant part of the indicators for the whole group of countries studied, as well as values for Bulgaria close to the mean, gives us grounds to believe that the first research hypothesis, in the part concerning similarity, is confirmed.

Detailed analysis by determinants of national advantage (in a comparative context, both with the CEE, member states, and the 138 countries included in the Competitiveness Report 2016-2017), however, shows that the business environment for cluster development and enhancing competitiveness cannot be assessed as favourable. The conclusions which outline the favourable prerequisites and limitations for national competitiveness are the main arguments for this statement.

Factor conditions, represented by indicators supporting the building of sustainable competitive advantages in Bulgaria, are in the process of developing. The analyzed indicators lead to the conclusion that Bulgaria is behind compared to the other CEE EU member states, especially in comparison with the countries which have reached stage 3 of competitive development. The results for Bulgaria in the four directions – human capital, scientific institutions-industry collaboration, financial capital and infrastructure – are also not good enough.

Human capital in Bulgaria is not at the level, nor in the role of a competitiveness accelerator. One of the advantages provided by grouping enterprises in cluster organizations is the opportunity for additional staff training. On the other hand, as is the practice in Bulgaria, higher education institutions and scientific research institutes are members of clusters, which is a favorable factor for overcoming the serious problem of discrepancy between the competences of the workforce and the requirements of competitive economy. In this sense, clusters are a way to overcome the obstacles to national competitiveness mentioned. The unsatisfactory score of the quality of scientific research institutions explains why the score for innovations in the country is not so good. Participation in cluster formations gives rise to expectations for improvement of this field, which is of extreme importance for national competitiveness. On the indicators concerning ease of access to loans and infrastructure, we can summarize that there is improvement, but these fields are still acting as a limitation to the development of individual enterprises, cluster organizations, and, respectively, national competitiveness.

The factors related to the firm structure, strategy and rivalry are not sufficiently developed for enhancing national competitiveness and thus turn into a limitation. The analysis of the selected indicators leads to the conclusion that this observation is valid to a greater extent to the business environment and the conditions within it, and to a lesser extent – to the firms and their way of functioning. Positive development can be observed in the number of companies on the market (“extent of market dominance” indicator), companies’ capacity for innovations, company spending on R&D. Companies’ capacity for innovation, as a prerequisite to enhancing competitiveness, is a very important indication of the transition to the next stage of competitive development (innovation-driven).

The limitations found in this determinant predominate:

- nature and intensity of competition, and the type of created competitive advantages depend on different, both external and internal factors. The analysis of different aspects of competition (Intensity of local competition, Nature of competitive advantage) and the results of the comparative analysis do not provide grounds for claiming that the business environment is an incentive for quick and positive changes. The competitive advantage of Bulgarian companies on international markets (a score of 3.2 in the 2016-2017 Report and positions – 87 out of 138, and 9 within the group of compared CEE countries) is based on lower-rank factors, i.e. advantages with a lower degree of complexity and specialization, which does not guarantee the establishment of a sustainable competitive advantage. Price competition seems to be the main competitive strategy for a number of Bulgarian companies, and for some – the only possible one. The latter can also explain the stage of Bulgaria's competitive development – stage 2, characteristic of economies whose development depends on efficiency-driven factors. The insufficiently intensive competition in Bulgaria is also an obstacle to enhancing national competitiveness. In this sense, the emergence and, more importantly, the development of working clusters would compensate the unsatisfactory score under this factor;

- factors which could facilitate the enhancement of competitive advantage, such as staff training (Bulgaria ranks 102 among the 138 countries); marketing for product diversification (112 among the 138 countries); meeting customer requirements ("extent of customer orientation" – position 73 among the 138 countries) are at a very low level of development and a major concern for Bulgaria. Joint cluster initiatives in the field of training, marketing, product export could facilitate improving results in this area;

- results on the "production process sophistication" indicator inspire a positive attitude and expectations of changes towards technological renovation and development, as well as a change in the nature of the competitive advantage of Bulgarian companies on international markets. Bulgaria has improved its position in the past 5 years and has ranked 68th among the 13 countries in 2016-2017, but it is still behind in comparison with the CEE countries.

Demand conditions do not foster national competitiveness. This can be seen from Bulgaria's rankings among the 138 countries, as well as among the CEE, EU member states, in relation to the indicators measuring this determinant. Customer sophistication is an indicator that directly characterizes the "Demand Conditions" determinant and Bulgaria ranks 82nd among the 138 countries, which shows that customers are not very demanding. At this stage, customers can hardly be a driving force for substantial changes in the other determinants and hence – for national competitiveness.

The domestic market size index (an average of 3.6 for the past 5 years, which ranks Bulgaria 71st among the 138 countries and 7th in the Group) shows that the domestic market is not very significant. To some extent, the foreign market can be viewed as a prerequisite for enhancing competitiveness. The foreign market size index shows better results for Bulgaria – position 56 among the 138 and position 8 in the group. However, the fact is that to a large extent the goods with which Bulgaria participates on the international markets have low added value, which makes this advantage less significant. Both directions can be assessed as representing limitations.

The results of the analysis of indicators characterizing the Related Supporting Industries determinant show a low level of development compared to the other countries and act as limitations for national competitiveness. In relation to the availability of latest technologies, measured by the level of technological development indicator, Bulgaria (ranking 63 among all countries presented in the Global Competitiveness Index) lags behind the CEE countries as well, which determines its stage 2 of competitive development. The situation with local suppliers quantity and quality is similar. The only exception is the value chain breadth indicator, which represents to what extent companies cover separate stages or most of the stages in the value chain (Bulgaria ranks 4th in the studied group of CEE countries, with a score for this indicator, identical to that of Poland, Estonia, Latvia and Slovenia (3.8) is the only one. The comparison with CEE countries and the higher position Bulgaria holds should not be misinterpreted, since clusters in these countries are in their initial stages of development. In Bulgaria, in some of the clusters, the established structure, in terms of participants, representatives of different interrelated activities, is good, but applied research and analyses (Slavova, Bankova, & Ivanov, 2018) put forward arguments for many unused opportunities for interaction and collaboration between them.

Consequently, based on these conclusions, we can state that the first hypothesis, in the part “the business environment in Bulgaria fosters cluster development and enhancement of competitiveness”, is not confirmed.

The business environment in Bulgaria and cluster development

Cluster development in Bulgaria started with some delay compared to the other European countries. The starting point was the middle of 2000s. Two waves of the setting up of clusters can be recognized in Bulgaria. The first wave refers to the period 2004 – 2007 when the growth of clusters was largely enhanced at the beginning by a PHARE project that aimed at introducing an appropriate cluster approach and model. The second wave covers the period 2012-2015. The main reason for the second wave is funding from the Operational program “Development of the Competitiveness of the Bulgarian Economy” 2007-2013 and the Operational program “Innovations and Competitiveness” 2014-2020. After these financial interventions the result is more than 200 clusters³. The importance of industrial clusters for the regional development is proved on a global level. But it is not so obvious in Bulgaria, because of the state of clusters. Only small number of them are functioning clusters and the predominant number are latent clusters (Slavova, Bankova, & Ivanov, 2018). Most of the functioning clusters are still at the initial stage of development, even those that were established during the first wave.

The indicator used to measure cluster development is “state of cluster development” (Global Competitiveness Report of the World Economic Forum). The indicator refers to the distribution, extent of development and depth of the clusters. Among the selected countries, Bulgaria ranks 5th under the state and development of clusters indicator. Among the 138 economies studied, Bulgaria ranks 78th. The countries with the highest scores among those studied here are: Slovakia, the Czech Republic, Estonia and Poland. They all rank below the top 50 in the WEF ratings. The average indicator for Bulgaria in the past five years is 3.3, and in 2016 it was 3.6.

³ Bulgarian Association of Business Clusters, http://www.abclusters.org/about_us.html

Table 2. Results of correlation analysis and correlation matrix

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1 State of cluster development	1																									
2 Quality of the education system	-0.53	1																								
3 Country capacity to retain talent	0.90	-0.76	1																							
4 Pay and productivity	0.07	-0.19	-0.05	1																						
5 University-industry collaboration in R&D	0.75	-0.13	0.73	-0.35	1																					
6 Quality of scientific research institutions	0.67	-0.07	0.61	-0.66	0.87	1																				
7 Ease of access to loans	0.89	-0.23	0.79	-0.07	0.94	0.77	1																			
8 Quality of overall infrastructure	0.25	0.27	0.27	-0.85	0.75	0.87	0.52	1																		
9 Intensity of local competition	-0.67	0.82	-0.65	-0.38	-0.04	-0.08	-0.28	0.40	1																	
10 Nature of competitive advantage	0.94	-0.70	0.89	0.35	0.56	0.38	0.76	-0.06	-0.80	1																
11 Extent of market dominance	0.76	-0.34	0.82	-0.51	0.94	0.92	0.86	0.76	-0.19	0.57	1															
12 Capacity for innovation	0.56	-0.16	0.63	-0.75	0.86	0.95	0.69	0.90	0.01	0.30	0.95	1														
13 Company spending on R&D	0.72	-0.32	0.79	-0.59	0.91	0.94	0.80	0.80	-0.18	0.51	0.99	0.97	1													
14 Extent of staff training	0.49	-0.37	0.70	-0.69	0.78	0.81	0.59	0.78	-0.04	0.32	0.92	0.94	0.94	1												
15 Extent of marketing	0.00	0.51	-0.01	-0.83	0.59	0.71	0.34	0.96	0.64	-0.31	0.56	0.74	0.59	0.61	1											
16 Production process sophistication	0.27	0.07	0.41	-0.76	0.80	0.79	0.56	0.94	0.38	0.03	0.82	0.90	0.83	0.89	0.87	1										
17 Degree of customer orientation	-0.87	0.82	-0.90	0.00	-0.47	-0.52	-0.59	-0.07	0.88	-0.87	-0.64	-0.47	-0.63	-0.50	0.22	-0.11	1									
18 Time required to start a business	0.21	0.05	0.34	-0.93	0.67	0.83	0.41	0.95	0.30	-0.06	0.77	0.93	0.82	0.89	0.88	0.94	-0.17	1								
19 Number of procedures required to start a business	-0.20	0.22	0.03	-0.87	0.41	0.49	0.08	0.82	0.62	-0.41	0.48	0.68	0.53	0.72	0.84	0.87	0.22	0.88	1							
20 Value chain breadth	0.60	-0.45	0.78	-0.66	0.79	0.86	0.64	0.74	-0.19	0.43	0.94	0.95	0.96	0.98	0.53	0.82	-0.63	0.85	0.61	1						
21 Availability of latest technologies	0.75	-0.37	0.83	-0.53	0.92	0.92	0.82	0.75	-0.22	0.57	1.00	0.95	1.00	0.93	0.54	0.81	-0.66	0.79	0.48	0.96	1					
22 Local supplier quantity	0.63	0.00	0.53	0.22	0.79	0.42	0.86	0.32	0.00	0.59	0.57	0.37	0.48	0.31	0.23	0.42	-0.21	0.13	0.00	0.29	0.51	1				
23 Local supplier quality	0.51	0.22	0.43	-0.58	0.92	0.90	0.79	0.92	0.26	0.23	0.84	0.87	0.84	0.72	0.84	0.87	-0.19	0.80	0.38	0.70	0.81	0.65	1			
24 Buyer sophistication	0.72	-0.80	0.91	-0.34	0.60	0.64	0.56	0.36	-0.59	0.67	0.81	0.72	0.82	0.82	0.09	0.48	-0.88	0.53	0.24	0.89	0.84	0.19	0.37	1		
25 Domestic market size index	-0.10	-0.60	0.03	0.72	-0.61	-0.74	-0.43	-0.92	-0.57	0.23	-0.53	-0.69	-0.56	-0.48	-0.96	-0.76	-0.19	-0.77	-0.67	-0.44	-0.51	-0.32	-0.88	0.00	1	
26 Foreign market size index	-0.25	0.80	-0.40	-0.71	0.25	0.47	0.05	0.75	0.72	-0.56	0.18	0.42	0.23	0.20	0.88	0.53	0.47	0.61	0.14	0.16	0.00	0.61	-0.30	-0.92	1	

Source: Computations (based on data from WEF, Global Competitiveness Index (2012/13 – 2016/17))

Correlation analysis⁴ was applied in order to show whether there are arguments for confirming or rejecting the second research hypothesis. The data used was data for Bulgaria over a five-year period (2012-2016) from the Global Competitiveness Reports of the World Economic Forum. Coefficients of variance, which show the connection between “state of cluster development” and the other analysed indicators, were computed. A t-test for significance of the correlation coefficients was performed, and only the indicators with significant coefficients of correlation were analysed and presented here. The results, ordered by strength and direction of the connection, are shown in the correlation matrix below.

Factors which facilitate sustainable competitive advantages – technological development, attitude of the companies to the customers (extent of customer orientation), retaining talent in the country, customer sophistication, company spending on R&D, university-industry collaboration in the field of the study, extent of market dominance, ease of access to loans, nature of the competitive advantage – show a high and very high positive relationship with cluster development. The connection with related and supporting indicators is significant and positive – interaction with scientific research institutes, suppliers, including their qualitative characteristics. For the three indicators, the results for the past five years for Bulgaria are not satisfactory. An exception to this is the assessment of the quality of local suppliers, where the country ranks 46th in the latest report, which is its highest position so far. The state of cluster development and intensity of local competition show a significant but inverse relationship. In Bulgaria, companies even though being a member of a cluster, they do not fully realize their advantages in terms of competition and joint efforts. The reason is that clusters in Bulgaria are still in a process of building efficient internal interactions between their members (Slavova, Bankova, & Ivanov, 2018; Bankova, 2015:114-123).

To conclude, the correlation coefficients of more than two-thirds of the indicators (19 out of 29) show a significant high and very high strength of the relationship, which confirms the second research hypothesis for existence of interaction between the business environment and state of cluster development in Bulgaria.

Cluster development in Bulgaria and the business environment as a prerequisite for enhancing national competitiveness

The business environment and cluster development in given economy have a defining role for the development, maintenance and enhancement of national competitiveness and this has been proven repeatedly in theory and in practice. The importance of their interaction stems from the fact that clusters facilitate the construction and development of a competitive business environment, on the one hand, and that dynamic environment acts a driver for cluster growth and innovations, on the other (Solvell, Lindqvist, & Ketels, 2003).

The analysis using the four determinants under the Diamond Model (factor conditions; firm strategy, structure and rivalry; demand conditions, related supporting industries) showed a predominance of the limitations and obstacles for cluster development and enhancement of national competitiveness. Under the indicators, which have a high degree of correlation dependence (technological development; company

⁴ Excel 2016 was used: Data analysis, t-Test: Two-Sample Assuming Equal Variances.

spending on R&D; university-industry collaboration in the field of the study; customer sophistication, etc.) and have been established as decisive for enhancing competitiveness, Bulgaria is significantly behind not only relative to the CEE member states, but also in comparison with the 138 countries included in the Global Competitiveness Report 2016-2017.

On the other hand, cluster development is in its initial stage and regardless of the high number of registered clusters in Bulgaria, the number of functioning clusters is small and latent clusters predominate (Bankova, 2015:114-123). In addition, the insufficiently good state of cluster development (relative to the 138 countries, Global Competitiveness Report 2016-2017) gives us grounds to believe that the clusters do not act as a driver for the development of a competitive business environment.

In conclusion, we can summarize that the development of the business environment and cluster development in Bulgaria, as well as their interaction at this stage, are not a prerequisite for enhancing national competitiveness. Consequently, hypothesis 3, which is conclusive for the overall study, is not confirmed.

CONCLUSION

The survey was conducted on countries that meet the following criteria: (1) Central and Eastern European countries; (2) former socialist countries; (3) EU Member States. Ten countries meet these criteria: Hungary, the Czech Republic, Slovakia, Romania, Slovenia, Croatia, Poland, Estonia, Lithuania and Latvia. The reason for the choice is that clusters in Bulgaria as well as in the mentioned countries appear at a later stage. For most of the analyzed indicators, the results of Bulgaria are similar to those in other surveyed countries. The results show the dominance of constraints and obstacles to improving national competitiveness. The state of the business environment, the level of cluster development and their interaction are not very favorable for more intensive competitive development of the Bulgarian economy. CEE countries differ the most in the time and number of procedures for starting a business, the index of the size of the domestic market, the quality of the education system, the country's ability to retain talent. In Bulgaria, although companies are cluster members, they do not fully realize their competitive advantages and joint efforts. The reason is that clusters in Bulgaria are still in the process of building effective internal interactions between their members. In developed economies, an innovative "push and pull" model is applied, a way that means - technological pressure and market pull (Cariannis, Wang, 2012: 281). In order to follow this innovation-driven model, Bulgaria needs improvements both in the business environment and in the internal environment of clusters and companies. More attention is needed to facilitate and intensify the processes for generating and putting knowledge and innovation into practice, as well as to support further factor sophistication. For further improvement in Bulgaria, deeper research is needed to show which policies the countries have achieved their rankings, as well as what are the good and bad experiences, in order for Bulgarian clusters to be one of the pillars of national competitiveness.

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CROBEX AND INDUSTRY PERFORMANCE IN THE CASE OF CROATIA: EVIDENCE FROM WAVELET COHERENCE

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Abstract: *Determinants of the stock market index movement have always been of interest to scholars and practitioners. Various time series techniques have already been applied to determine the relationship between the stock market prices and macroeconomic variables. Many of these techniques are unable to reveal the frequency and time dependent relationship often leading to incorrect specification. Furthermore, results may differ depending on the level of the economic development. This paper is using the Wavelet coherence as a rather novel approach compensating for some limitations of the conventional approach bringing further insight into the stock market price movement of the Croatian capital market. Wavelet transform enables observation of the connection between the CROBEX and the industry performance across time and frequency domain. This relationship is tested using monthly data for CROBEX and industrial production index volume in the period from January 1998 to September 2019. Significant positive relationship was confirmed in the period from 1998 to 2015 identifying CROBEX as the leading variable.*

Keywords: *correlation; wavelet coherence; stock market index; industry performance; Croatia*

JEL Classification: *E32, G14, F41.*

INTRODUCTION

Croatia is one of the post-transition economies that recently joined the European Union. In the last few decades Croatia has experienced transformation of the economy emphasizing promotion of the free market structures. This transformation was accompanied by privatization and development of the financial system. With rising efficiency of the financial intermediaries the stock market has experienced significant growth and relationship between the stock market and the fundamental economic variables has become an important issue for scholars and practitioners.

According to arbitrage pricing theory (APT) stock market prices movement could be explained by various macroeconomic variables (Ross, 1976). Some of the main macroeconomic indicators are industry performance, foreign direct investment (FDI), trade balance, exchange rate, interest rate and consumer prices (CPI) (Chang, Meo, Syed, & Abro, 2019). Nevertheless the relationship between the market index and the macroeconomic indicators is not necessarily straightforward. Even though stock markets are dependent on the microeconomics factors, general economic perspective and expectations (Durovic & Mutibaric, 2011) stock markets sometimes react without “clearly identifiable economic factors” (Peiro, 2016). Consequently to publicly available information capital markets may react even more quickly than macroeconomic variables (Benaković & Posedel, 2010). Therefore financial variables may be used to predict the level of the economic activity (Kim & In, 2003). Furthermore it is important to emphasize that Croatia is a small and open economy where the market sentiment may also be significantly influenced by the global trends therefore sentiment preceding the change of the economic activity. Nevertheless consequently to examining the connection between the industry performance and the capital markets depending on the methodology, data sample, level of the economic development, depth of the financial market and the prevailing monetary policy there are many interpretation of their causative relationship (Tomić & Sesar, 2015). Furthermore, previous studies deal primarily with developed capital markets and this relationship may not share the same properties in emerging countries. Therefore using a novel Wavelet coherence approach this paper aims to bring further insight regarding this relationship of the stock market prices and the industrial performance in Croatia.

Remaining of the paper is organized in five parts. Second part of the paper offers past and recent development of literature. Third part of the paper describes selected data and applied methods. Fourth part of the paper shows results and offers short discussion. Finally, the last part of the paper summarizes results and considers further recommendations for investors and policy makers.

LITERATURE OVERVIEW

In the case of the United States using correlation and scatter plots in the period from 1995 to 2014 industrial production index, GDP, unemployment rate and the long-term interest rates were found to have a significant relationship with the stock market (S&P500, Dow Jones), while the CPI was not significant (Jareño & Negrut, 2016).

Spectral analysis and wavelet coherence confirmed the relationship between financial variables and industrial production in the United States in the period from 1959 to 2001. According to the spectral analysis there is a long-term connection while the lead-lag relationship was conditioned by the business cycle. Wavelet coherence analysis also confirmed the co-movement of the financial variables and the industrial production whose relationship is time and frequency dependent (Kim & In, 2003).

Maximum overlap discrete wavelet transform (MODWT) was used to investigate the relationship between industry performance and the US DJIA stock price data. In the period from 1961 to 2006 results indicated stock market returns leading the level of economic activity and that the relationship was significant only on the lowest frequencies (highest scales) (Gallegati, 2008).

The connection between the industry performances, CPI, oil price and the stock market prices was examined in the case of Greece in the period from 1996 to 2008. Cointegration and VECM approach was employed to examine the original data and VAR was employed to explore the cyclical nature of the variables. Long-term connection was confirmed for oil prices and the CPI. Results revealed negative influence of the oil prices to the stock market and CPI. No effect was found between the oil prices and industry performance and CPI. Finally, industrial performance and the stock market prices were also independent (Filis, 2010).

The relationship of industrial production and the stock market indexes was observed for selected European countries (Greece, Italy Portugal, Spain, Austria, Belgium, Finland, Germany) in the period from 2004 to 2013. Results confirmed asymmetric and symmetric adjustment to long-term equilibrium in the South (Greece, Italy Portugal, Spain) and North (Austria, Belgium, Finland, Germany) respectively. According to Granger causality, direction of the relationship was from the industrial production to the stock market index (Tsagkanos & Siriopoulos, 2015).

Dependence of the macroeconomic variables and the stock market returns was tested in United Kingdom, Germany and France. In the period from 1969 to 2013 results revealed that both interest rates and industry performance explained the half of the annual movement in the stock market prices. Additionally weight of those two has shifted toward industry performance (Peiro, 2016).

The relationships among several economic indicators (industrial production, trade balance, foreign reserves, exchange rate, fiscal deficit, inflation, money supply, call money rate, oil price) and the Indian stock market prices (BSE 500) were examined in the period from 2006 to 2015. According to Granger causality selected variables were not significant (Gurloveleen & Bhatia, 2015). Adjusting this approach with conditional frequency domain unidirectional long-term relationship was confirmed in the period from 1993 to 2011 therefore revealing the stock market price as indicator of industrial production growth (Tiwari, Mutascu, Albulescu, & Kyophilavong, Frequency domain causality analysis of stock market and economic activity in India, 2015).

Using NARDL approach Pakistan stock market was tested in the period from 1997 to 2018. Results confirmed the long term positive influence of industry performance and consumer prices while negative influence of trade balance, exchange rate and interest rate. Nevertheless in the post crisis period from 2008 to 2018 only consumer prices were significant (Chang, Meo, Syed, & Abro, 2019).

Similar approach was used for test the asymmetric effects of the industrial production, real effective exchange rate and the money supply for Turkish stock market prices in the period from 1994 to 2017. Using the non-linear autoregressive distributed lag (NARDL) with special emphasis on post-crisis period results confirmed the hypothesized nature of the relationship with rising asymmetries in the post-crisis period emphasizing negative influence of the restrictive monetary policy (Tiryaki, Ceylan, & Erdoğan, 2019).

There are several studies exploring the Croatian stock market. One of the studies examined the relationship of 14 stock prices and industry performance, interest rates, inflation, market index as well as the oil prices. In the period from 2004 to 2009 selected stocks were mostly influenced by the CROBEX index and positive relationship was

confirmed for industry performance, interest rates and the oil prices while inflation was found to have a negative influence (Benaković & Posedel, 2010).

Croatian stock market index was further tested for selected macroeconomic variables, German market index and Euro area government bond yield in the period 1997-2010. Real GDP, M1/GDP ratio, German market index, Euro area government bond yield were found to have a positive influence while public deficit to GDP, domestic interest rate, rising exchange rate and inflation were found to have a negative influence (Hsing, 2011).

Using the CRR (Chen-Rolls-Ross) model for capital asset pricing market index in Croatia was found to be the most important explanatory factor. Nevertheless, liquidity, employment and oil price had marginal explanatory power. Industrial production was not significant (Dolinar, Orsag, & Sudar, 2014).

One of the recent studies examined the relationship among industrial performance, exchange rate and the stock market prices in Croatia in the period 1998-2014. According to Johansen method analysis revealed no long-term relationship between the dynamics of the selected variables. As a part of the vector auto-regression model (VAR) using Granger causality testing results indicated direction of influence from the exchange rate to the industrial performance and direction of influence from industry performance to CROBEX. This was inconsistent with theoretical consideration CROBEX being the leading variable for the industry performance as a proxy of the aggregate economic activity (Tomić & Sesar, 2015). Using similar methodology another study tested the relationship between the stock market returns in the hospitality industry and the macroeconomic variables (industry performance, CPI (consumer price index), exchange rate and the number of tourist arrivals) in the period 2008-2018. Granger causality confirmed the direction of influence from the consumer price index to hospitality stock market returns (Bogdan, 2019).

Depending on selected methodological approach and sample selection relationship between the stock market index and industrial production is not straightforward. Some papers found no significant relationship while others suggesting different causative relationship. Therefore, using a wavelet coherence approach this paper adds to the body of literature examining this relationship.

DATA AND METHODOLOGY

Stock market index data is available on the official site of the Zagreb stock exchange on daily basis from January 1998. Zagreb stock exchange was firstly established in 1907 and later reestablished in 1991 becoming the central capital market of Croatia and during the last three decades experienced significant trading growth.

Monthly average of the CROBEX is calculated according to the following equation (1):

$$CROBEX^m = \frac{\sum_1^n CROBEX^d}{n} \quad (1)$$

Monthly log return of the CROBEX is calculated as the change in the average monthly value according to the following equation (2):

$$R^m(t) = \log(CROBEX_t^m) - \log(CROBEX_{t-1}^m) \quad (2)$$

Development of the monthly CROBEX and CROBEX log returns for the selected period from January 1998 to November 2019 are given in Table 1 and Appendix 1.

Table 1. Descriptive statistics for monthly CROBEX and CROBEX log returns

	CROBEX	CROBEX log returns
Min.	523,9	-0.2661
1st Qu.	1160,2	-0.0224
Median	1771,4	0.0009
Mean	1810,3	0.0025
3rd Qu.	1961,8	0.0319
Max.	5263,1	0.2017

Source: own estimates

In the period 1998-2019 average monthly CROBEX value ranged from 523,9 to 5263,1 while the average monthly return oscillated from -0,2661 to 0,2017. The period from 2004 to 2007 was characterized by the rising optimism increasing the number of market investors' consequently in October reaching the historical high of 5263,1 points. Most significant rise of the monthly CROBEX value happened in April 2007 equal to 568,7 points. Nevertheless crash happened in October 2007 when the monthly CROBEX value fell -761,2 points. The bottom low of the CROBEX value was reached in March 2009. After this point volatility of the CROBEX value was soothed. Average monthly log return for the observed period was 0,0025. The highest positive monthly return 0,2017 was marked in December 1999 and the highest negative monthly return -0,2661 in October 2008.

Since the gross domestic product (GDP) data is published quarterly industrial production volume index is the most accurate monthly indicator of the economic activity. Seasonally adjusted monthly data of industrial production volume index in the period from 1998-2019 was retrieved from the official site of the Croatian Central Bureau of statistics. Monthly industry growth is calculated according to the following equation (3):

$$IG^m(t) = \log(IP_t^m) - \log(IP_{t-1}^m) \quad (3)$$

Development of the industrial performance for this period is observable in Table 2 and Appendix 2.

Table 2. Descriptive statistics for seasonally adjusted monthly industrial production volume index and industry growth

	DIP	DIP growth
Min.	80	-0.0939
1st Qu.	96	-0.0136
Median	102	0.0000
Mean	101,1	0.0007
3rd Qu.	106,9	0.0142
Max.	122,1	0.0836

Source: own estimates

In the period 1998-2019 monthly industrial production volume index ranged from 80 to 122,1 while the monthly industry growth returns oscillated from -0,0939 to 0,0136. Following the basic description of data research starts with the most conventional approach. Based on described data first step was to calculate the Pearson correlation coefficient for the CROBEX and industrial performance and their relationship is examined by the linear regression model. In order to avoid the limitations of the conventional approach and to derive insights into time and frequency domain this paper further applies adapted Wavelet methodology developed for European stock markets (Tiwari, Mutascu, & Albulescu, 2016). In order to examine the relationship of the observed variables, necessary estimates were calculated using Morlet wavelet which is represented by the following equation (4):

$$\psi^M(t) = \pi^{-\frac{1}{4}} e^{i\omega_0 t} e^{-\frac{1}{2}t^2} \quad (4)$$

while ω_0 represents the central frequency representing the number of oscillations and t represent the time enabling time reliant amplitude and different frequency phasing. The continuous wavelet transform is represented by the following equation (5):

$$W_x(\tau, s) = \frac{1}{\sqrt{s}} \int_{-\infty}^{\infty} x(t) \overline{\psi\left(\frac{t-\tau}{s}\right)} dt \quad (5)$$

while $x(t)$ represents selected time series while s represent scale and τ location determining the position of the wavelet. According to the wavelet transform selected time series $x(t)$ is represented in terms of wavelets. Furthermore wavelets enable the examination of direction, size and significance of the local relationship between the two time series depending on time frame and period. To examine direction, size and significance of the local correlation between stock market and industry performance as the two observed time series, cross wavelet transformation and cross wavelet power is further determined. The cross wavelet transformation of the observed two time series $x(t)$ and $y(t)$ is represented by the following equation (6):

$$W_{xy}(\tau, s) = W_x(\tau, s) \overline{W_y(\tau, s)} \quad (6)$$

while $W_x(\tau, s)$ represents continuous wavelet transformation of the observed time series $x(t)$ and $\overline{W_y(\tau, s)}$ represent complex conjugate continuous wavelet transform of the observed time series $y(t)$. The power of the cross wavelet is estimated by $|W_{xy}(\tau, s)|$. Finally, the squared wavelet coherence coefficient is represented by the equation (7):

$$R^2(\tau, s) = \frac{|S(s^{-1}W_{xy}(\tau, s))|^2}{S(s^{-1}|W_x(\tau, s)|^2)S(s^{-1}|W_y(\tau, s)|^2)} \quad (7)$$

while S being the smoothing operator. Squared wavelet coherence coefficient is similar to Pearson falling into zero-one interval. Additionally, wavelet coherence analysis enables phase differences between observed time series. Wavelet coherence phase difference calculation is given by the equation (8):

$$\varphi(\tau, s) = \tan^{-1} \left(\frac{\Im(W_{xy}(\tau, s))}{\Re(W_{xy}(\tau, s))} \right) \quad (8)$$

where $\Im$ represent the imaginary and $\Re$ represent the real part of the cross wavelet transform given by the equation (8). Phase difference is represented by arrows. A zero phase difference points out that the observed time series are positively correlated. Direction of the wavelet arrows render which of the variables is the leading and which of the variables is lagging as well as the sign of the correlation. If the arrow is oriented right and up time series are positively correlated and the first variable is to be leading by the right angle. If the arrow is oriented right and down time series are positively correlated and the second variable is the leading by the right angle. If the arrow is oriented left and down times series are negatively correlated and the second variable is leading by the right angle. Finally, if the arrow is oriented left and up times series are negatively correlated and the first variable is leading by right angle. Furthermore, the higher scale (lower frequency) represents the long-term relationship and the lower scale (higher frequency) represents the short-term relationship.

RESULTS AND DISCUSSION

Results of the conventional approach are given in Table 3 and Table 4. According to the Pearson correlation coefficients, CROBEX was significantly positively correlated with industrial production volume index $r=0,81$ ($p=0,00$). Linear regression relationship between the CROBEX and the industrial production volume index was representative ($F=504$; $p=0,00$) explaining 66,06% of the variations. Nevertheless, Pearson correlation coefficients was not significant for CROBEX returns and industry growth $r=-0,02$ ($p=0,70$) and linear model representation was not confirmed ($F=0,1425$; $p=0,706$).

Table 3. Pearson correlation coefficients results

Variable relationships	t-value	df	p-value	95% CI	Pearson
CROBEX & industrial production	22,45	259	0,00	0,76-0,85	0,81
CROBEX returns & industry growth	-0,37	258	0,70	0,14-0,09	-0,02

Source: own calculation

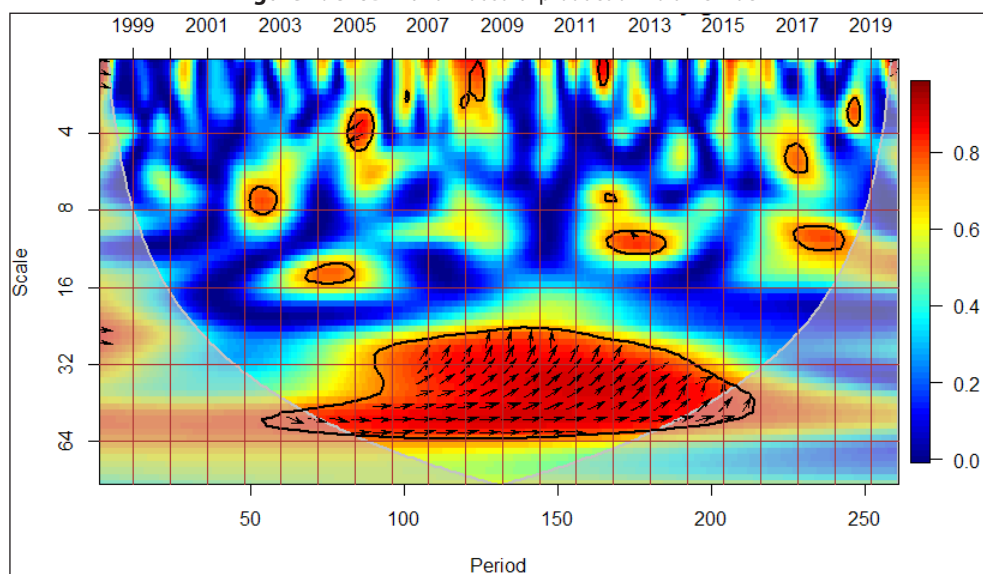
Table 4. Linear regression models results

Dependent variable	Industrial production		Industry growth	
Coefficients	Intercept	CROBEX	Intercept	CROBEX returns
Estimate	8,61E+04	8,27E+00	0.000809	-0.010235
Std. Error	7,46E+02	3,69E-01	0.0016695	0.0271167
t value	115,46	22,45	0,485	-0,377
Pr(> t)	<2e-16	<2e-16	0,628	0.706
R-squared	0,6606		0,0005519	
F-statistics	504		0,1425	
p-value	<2e-16		0,7061	

Source: own calculation

Consequently to limitations present in the conventional approach specification of the linear regression model may be incorrect. Wavelet approach avoiding these limitations provides frequency and time domain observation distinguishing the long and the short term as well as the leading and the lagging variables. Relationship between the CROBEX and the industrial production index by the Wavelet approach is represented in Figure 1.

Figure 1. CROBEX and industrial production volume index

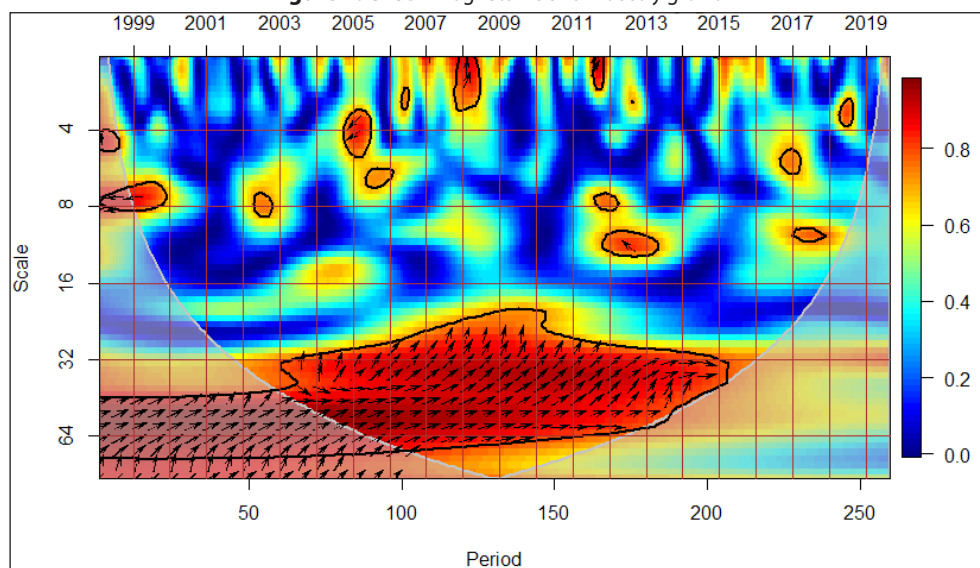


Source: own calculation

The co-movement between the CROBEX and industrial production was significant and positive in the long-run from the second half of 2002 to the end of 2016. This co-movement was present even in the crisis period from 2004 to 2009. Arrows are pointing to the right representing positive correlation. It is important to emphasize there was no leading variable on higher scales (arrows pointing horizontally right) and with lowering the scale arrows are pointing upwards therefore CROBEX becoming the leading variable. In the period from 1998 to 2003 and from 2016 to 2019 this co-movement was not significant. In summary, the stock market prices and industry production had a significant co-movement relationship for 13 years which is more than half of the observed period. This relationship was not affected by the last global financial crisis. In order to retrieve more insights about this relationship same analytics were applied for CROBEX log returns and the industrial growth.

Relationship between the CROBEX log returns and the industrial growth by the Wavelet approach is represented in Figure 2. The result is even more important for the investors since it represents the relationship between the actual returns on the Croatian capital market and the industry growth.

Figure 2. CROBEX log returns and industry growth



Source: own calculation

According to the Wavelet representation, co-movement between the CROBEX returns and the industry growth is significant and positive in the long-term for even longer periods of time. This relationship cease to exist after 2015. This relationship confirms the previous result and the CROBEX log returns are revealed as the leading variable for the entire period of the relationship. Therefore results reveal significant co-movement of the CROBEX and industrial performance in the long run for most of the observed period regardless the volatility. Furthermore CROBEX is identified as the leading variable implying that the capital market sentiment is more sensitive to

publicly available information and that the industrial production is lagging the capital market sentiment. CROBEX incorporates investor expectations about the future including domestic and global economic activity. This relationship was confirmed in another study observing seven emerging stock markets (Brazil, China, India, Indonesia, Mexico, Russia and Turkey) emphasizing regional influence as more prominent than intercontinental (Bilgehan, 2018). Therefore it may be expected that some Croatian stock market sentiment is transferred from the capital markets of other countries.

CONCLUSION

This paper brings several insights into relationship among CROBEX and industry performance. Results of the research confirmed the significant long-term co-movement of the capital market index and industrial production in the period from 2002 to 2016. This relationship was even more emphasized for the stock market returns and the industry growth in the period from 1998 to 2015. In the case of Croatia CROBEX was found to be the leading variable for the industry performance. Although significant relationship was present during time of crisis the co-movement was not confirmed in the period from 2015 to 2019. Disentanglement of the underlying factors causing the change in the relationship of the CROBEX and industry performance after 2015 should be further examined. Results of this research add to the body of knowledge regarding the relationship of the macroeconomic variables and the stock market revealing important implications for investors and policy makers. Investors may benefit from the knowledge that the domestic industry performance may not be suitable for deriving the short term trading strategies in Croatia and that they should consider other more prominent indicators. Furthermore, policy makers may benefit from the knowledge that the stock market index movement may be useful in creating more efficient macroeconomic policies countering the economic cycles.

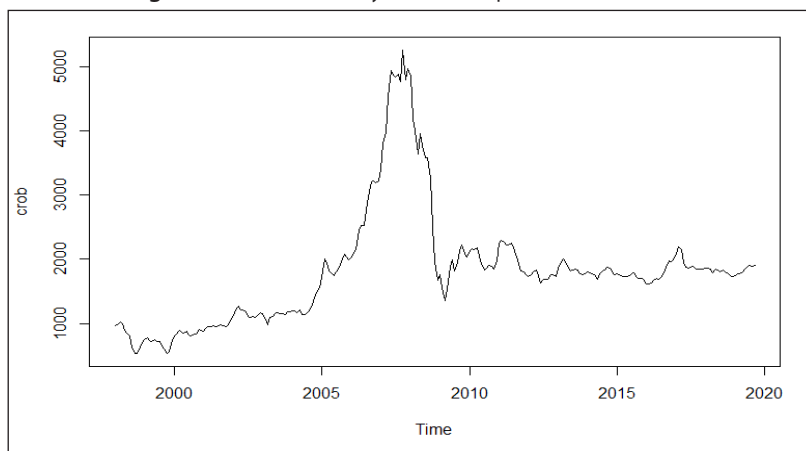
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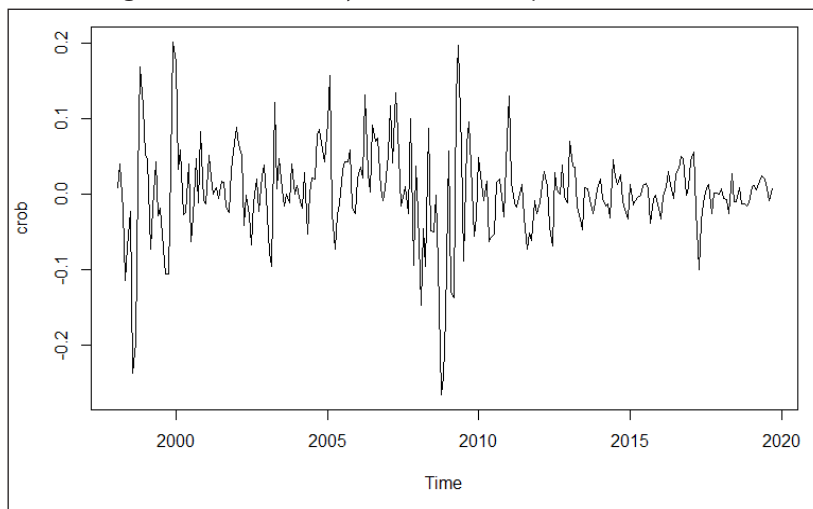
APPENDIX

Figure 3. CROBEX monthly value in the period 1/1998-9/2019



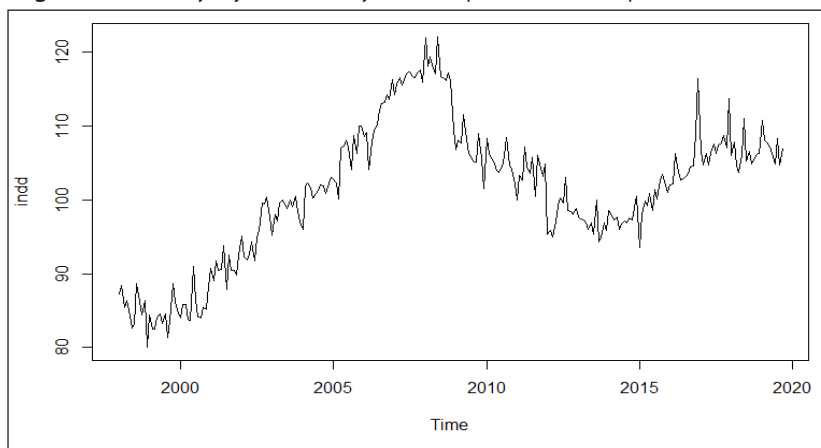
Source: own calculation

Figure 4. CROBEX monthly return value in the period 1/1998-9/2019

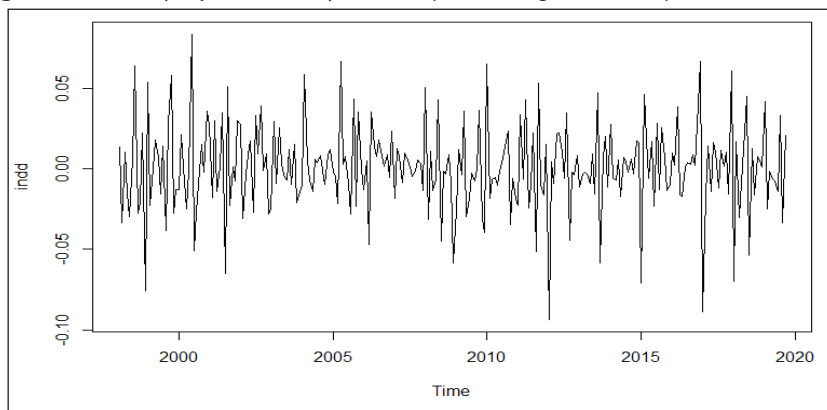


Source: own calculation

Figure 5. Seasonally adjusted monthly industrial production in the period 1/1998-9/2019



Source: own calculation

Figure 6. Seasonally adjusted monthly industrial production growth in the period 1/1998-9/2019

Source: own calculation



STATISTIČKO MODELIRANJE PROFILA POROŠAČA U FUNKCIJI ADAPTACIJE MARKETING STRATEGIJE U USLOVIMA PANDEMIJE COVID-19

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Sažetak: Marketing aktivnosti usmjeravaju poslovnu djelatnost i proizvodni portfolio poslovnih sistema zahtijevima potrošača, međutim postoje situacije u kojima ove aktivnosti kreiraju i stimulišu određene potrebe i zahtjeve. Kreiranje tržišta predstavlja kompleksnu djelatnost koja tangira veliki broj disciplina i sinergetskim djelovanjem kreira zadovoljstvo proizvodom i/ili uslugom što u uslovima pandemije predstavlja poseban izazov kreatorima proizvodnog portfolija, a posebno kanalima distribucije. Distribucija proizvoda i/ili usluga predstavlja ključni faktor poslovnog uspjeha u uslovima socijalne distance i nedovoljno razvijene tehničko – tehnološke podrške prelasku na virtuelnu sferu poslovanja i komunikacije. Korisna baza poslovne aktivnosti obuhvata adekvatno modeliranje profila potrošača i korisnika proizvoda i/ili usluga kako bi se marketinška strategija prilagodila njima što u konačnici obezbjeđuje smjernice tržišnom pozicioniranju kao preduslovom poslovne efikasnosti. Kreiranje potrošačkih profila zahtijeva modelsku analizu navika, sklonosti, talenata, ličnih i socijalno – psiholoških karakteristika koji omogućavaju komponovanje similarnih grupa, a time i adaptaciju marketinških strategija usklađenu sa modeliranim profilima potrošača. Empirijska utemeljenost predloženih rješenja omogućava visok stepen povjerenja u modelirane informacije, a time i pouzdanost u njihovu objektivizaciju čime se omogućava fleksibilnost poslovanja uslovljena vanjskim podražajima, kao što je pandemija COVID-19, ali se adaptacijom može koristiti u drugim uslovima privređivanja.

Ključne riječi: profil potrošača; stohastičko modeliranje; marketing strategija; empirijska utemeljenost; poslovna efikasnost.

JEL klasifikacija: C1, M3, M11, M31.

UVODNA RAZMATRANJA

Cilj istraživanja rada jeste uspostaviti korelaciju i doći do odgovora kako uklopiti profile potrošača i njihovu kupovinu u uslovima pandemije. Kako će potrošači kupovati zavisi od mnogobrojnih faktora, što internih, što eksternih koji važe i u prirodnim uslovima. S obzirom na uslove u kojima se trenutno nalazimo, potrebno je vidjeti kako se u današnjoj pandemiji ponašaju potrošači prilikom kupovine.

Utvrđivanje same kupovine, formiranje grupe faktora koji utiču na potrošače pomaže nam da utvrdimo i formiramo nove marketing strategije. Novi pristupi marketingu podrazumijevaju promjene sa teorijske strane a zatim i praktične, tržišno orijentisane strane.

Grupisanje faktora uticaja na potrošače sužava analize i daje nam bolje uvide prilikom pristupanja tržištu. Reakcija potrošača na potrošnju uslovljava i profilisanje istih potrošača i njihov pristup samoj kupovini.

Marketing u uslovima pandemije ima izazovne zadatke da kroz kreaciju, ideje i gerila pristup marketingu omogući funkcionisanje poslovnih sistema i kompanija.

Na potrošače imaju uticaja interni i eksterni faktori na tržištu a kada posmatramo sam marketing u doba pandemije, možemo napraviti korelaciju i komparaciju faktora uticaja.

Kada je u pitanju marketing, kompanije i potrošači, možemo vidjeti generalno grupisanje faktora različite prirode: ekonomske, pravne, medicinske, psihološke; od kojih psihološki zalaze u područje internih faktora uticaja na pojedinca u društvu. Nažalost, svjedoci smo i izvrtanju internih, psiholoških faktora i njihov prelazak u zonu tamne psihologije, kako ju često nazivaju stručnjaci ove oblasti.

Kroz rad ćemo pokušati grupisati faktore koji pokazuju ponašanje potrošača u današnjim uslovima pandemije i to na ovom geografskom području, na teritoriji Bosne i Hercegovine.

PRETHODNA ISTRAŽIVANJA

Ličnost po sebi je kompleksan sistem i ima posebnu strukturu ličnosti. Faktori koji utiču na ličnost su biloški, psihološki, socijalni i sociološki (Milić, 2009). Ličnosti nas prve interesuju kako bismo uopšte razumjeli potrošače i profile potrošača. I u uslovima pandemije se posebno bavimo ovim internim faktorima, tj. psihološkim faktorima uticaja na ljude kao ličnosti i njihovo ponašanje, odnosno njihove reakcije u vanrednim okolnostima.

Važno je da poznajemo sebe i svoje sisteme vrijednosti, kao i strukturu nas samih kao pojedinaca kako bismo mogli razumjeti ponašanje sopstveno prilikom stvarne kupovine na tržištu. S toga, načini vlastite spoznaje samih sebe kao i razumijevanje drugih ljudi su uvijek važni, a posebno u vanrednim okolnostima. Um je taj koji stvara svijet oko nas (Elliot Aronson, 2005).

Strategija marketinga i uopšte implementacija marketing miksa se posebno primjenjuje i posmatramo koncept 4P kroz sve različite situacije (Segić, 2011).

Kada govorimo o faktorima uticaja na odluke potrošača o kupovini, možemo posmatrati sve eksterne i interne faktore kroz komparativnu analizu prethodnih faktora gdje su posebno izdvojeni i izvedeni faktori na osnovu uporedne analize. Ono što je potrebno izdvojiti kada su u pitanju najvažniji faktori izvedene klasifikacije bilo bi dobro spomenuti: veličinu urbanih sredina, pol, bračni status i tipove domaćinstva,

mjesečna primanja kroz kupovnu moć, privredni rast i stopu zaposlenosti, zatim ulogu lidera, porodice kao grupe uticaja, kao i situacione faktore iz grupe eksternih faktora; od interni faktora posebno se izdvajaju lični faktori kao što su godine, zanimanje, stil ličnosti i od psihičkih procesa opažanje, nagon, volja i emocije (Aleksić, Interni i eksterni faktori uticaja na profil potrošača i njihovo pozicioniranje u strategiji savremenog marketinga, doktorski rad, 2013)

Koliko je značajan uticaj porodice i drugih grupa, možemo vidjeti na različitim primjerima, a posebno se izdvajaju kao značajni situacioni faktori koji utiču na potrošače (Slavko Kovačević, 2008).

Teško je izdvojiti faktore uticaja pa ćemo ih iz tih razloga pokušati grupisati da bismo vidjeli kako bismo mogli kreirati snove strategije marketinga sa osvrtom na vanredne okolnosti a sve u cilju osnovnog postulata marketinga i marketing psihologije, a koji se ogleda u zadovoljstvu sa obe strane, i sa strane potrošača i sa strane kompanije.

Moguća i naizglednija je potpuna promjena svijesti potrošača i promjene profila samih potrošača na tržištu (www.ey.com/sr_rs, 2020). Trebamo prosvjetliti i podići svijest i na strani marketinga kao i poslovnih sistema.

Bosna i Hercegovina u ekonomskom smislu nije bila u uzlaznoj putanji ni prije pandemija, a posebni i eksplicitni problemi tek mogu da nastupe (Ekonomski i socijalni uticaj COVID 19, 2020).

Prethodna istraživanja su pokazala da su potrošači u svijetu više zabrinuti za ekonomske krahove i teškoće, čak u većem procentu nego za zdravlje. (www.accenture.com, 2020).

U jednom od istraživanja možemo pronaći i rezultate koji pokazuju da će u budućnosti definitivno doći do promjena u ponašanju potrošača i da su te promjene neizbježne. To istraživanje je pokazalo da će se promjene najviše ogledati u rastu online usluga i servisa, zatim povećanje brige i ulaganja finansijskih sredstava u zdravlje i prebacivanje potrošača na stil kupovine koju karakteriše minimalizam (crowdsourcingweek.com, 2020).

STATISTIČKO MODELIRANJE POTROŠAČKOG PROFILA U FUNKCIJI IZBORA OPTIMALNE STRATEGIJE MARKETINGA

Istraživački projekat podrazumijeva prikupljanje empirijske građe, kako bi se na adekvatan način grupisale osobine koje profilisu potrošači, a time uspostavila i optimalna marketing strategija koja bi se adaptirala modeliranom profilu.

Ideja je da se promotivne aktivnosti prilagode lokalnom privrednom ambijentu modelirajući skup osobina koji profilise zahtjeve i očekivanja, a time omogućavaju adekvatan odgovor na njih. Empirijski pristup modeliranju profila polazi od analize stvarnih pokazatelja, koje baziramo na rezultatima anketiranja ispitanika na području Bosne i Hercegovine.

Ispitanici su anketni upitnik popunjavali pomoću Google Forms, dostupnog na web stranici: https://docs.google.com/forms/d/1ZlfVtcsWMDQQFIObT9F_NiQW_U_7ia1sQgJuwaDP5HA/edit. Upitnik sadrži 23 pitanja, koji predstavljaju varijable (promjenljive) u modelu. Ispitivanju je pristupio 331 ispitanik¹, što čini opti-

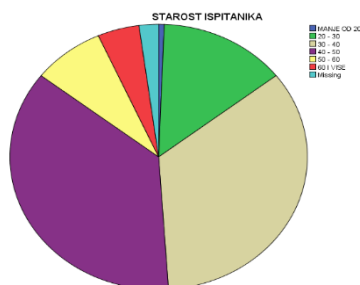
¹ Do trenutka obrade podataka, nakon obrade podataka desilo se još par pristupanja koja nisu uzeta u obzir

malan uzorak za modeliranje potrošačkog profila.

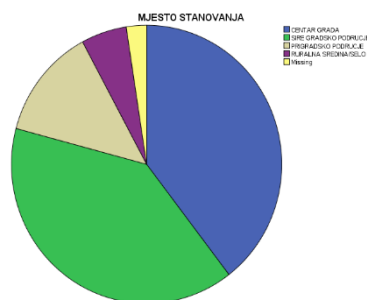
Zadatak istraživanja sastoji se u tome da se promjenljive grupišu u manji broj faktora koji će karakterisati potrošački profil i obezbijediti modelsku osnovu za formulaciju adekvatne strategije marketinga.

Faktorska analiza je tehnika redukcije promjenljivih u modelu njihovim grupisanjem u grupe međukorelacionih promjenljivih. Tehnike faktorske analize koriste se za pročišćavanje i sažimanje obuhvaćenih promjenljivih ili mjernih skala, povezivanjem srodnih promjenljivih u manji broj usaglašenih faktora ili podskala. Redukcija inicijalnih dimenzija modela podesna je za druge analize, kao što su višestruka regresija ili multivarijaciona analiza varijanse.

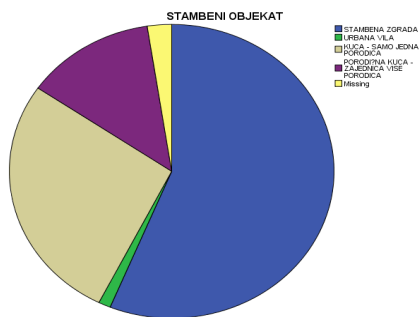
Struktura prikupljenih odgovora na pojedina pitanja, može se ilustrovati sledećim grafičkim prikazima.



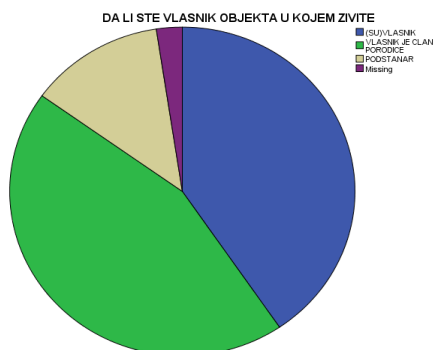
Slika 1. Struktura ispitanika prema starosti



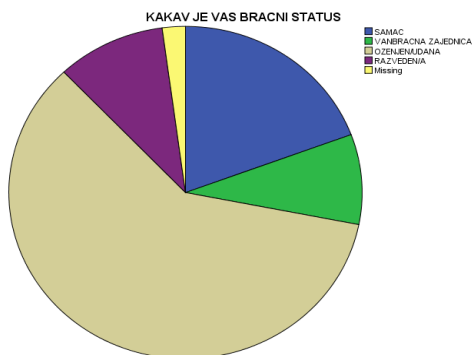
Slika 2. Struktura ispitanika prema mjestu stanovanja



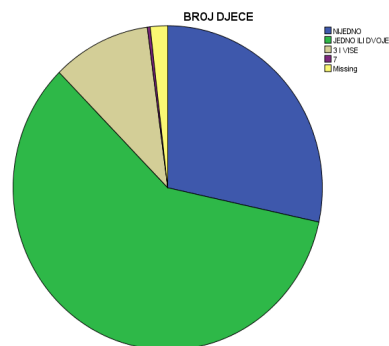
Slika 3. Struktura ispitanika prema vrsti stambenog objekta



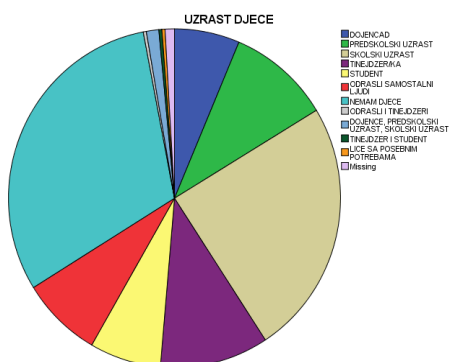
Slika 4. Struktura ispitanika prema vlasništvu stambenog objekta



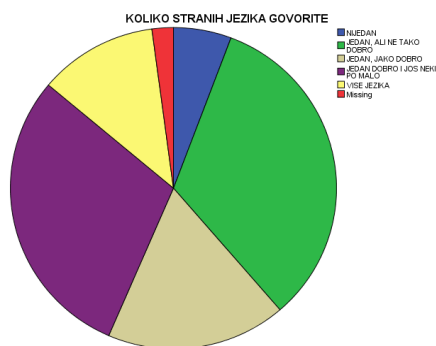
Slika 5. Struktura ispitanika prema bračnom statusu



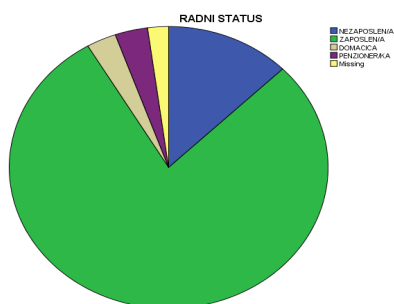
Slika 6. Struktura ispitanika prema broju djece



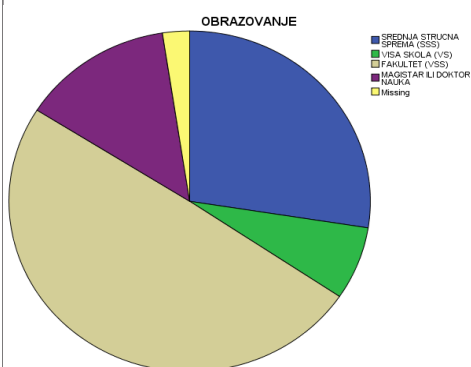
Slika 7. Struktura ispitanika prema uzrastu djece



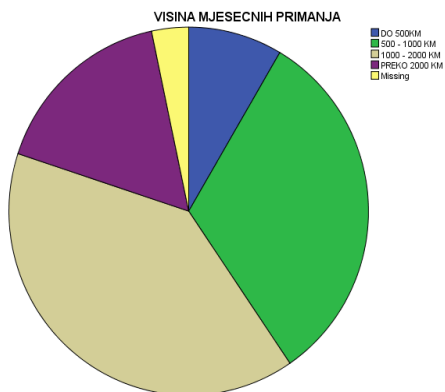
Slika 8. Struktura ispitanika prema poznavanju stranih jezika



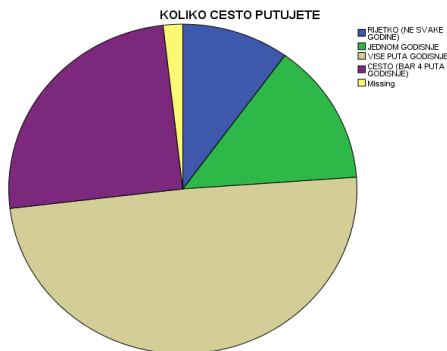
Slika 9. Struktura ispitanika prema radnom statusu



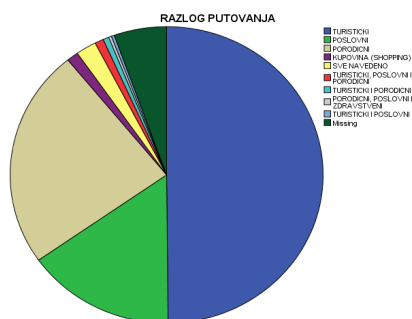
Slika 10. Struktura ispitanika prema obrazovnom profilu



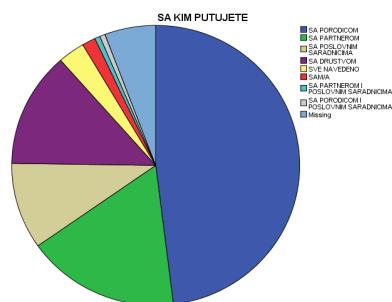
Slika 11. Struktura ispitanika prema visini mjesečnih primanja



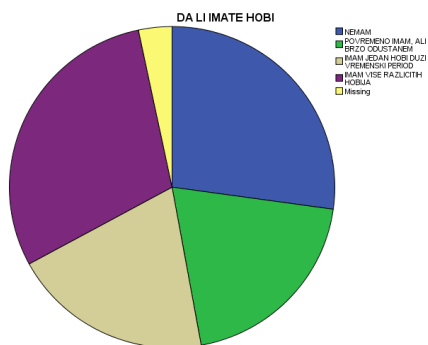
Slika 12. Struktura ispitanika prema učestalosti putovanja



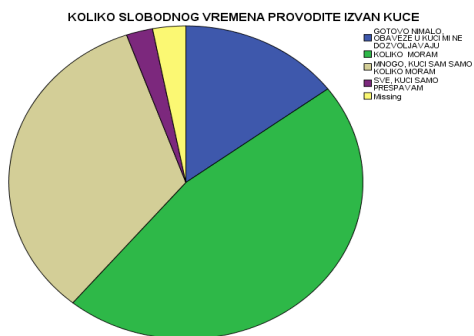
Slika 13. Struktura ispitanika prema razlogu putovanja



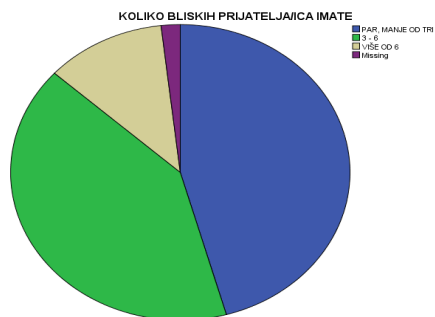
Slika 14. Struktura ispitanika prema izboru društva za putovanje



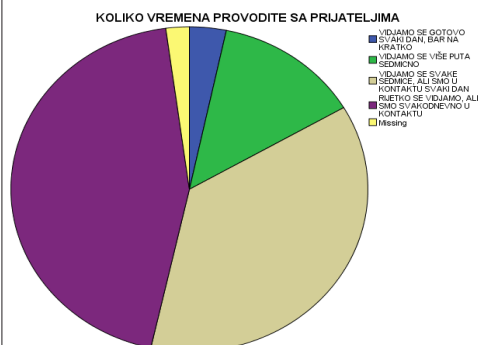
Slika 15. Struktura ispitanika prema sklonosti ka hobijima



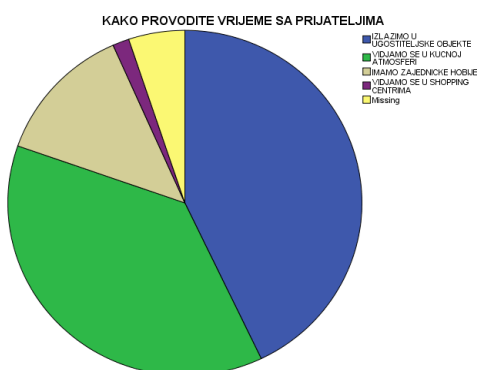
Slika 16. Struktura ispitanika prema organizaciji slobodnog vremena



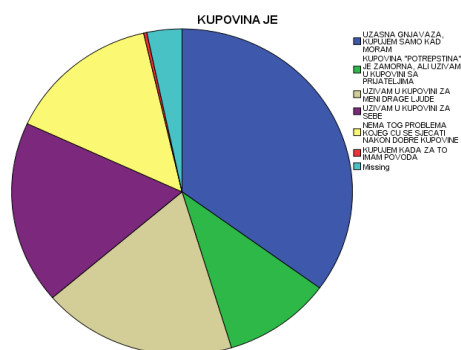
Slika 17. Struktura ispitanika prema broju bliskih prijatelja/ica



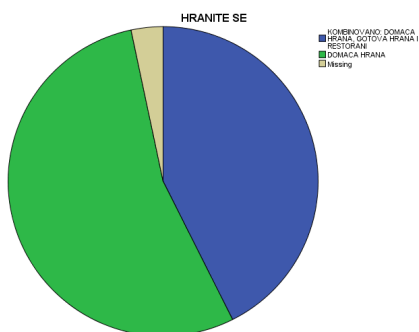
Slika 18. Struktura ispitanika prema učestalosti komunikacije sa prijateljima



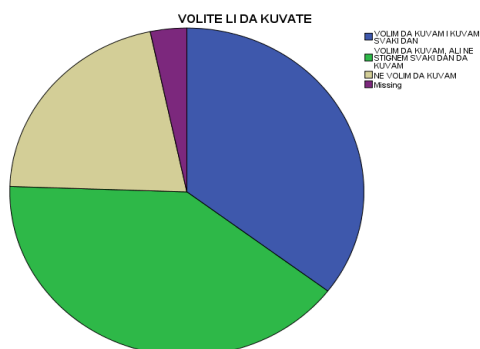
Slika 19. Struktura ispitanika prema načinu organizacije vremena sa prijateljima



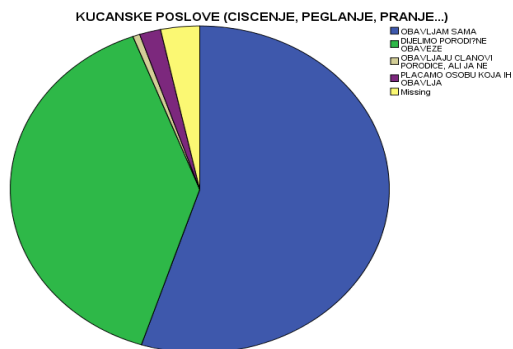
Slika 20. Struktura ispitanika prema doživljaju "kupovine"



Slika 21. Struktura ispitanika prema organizaciji ishrane



Slika 22. Struktura ispitanika prema odnosu prema kupanju



Slika 23. Struktura ispitanika prema obavljanju kućanskih poslova

STATISTIČKO MODELIRANJE FAKTORA KOJI OPREDJELJUJU POTROŠAČKI PROFIL GRAĐANA BIH

Istraživački projekat odnosio se na analizu 23 promjenljive koje uključuju lične, socijalno – ekonomske, obrazovne i druge karakteristike stanovnika kako bi se dobile karakteristike potrošača na tržištu zahvaćenom istraživanjem.

Inicijalno je formirana matrica korelacije, gdje je dokazana opravdanost primjene faktorske analize na odabranom uzorku.²

Analiza glavnih komponenti otkrila je prisustvo devet komponenti sa karakterističnim vrijednostima većim od 1, koje objašnjavaju 10,8; 9,4; 7,3; 6,8; 6,0; 5,8; 5,4; 5,2 i 4,5 % varijabiliteta, što ukupno iznosi 61,4 % varijanse. Dijagram prevoja nalaže da se u daljem istraživanju izdvoji 5 komponenti, koje objašnjavaju 40,5% ukupne varijanse. Radi lakšeg tumačenja rezultata provedena je oblim rotacija ovih faktora, dobijeno rješenje prikazujemo u narednoj tabeli.

Tabela 24. Matrica faktorskih težina i korelacija promjenljivih sa oblim rotacijom petofaktorskog rješenja za promjenljive u modelu potrošačkog profilisanja

Promjenljiva	Faktorske težine					Koeficijenti korelacije promjenljive i faktora					Dio varijanse objašnjen zajedničkim faktorima
	Komponenta					Komponenta					
	1	2	3	4	5	1	2	3	4	5	
Visina mjesečnih primanja	.48	.13	.00	.14	.13	.47	.12	-.02	.10	.13	.30
Stambeni objekat	-.47	.17	.02	.09	.08	-.48	.16	-.01	.13	.07	.32
Obrazovanje	.46	-.01	-.06	-.01	-.08	.46	.00	-.04	-.05	-.07	.27
Koliko često putujete	.43	.01	.01	.01	.24	.43	.00	-.01	-.03	.24	.23
Mjesto stanovanja	-.44	.00	-.05	.14	.12	-.45	.00	-.07	.17	.12	.32
Koliko stranih jezika govorite	.41	-.23	-.18	-.14	.25	.42	-.23	-.20	-.18	.29	.27

² Matrica interkorelacije sadrži mnogo (iznad 60%) koeficijenata čija je vrijednost iznad 0,3. Vrijednost KMO testa je $0,654 > 0,6$, dok Batlerov test sferičnosti dostiže zadovoljavajuću statističku značajnost (Sig. $p=0,000$)

Kakav je vas bračni status	-.09	.74	-.03	-.15	.14	-.07	.73	-.08	-.15	.11	.48
Broj djece	-.19	.70	-.10	-.13	.02	-.18	.70	-.13	-.11	.00	.47
Starost ispitanika	.21	.46	.03	.11	-.18	.20	.46	.03	.09	-.20	.38
Uzrast djece	.07	-.41	.05	.09	-.09	.06	-.41	.08	.08	-.08	.45
Da li ste vlasnik objekta u kojem živite	-.24	-.34	-.08	-.05	.09	-.24	-.34	-.08	-.03	.12	.17
Radni status	.06	.30	.02	.24	-.23	.04	.29	.04	.24	-.26	.26
Koliko slobodnog vremena provodite izvan kuće	-.05	-.03	.57	.08	.02	-.05	-.06	.57	.07	-.06	.20
Sa kim putujete	.04	-.16	.40	-.03	.25	.04	-.19	.37	-.04	.21	.19
Da li imate hobi	-.06	.19	.33	.00	-.03	-.06	.18	.32	.00	-.08	.16
Razlog putovanja	.00	.14	-.21	.19	.20	-.01	.14	-.25	.19	.22	.15
Volite li da kuvate	.09	-.07	-.05	.57	-.08	.04	-.06	-.05	.57	-.08	.23
Kako provodite vrijeme sa prijateljima	.00	-.03	-.09	-.39	-.14	.03	-.02	-.06	-.39	-.12	.17
Hranite se	.10	.03	.00	-.31	.00	.12	.02	.01	-.32	.01	.21
Koliko vremena provodite sa prijateljima	-.10	-.12	.00	.21	-.01	-.12	-.12	.00	.22	-.01	.10
Kupovina je	.02	.07	.05	-.23	.32	.04	.05	.01	-.24	.28	.14
Kucanske poslove (cisćenje, peglanje, pranje...)	-.03	.03	.01	-.14	-.30	-.02	.04	.04	-.14	-.27	.16
Koliko bliskih prijatelja/ica imate	.06	-.07	.18	-.02	-.20	.06	-.07	.21	-.03	-.22	.10

NAPOMENA: u tabeli su podebljanje vrijednosti koje označavaju glavnu faktorsku težinu promjenljive

Izvor: (Aleksić, Landika, & Barjaktarević, Istraživanje i analiza, 2020)³

ZAKLJUČNA RAZMATRANJA

Profilisanje potrošača nije univerzalno i ne može se generalizovati za globalno tržište, osobito ako se programira za ponuđače unutar odabrane geografske jedinice. Istraživačka pretpostavka je da bi se na drugoj teritorijalnoj jedinici dobili različiti rezultati i profilisala druga tipologija potrošača, međutim tu pretpostavku je protrebno provjeriti, što otvara mogućnosti novih istraživačkih projekata. Za očekivati je da se dobije možda i drugačija perspektiva samih faktora kao i drugačija grupa faktora uko-liko bi se istraživanje uradilo u drugo vrijeme i na drugom geografskom području. Ipak, trenutni rezultati pokazuju sa čime se marketing kao i strategija marketinga suočava. Analizom empirijskih podataka generisano je pet faktora koji profilisu potrošača i to:

- Faktor I, koji obuhvata: visinu mjesečnih primanja, vrstu stambenog objekta (-), učestalost putovanja, mjesto stanovanja (-) i poznavanje stranih jezika;
- Faktor II, koji obuhvata: bračni status, broj djece, starost ispitanika, uzrast

³ Analiza rađena u IBM SPSS 20

- djece (-), vlasništvo nad stambenim objektom (-) i radni status;
- Faktor III, koji obuhvata: vezanost za „kuću“ izvan radnog vremena, izbor društva za putovanje (-) i sklonost za bavljenje hobijima (-);
- Faktor IV, koji obuhvata: sklonost ka kuvanju, način provođenja vremena sa prijateljima (-) i način ishrane (-);
- Faktor V, koji obuhvata: doživljaj kupovine i način obavljanja kućanskih poslova.

Zbog niskog intenziteta saglasnosti sa izdvojenim faktorima ($<0,3$) promjenljive: razlog putovanja, količina vremena provedenog sa prijateljima i broj prijatelja/ica ne uključuje se u faktore koji opredjeljuju potrošački profil.⁴ Istraživanjem se izdvojila druga grupa faktora i to faktor II, koji obuhvata: bračni status, broj djece, starost ispitanika, uzrast djece, vlasništvo nad stambenim objektom i radni status. Potrošači u okviru ovih faktora najviše reaguju na potrošnju. Analiza podataka i generisanje upravljačkih informacija kojima se profilisu potrošači, može se provesti i na drugim teritorijalnim jedinicama i u drugim vremenskim okvirima, a zasnivaju se na poznavanju alata za prikupljanje i obradu podataka, a nakon toga konsultantsku uslugu upravljačko – marketinškog prilagođavanja strategijskih opredjeljenja i poslovne politike u skladu sa generisanim rezultatima.

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⁴ Rezultati primjene Crombach Alphe potvrđuju izbor promjenljivih u faktorskoj analizi

STATISTICAL MODELING OF CONSUMER PROFILES IN ADAPTATION OF MARKETING STRATEGY IN CONDITIONS OF COVID-19 PANDEMIC

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Summary: *Business activity and the production portfolio of business systems are directed to the consumers' requirements by marketing activities, therefore, there are situations in which these activities create and stimulate certain needs and requirements. Market creation is a complex activity that affects a large number of disciplines and synergistically creates satisfaction with the product and / or service, which, in a pandemic, is a special challenge for the creators of the product portfolio, especially for distribution channels. Distribution of products and / or services is a key factor of business success in the conditions of social distance and insufficiently developed technical - technological support for the transition to the virtual sphere of business and communication. A useful base of business activity includes adequate modeling of consumer profiles in order to adapt the marketing strategy to them, which ultimately provides guidelines for market positioning as a precondition for business efficiency. Creating consumer profiles requires a model analysis of habits, preferences, talents, personal and socio - psychological characteristics that allow the creation of similar groups, and thus the adaptation of marketing strategies in line with the created consumer profiles. The empirical basis of the proposed solutions enables a confidence in the modeled information, and thus reliability in their objectiveness, which enables business flexibility conditioned by external stimuli, such as the COVID - 19, but it can also be used in other business conditions. The aim of the research is to establish a correlation and find answers on how to fit consumer profiles and their purchase under pandemic conditions. Consumer purchase depends on numerous factors, both internal and external, which are valid in regular conditions as well. Considering the current conditions, it is necessary to evaluate consumers' behaviour during the purchase. Consumer profiling is not universal and cannot be generalized for the global market, especially if it is programmed for providers within a selected geographic unit. The research assumption is that different results would be obtained in another territorial unit and a different consumer typology would be profiled, but this assumption needs to be checked, which opens up the possibilities of new research projects. The research marked off another group of factors, known as factor II, which includes: marital status, number of children, respondent's age, children's age, ownership of a residential building and em-*

ployment status. Consumers' reaction to consumption is mostly within these factors. Data analysis and generation of management information that profiles consumers can be performed in other territorial units and in other time frames, and they are based on the knowledge of tools for data collection and processing, and then consulting service management - marketing adjustment of strategic commitments and business policy in accordance with the generated results.

Keywords: *consumer profile; stochastic modeling; marketing strategy; empirical grounding; business efficiency.*

The JEL Classification: *C1, M3, M11, M31.*



DOPRINOS MIGRACIJA EKONOMSKOM RASTU: PRIMJER GRADA ZAGREBA

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Sažetak: Problematika rada pripada području migracija i ekonomije. Veza između migracije i ekonomije dokazana je na globalnoj razini, a što se tiče Republike Hrvatske, posebno važno ju je promatrati za Grad Zagreb koji je najznačajnije migracijsko i ekonomsko središte u Republici Hrvatskoj. Također, ulazak Republike Hrvatske u Europsku uniju potencirao je promatranje i istraživanje navedene veze jer su se stvorile pretpostavke za slobodnije kretanje i zapošljavanje stanovništva Republike Hrvatske i Grada Zagreba unutar područja Europske unije. Cilj rada je utvrditi doprinos migracija ekonomskom rastu Grada Zagreba. Hipoteza iznesena u radu je da postoji značajan doprinos migracija ekonomskom rastu Grada Zagreba. Empirijski dio rada temelji se na korelacijama i regresijskim analizama utjecaja nezavisnih varijabli koje se odnose na migracijska kretanja Grada Zagreba (ukupne, unutarnje i vanjske migracije Grada Zagreba) na zavisne varijable koje se odnose na ekonomsku aktivnost u Gradu Zagrebu (BDP i BDP po stanovniku Grada Zagreba). Hipoteza iznesena u radu je većim dijelom dokazana jer rezultati ukazuju na značajan utjecaj varijabli ukupne i vanjske migracije na BDP Grada Zagreba i BDP po stanovniku Grada Zagreba. Rezultati istraživanja mogu poslužiti donositeljima odluka u Gradu Zagrebu kao podloga za maksimizacijom ekonomske koristi koju od migracija mogu imati. Također, rad može služiti kao podloga za daljnja istraživanja koja bi se bavila analizom kanala utjecaja migracija na ekonomski rast Grada Zagreba.

Ključne riječi: migracije; ekonomski rast; Grad Zagreb.

JEL klasifikacija: A12, C10, 015.

UVOD

Tema doprinosa migracija ekonomskom rastu bilo kojeg područja u Republici Hrvatskoj posebno je značajna u zadnja dva desetljeća u kojima se, između ostaloga, dogodila svjetska ekonomska kriza, ulazak Republike Hrvatske u Europsku uniju (koji

je omogućio slobodnije kretanje stanovništva Republike Hrvatske i Grada Zagreba na području zemalja Europske unije), europska migrantska kriza, ali i trenutna pandemija uzrokovana pojavom bolesti COVID-19. Navedeni događaji utjecali su na unutarnje i vanjske migracije, ali i na ekonomsku aktivnost Republike Hrvatske. Grad Zagreb kao središte ekonomske aktivnosti (ali i društvene, kulturne, znanstvene i drugih aktivnosti) u Republici Hrvatskoj u pogledu navedenog posebno je važan za istraživanje jer značajnije promjene u migracijama i ekonomskom rastu Grada Zagreba posljedično mogu utjecati na situaciju cijele Republike Hrvatske. Cilj rada je istražiti doprinos migracija ekonomskom rastu Grada Zagreba u razdoblju od 2011. godine kada je bio zadnji popis stanovništva do 2017. godine do kada postoje podatci o ekonomskoj aktivnosti u Gradu Zagrebu. Hipoteza je da je doprinos migracija ekonomskom rastu Grada Zagreba značajan. U empirijskom dijelu rada koriste se korelacije i regresijske analize. Varijable koje se odnose na migracije su ukupne, unutarnje i vanjske migracije dok su pokazatelji ekonomske aktivnosti BDP i BDP po stanovniku Grada Zagreba. Rad donosi doprinos donositeljima politika u Gradu Zagrebu vezanim za migracije jer im olakšava donošenje odluka i omogućuje maksimizaciju ekonomske dobrobiti koju migracije donose Gradu Zagrebu. Nakon uvodnog dijela rada, u drugom se dijelu objašnjava teorijski okvir utjecaja migracija na ekonomski rast, treći dio odnosi se na migracijska kretanja u Gradu Zagrebu u promatranom razdoblju, dok četvrti dio pokazuje kretanje ekonomske aktivnosti u Gradu Zagreba u promatranom razdoblju. Peti dio rada je empirijsko istraživanje doprinosa migracija ekonomskom rastu Grada Zagreba, a šesti dio je zaključak.

TEORIJSKI OKVIR UTJECAJA MIGRACIJA NA EKONOMSKI RAST

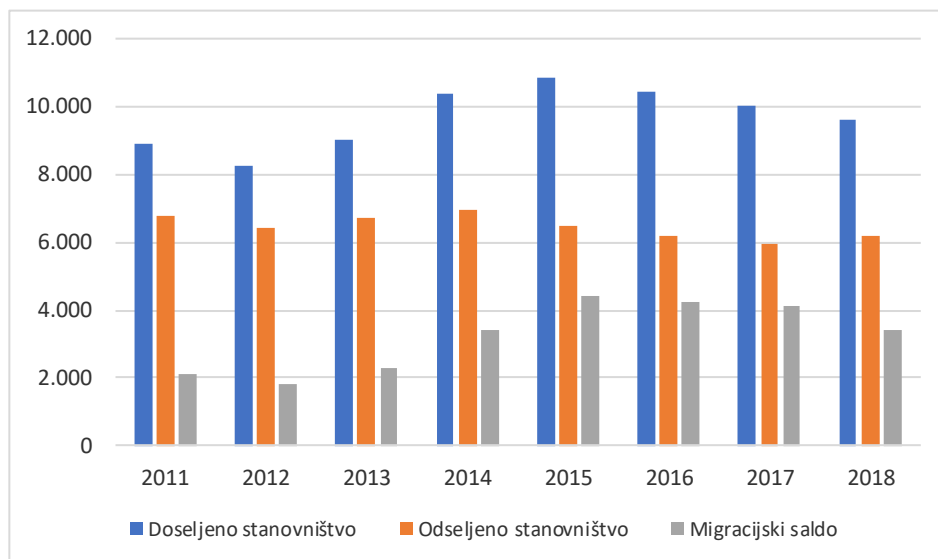
Migracije s ekonomskog stajališta važno je promatrati iz nekoliko razloga. Prvi razlog je potencijalni utjecaj migracija na svjetsko gospodarstvo. Tako Clemens (2011) navodi da bi smanjenjem barijera međunarodnom kretanju ljudi dovelo do povećanja BDP-a (konzervativnom procjenom) od 20 do 60 %, dok su (Walmsley & Winters, 2005) izračunali su da bi dodatna stopa emigracije od 1,6 % iz zemalja u razvoju mogla dodati dodatnih 1,2 % svjetskom BDP-u.

Osim utjecaja migracija na BDP na globalnoj razini, utjecaj migracija na ekonomski rast može se promatrati sa stajališta zemalja imigracije i sa stajališta zemalja emigracije. Što se tiče zemalja imigracije, one nastoje imigracijskim politikama privući mlado radno sposobno stanovništvo koje bi popunilo prazninu na tržištu rada koja je nastala kao posljedica starenja stanovništva i oni privlače migrante koji posjeduju određena znanja i vještine koje upotpunjuju ljudski kapital zemlje u koju se doseljavaju (Boubtane, Dumont, & Rault, 2013). Osim toga, učinci imigracije mogu se promatrati i kroz poboljšanje učinkovitosti međunarodne raspodjele resursa, pozitivan fiskalni doprinos, kao i povećanje inovacija (Belaid & Slany, 2018). Nadalje, istraživanja su pokazala da brojni ispitanici smatraju raznolikost kao pokretačku snagu razvoja, a temeljenu na toleranciji, poštovanju, razumijevanju i prihvaćanju (Knežević, Kulaš, & Duspara, 2014). Također, u određenim zemljama u Europi potvrđena je pozitivna veza između BDP-a po stanovniku i kretanja migracija, a to se, prije svega, odnosi na one zemlje koje primjenjuju selektivnu migracijsku politiku prema stranim doseljenicima (Gonzalez-Gomez & Otero Giraldez, 2011). Dodatno, imigracija može potaknuti na porast razine inovacija u zemlji (Akcigit, Grigsby, & Nicholas, 2017) i (Böhme

& Kups, 2017). Boubtane i suradnici su pak na osnovu modela pokušali procijeniti uzročnost veze između migracija i BDP-a za 22 zemlje iz OECD-a u razdoblju od 1986. do 2006. godine. Njihov zaključak je da neto migracija povećava stopu rasta BDP-a po stanovniku, ali u iznosu koji nije značajan. Tako navode da povećanje neto migracije za 1 postotni bod ima pozitivan utjecaj na rast u iznosu od 0,1 %. Međutim, u literaturi se objašnjava i pozitivan utjecaj migracija na ekonomski rast zemalja emigracije. Prema (Brunow, Nijkamp, & Poot, 2015) doznake koje imigranti šalju u svoje matične države mogu biti značajno veće od smanjenja proizvodnje koje se dogodilo u matičnoj državi što će dovesti do povećanja dohotka stanovništva u matičnoj zemlji. Nadalje, isti autori navode još dvije koristi koje matične zemlje (uglavnom zemlje u razvoju) mogu imati od emigracije. Jedna se ogleda u većoj dodanoj vrijednosti koju obrazovanje u razvijenijim zemljama nudi uz činjenicu da neće svi oni emigrirati, nego će se neki vratiti i u matičnu zemlju, dok se druga odnosi na poslovnu suradnju i umrežavanje imigranata s poduzećima iz matične zemlje. Prema navodima autora (Foley & Kerr, 2011) u odnosu na Brunow i suradnike, oni navode da je jedna od koristi koje emigracija donosi ta da pokreće izravna strana ulaganja u matičnoj zemlji od poduzeća iz zemlje imigracije. S druge strane, (Dos Santos & Postel-Vinay, 2003) u odnosu na Brunown i suradnike navode da zemlje u razvoju mogu imati koristi i od privremene migracije, povratne migracije, cirkulacije stanovništva, a navode i procjenu da bi se oko jedne trećine migranata moglo dugoročno vratiti u matične zemlje što bi u tim zemljama dovelo do porasta ljudskog kapitala i poduzetništva.

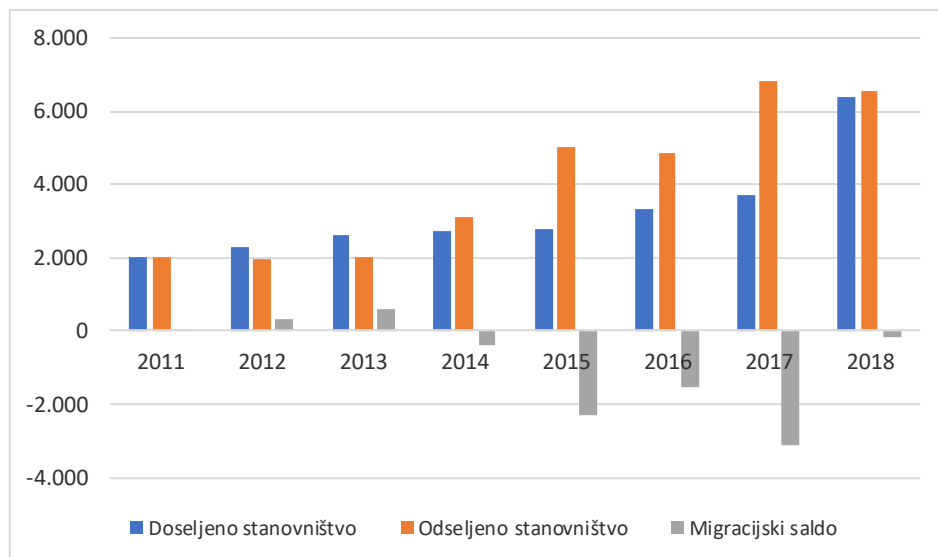
MIGRACIJSKI PROCESI GRADA ZAGREBA U RAZDOBLJU OD 2011. DO 2018. GODINE

Za prikaz migracijskih procesa u Gradu Zagrebu odabrano je razdoblje od 2011. kada je bio zadnji popis stanovništva do 2018. za koju još postoje dostupni podatci. Pri tome će se analizirati unutarnje migracije Grada Zagreba, vanjske migracije Grada Zagreba i ukupne migracije Grada Zagreba u navedenom razdoblju. Iz grafikona 1 može se zaključiti kako Grad Zagreb ima pozitivan unutarnji migracijski saldo u cijelom promatranom razdoblju, što znači da Grad Zagreb i dalje privlači stanovništvo iz ostatka Republike Hrvatske.

Grafikon 1. Unutarnji migracijski saldo u Gradu Zagrebu u razdoblju od 2011. do 2018. godine

Izvor: Prilagođeno prema podacima Državnog zavoda za statistiku

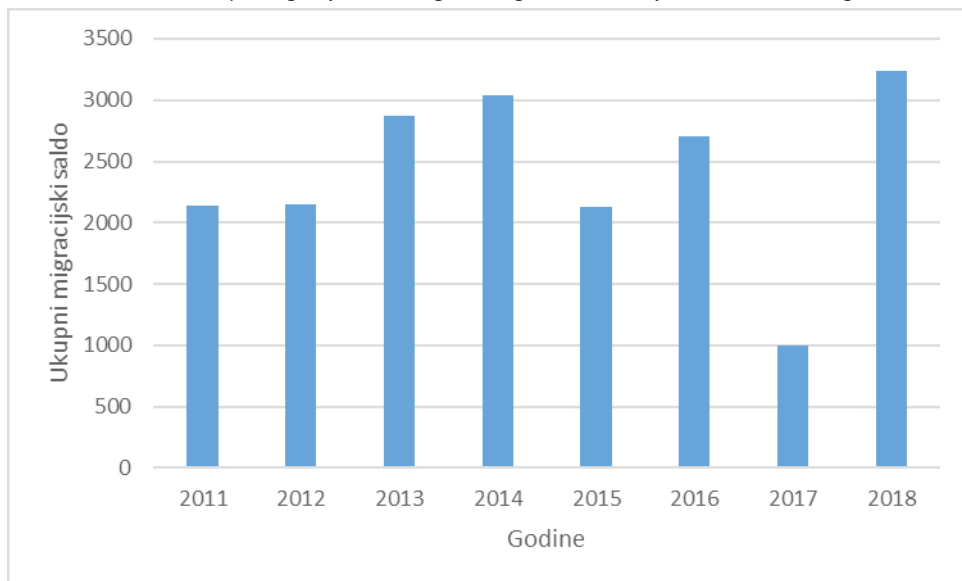
Što se tiče vanjskih migracija, vidljivo je da se i broj doseljenog stanovništva i broj odseljenog stanovništva u promatranom razdoblju povećao, s tim da je od 2014. do 2018. godine vanjski migracijski saldo Grada Zagreba negativan, što znači da je broj odseljenog stanovništva veći od broja doseljenog stanovništva.

Grafikon 2. Vanjski migracijski saldo u Gradu Zagrebu u razdoblju od 2011. do 2018. godine

Izvor: Prilagođeno prema podacima Državnog zavoda za statistiku

Na grafikonu 3 prikazan je ukupni migracijski saldo u Gradu Zagrebu za svaku promatranu godinu. Bez obzira na negativan vanjski migracijski saldo od 2014. do 2018. godine, ukupan migracijski saldo pozitivan je za svaku godinu promatranog razdoblja.

Grafikon 3. Ukupni migracijski saldo u gradu Zagrebu u razdoblju od 2011. do 2018. godine

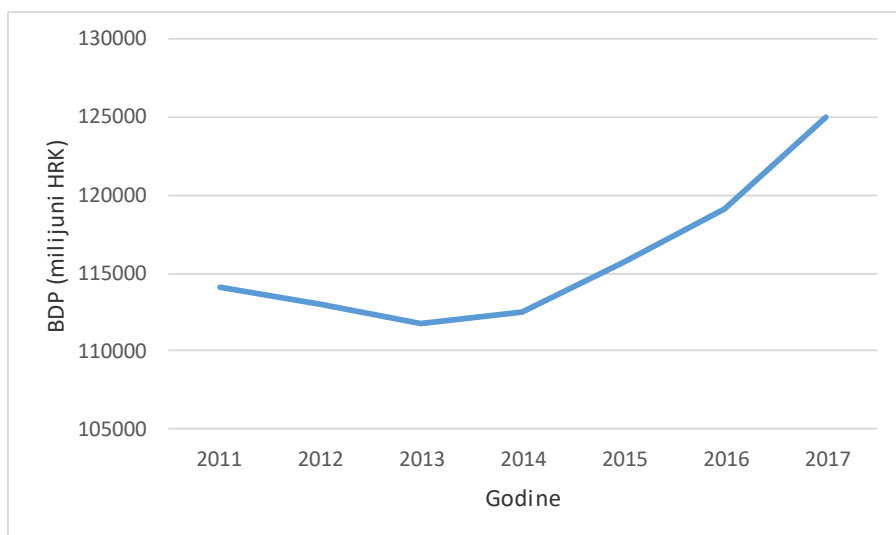


Izvor: Prilagođeno prema podatcima Državnog zavoda za statistiku

Na temelju prethodno analiziranog vidljivo je kako se u migracijskim procesima Grada Zagreba ističu unutarnje migracije. To i ne čudi jer mnogim vanjskim migrantima Grad Zagreb nije privlačan, iako je najveće gospodarsko središte u Hrvatskoj. To proizlazi prije svega zbog niskog BDP-a po stanovniku u usporedbi s ostalim gradovima u Europi, nedovoljne konkurentnosti u odnosu na druge gradove, razvoja nedovoljno zasnovanog na tehnologiji i inovacijama, nedostatnog poticaja korištenja znanja, tehnologije i razvoja inovacija kod malih i srednjih poduzetnika, nedovoljne orijentiranosti na inozemna tržišta, nedovoljne podrške razvoju poduzetničke infrastrukture itd (Budak, Đokić, Villa, & Slijepčević, 2016).

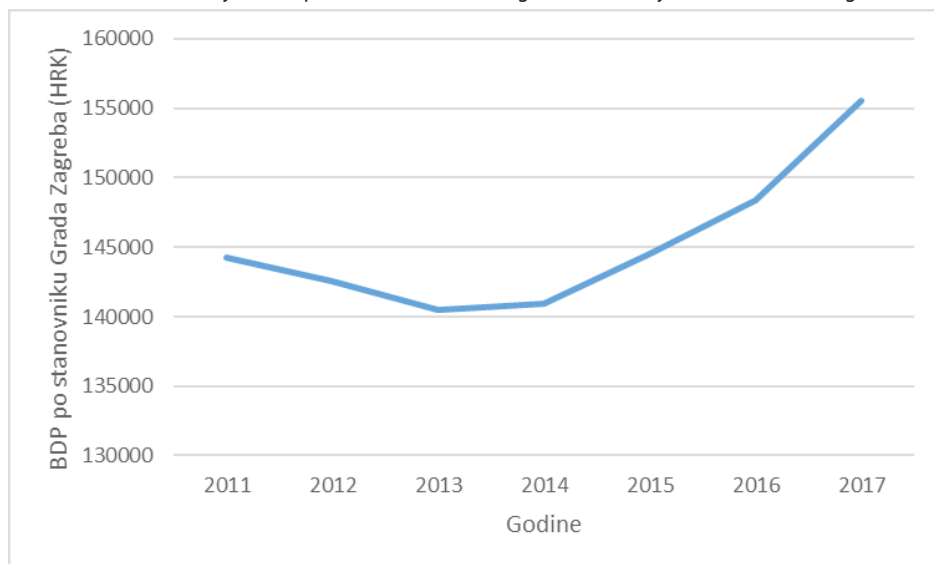
EKONOMSKA AKTIVNOST U GRADU ZAGREBU U RAZDOBLJU OD 2011. DO 2017. GODINE

Kao pokazatelji ekonomske aktivnosti u Gradu Zagrebu odabrani su BDP i BDP po stanovniku. Iz grafikona 4 koji prikazuje kretanje BDP-a Grada Zagreba u razdoblju od 2011. do 2017. godine vidljivo je da se BDP Grada Zagreba smanjivao u razdoblju od 2011. do 2013. godine nakon čega je započeo rast koji je trajao do 2017. godine. Također, vidljivo je da je razina BDP-a Grada Zagreba 2017. godine iznad razine BDP-a Grada Zagreba 2011. godine.

Grafikon 4. Kretanje BDP-a Grada Zagreba u razdoblju od 2011. do 2017. godine

Izvor: Izrada autora prema podacima dostupnima na internetskoj stranici Grada Zagreba (pristupljeno 6. 12. 2020.)

Iz grafikona 5 u nastavku koji prikazuje kretanje BDP-a po stanovniku Grada Zagreba u razdoblju od 2011. do 2017. godine vidljivo je da se BDP po stanovniku Grada Zagreba smanjivao u razdoblju od 2011. do 2013. godine nakon čega je započeo rast koji je trajao do 2017. godine. Također, vidljivo je da je razina BDP-a po stanovniku Grada Zagreba 2017. godine iznad razine BDP-a po stanovniku Grada Zagreba 2011. godine.

Grafikon 5. Kretanje BDP-a po stanovniku Grada Zagreba u razdoblju od 2011. do 2017. godine

Izvor: Izrada autora prema podacima dostupnima na internetskoj stranici Grada Zagreba (pristupljeno 6. 12. 2020.)

EMPIRIJSKO ISTRAŽIVANJE DOPRINOSA MIGRACIJA EKONOMSKOM RASTU GRADA ZAGREBA

Empirijski dio rada sastoji se od korelacija i regresijskih analiza. Nezavisne varijable u regresijskim analizama su varijable koje se odnose na migracije, a to su: ukupne, unutarnje i vanjske migracije Grada Zagreba, dok su zavisne varijable u regresijskoj analizi pokazatelji ekonomske aktivnosti: BDP Grada Zagreba i BDP po stanovniku Grada Zagreba. Kao što je već navedeno u radu, podatci o migracijskim kretanjima Grada Zagreba promatraju se od zadnjeg popisa stanovništva pa do zadnje dostupne godine (2018.), dok se podaci o ekonomskoj aktivnosti promatraju u godinama za koje su bili dostupni podatci za migracijska kretanja, ali bez 2018. godine za koju nisu bili dostupni podatci o ekonomskoj aktivnosti u Gradu Zagrebu. Ograničenje rada je relativno kratko razdoblje promatranja odabrane veze.

U tablici 1 u nastavku prikazani su ukupni migracijski saldo, kao i kretanje BDP-a u Gradu Zagrebu u razdoblju od 2011. do 2017. godine (od zadnjeg popisa stanovništva do zadnje dostupnih podataka o BDP-u Grada Zagreba), a koji su dostupni na službenoj internetskoj stranici Grada Zagreba.

Tablica 1. Ukupni, unutarnji i vanjski migracijski saldo, kao i BDP i BDP po stanovniku Grada Zagreba u razdoblju od 2011. do 2017. godine

Godine	Ukupni migracijski saldo	Unutarnji migracijski saldo	Vanjski migracijski saldo	BDP (milijuni HRK)	BDP po stanovniku (HRK)
2011	2139	2095	44	114098	144288
2012	2152	1832	320	113032	142538
2013	2871	2281	590	111733	140459
2014	3040	3421	-381	112565	140983
2015	2132	4420	-2288	115731	144542
2016	2706	4252	-1546	119096	148407
2017	1003	4102	-3099	125020	155541
2018	3242	3413	-171	Nema podataka.	Nema podataka.
Ukupno	19285	25816	-6531		

Izvor: Izrada autora prema podatcima dostupnima na internetskoj stranici Grada Zagreba (pristupljeno 6. 12. 2020.)

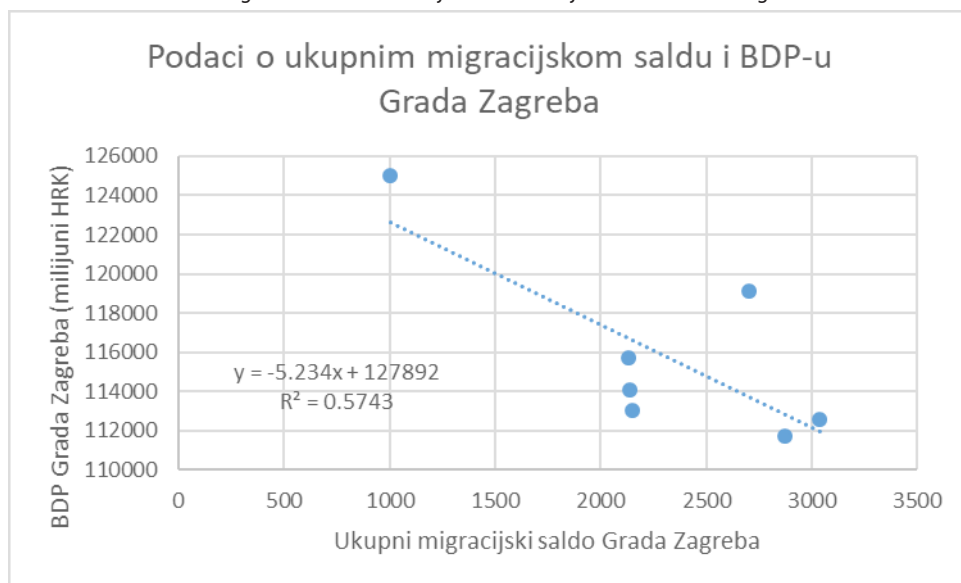
Prije prikaza dijagrama raspršenosti izračunati su koeficijenti korelacije između varijabli koje se odnose na migracije Grada Zagreba (ukupni, unutarnji i vanjski migracijski saldo) i varijabli koje se odnose na ekonomski rast Grada Zagreba (BDP i BDP po stanovniku) kako bi se utvrdio smjer i jakost veze između navedenih varijabli.

Tablica 2. Koeficijenti korelacije između nezavisnih varijabli (ukupni, unutarnji i vanjski migracijski saldo) i zavisnih varijabli (BDP i BDP po stanovniku) Grada Zagreba

Nezavisna varijabla	Zavisna varijabla	Koeficijent korelacije
Ukupni migracijski saldo	BDP	-0,76
Ukupni migracijski saldo	BDP po stanovniku	-0,80
Unutarnji migracijski saldo	BDP	0,65
Unutarnji migracijski saldo	BDP po stanovniku	0,57
Vanjski migracijski saldo	BDP	-0,87
Vanjski migracijski saldo	BDP po stanovniku	-0,83

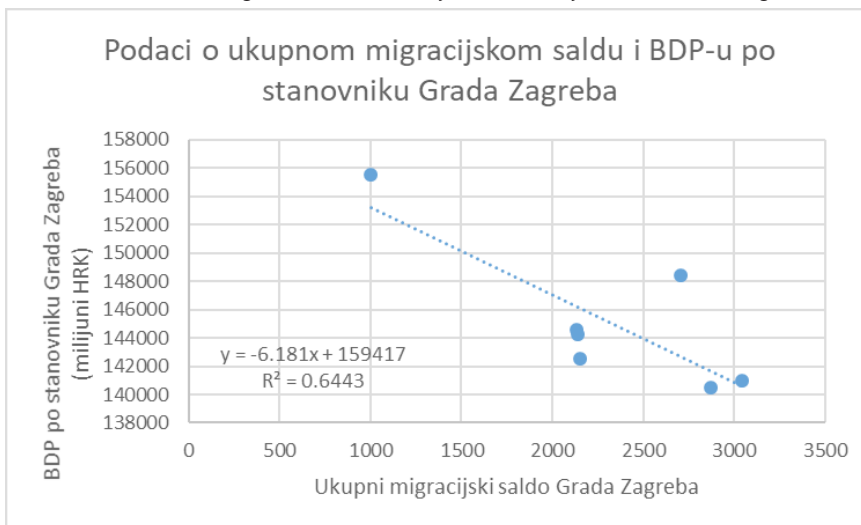
Izvor: izrada autora prema podacima iz tablice 1.

Iz tablice 2 vidljivo je da su korelacije između promatranih varijabli jake ili srednje jake, ali i da je predznak između određenih korelacija negativan. U nastavku će biti prikazani dijagrami raspršenosti i regresijske jednadžbe za sve promatrane veze.

Grafikon 6. Dijagram raspršenosti između ukupnog migracijskog salda kao nezavisne varijable i BDP-a Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine**Izvor:** izrada autora

Iz tablice 2 i grafikona 6 može se zaključiti da je veza između promatranih varijabli jaka i negativna. Koeficijent determinacije iznosi 0.5743, što znači da je 57.43 % veze između ukupnog migracijskog salda i BDP-a Grada Zagreba objašnjeno linearnim regresijskim modelom. Nadalje, analizom p-vrijednosti nezavisne varijable (rezultati u prilogu rada) može se zaključiti da je na razini značajnosti od 95 % varijabla ukupni migracijski saldo Grada Zagreba značajna za BDP Grada Zagreba.

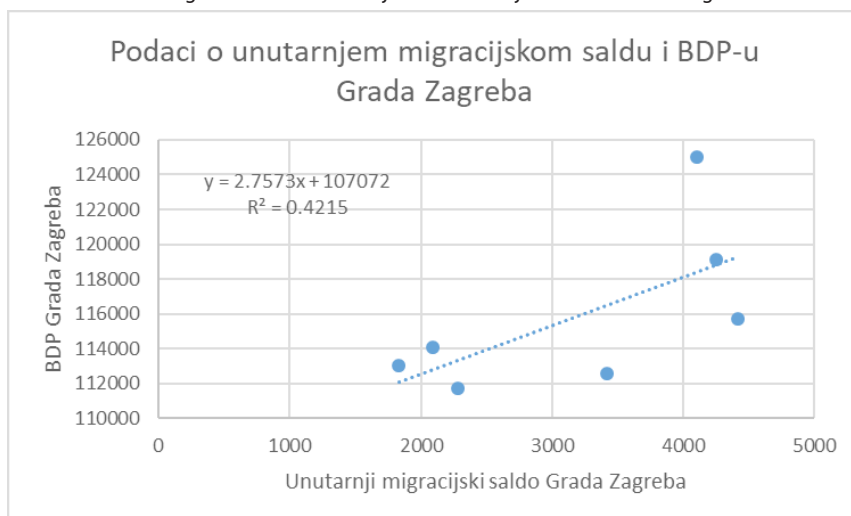
Grafikon 7. Dijagram raspršenosti između ukupnog migracijskog salda kao nezavisne varijable i BDP-a po stanovniku Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine



Izvor: izrada autora

Iz tablice 2 i grafikona 7 može se zaključiti da je veza između promatranih varijabli jaka i negativna. Koeficijent determinacije iznosi 0.6443, što znači da je 64.43 % veze između ukupnog migracijskog salda i BDP-a po stanovniku Grada Zagreba objašnjeno linearnim regresijskim modelom. Nadalje, analizom p-vrijednosti nezavisne varijable (rezultati u prilogu rada i) može se zaključiti da je na razini značajnosti od 95 % varijabla ukupni migracijski saldo grada Zagreba značajna za BDP po stanovniku Grada Zagreba.

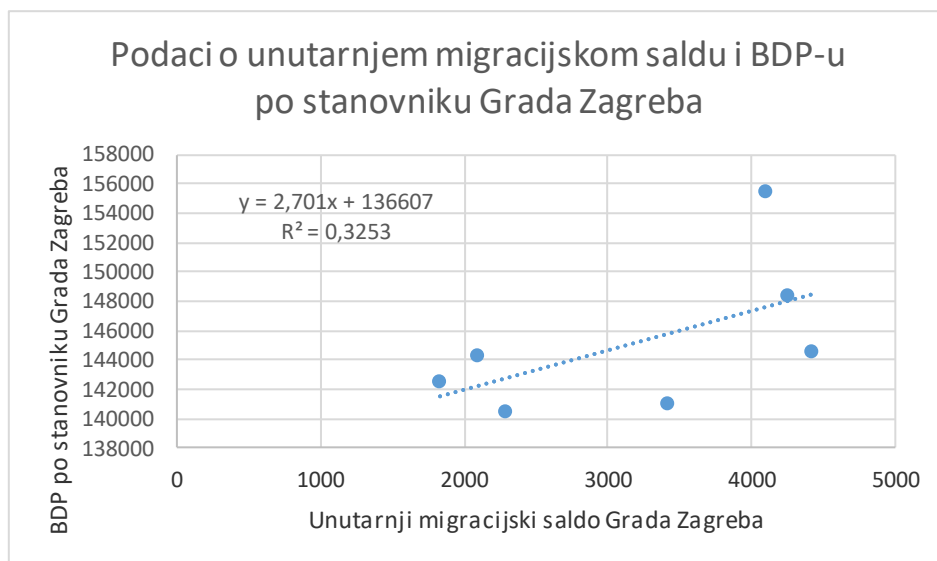
Grafikon 8. Dijagram raspršenosti između unutarnjeg migracijskog salda kao nezavisne varijable i BDP-a Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine



Izvor: izrada autora

Iz tablice 2 i grafikona 8 može se zaključiti da je veza između promatranih varijabli srednje jaka i pozitivna. Koeficijent determinacije iznosi 0,4215, što znači da je 42.15 % veze između unutarnjeg migracijskog salda Grada Zagreba i BDP-a Grada Zagreba objašnjeno linearnim regresijskim modelom. Nadalje, analizom p-vrijednosti nezavisne varijable (rezultati u prilogu rada) može se zaključiti da na razini značajnosti od 95 % varijabla unutarnji migracijski saldo Grada Zagreba nije značajna za BDP Grada Zagreba.

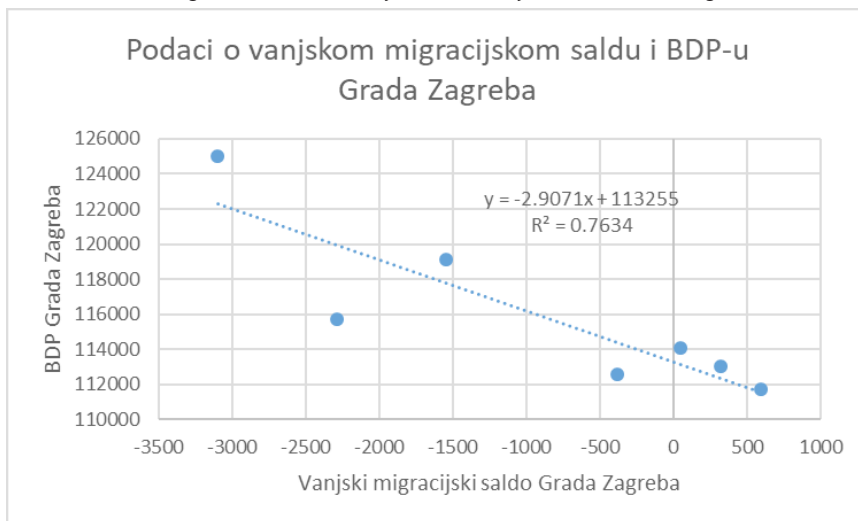
Grafikon 9. Dijagram raspršenosti između unutarnjeg migracijskog salda kao nezavisne varijable i BDP-a po stanovniku Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine



Izvor: izrada autora

Iz tablice 2 i grafikona 9 može se zaključiti da je veza između promatranih varijabli srednje jaka i pozitivna. Koeficijent determinacije iznosi 0.3253, što znači da je 32.53 % veze između unutarnjeg migracijskog salda Grada Zagreba i BDP-a po stanovniku Grada Zagreba objašnjeno linearnim regresijskim modelom. Nadalje, analizom p-vrijednosti nezavisne varijable (rezultati u prilogu rada) može se zaključiti da na razini značajnosti od 95 % varijabla unutarnji migracijski saldo Grada Zagreba nije značajna za BDP po stanovniku Grada Zagreba.

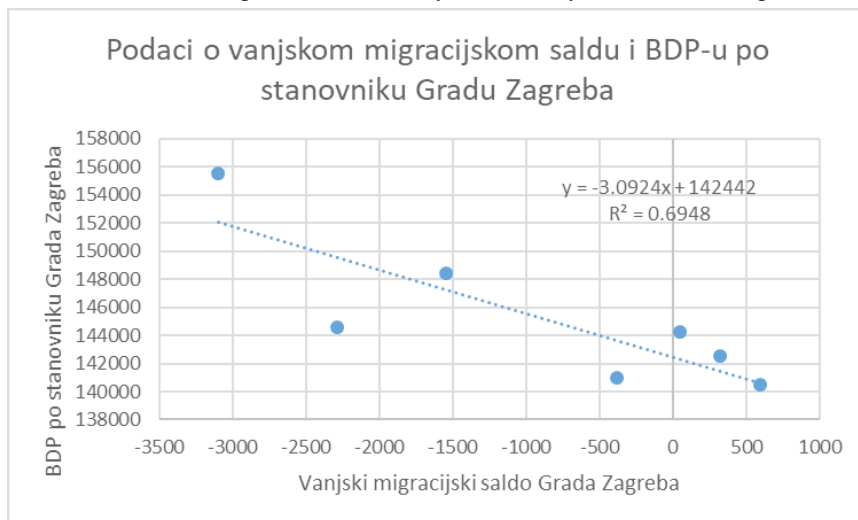
Grafikon 10. Dijagram raspršenosti između vanjskog migracijskog salda kao nezavisne varijable i BDP-a Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine



Izvor: izrada autora

Iz tablice 2 i grafikona 10 može se zaključiti da je veza između promatranih varijabli jaka i negativna. Koeficijent determinacije iznosi 0.7634, što znači da je 76.34 % veze između vanjskog migracijskog salda i BDP-a Grada Zagreba objašnjeno linearnim regresijskim modelom. Nadalje, analizom p-vrijednosti nezavisne varijable (rezultati u prilogu rada) može se zaključiti da je na razini značajnosti od 95 % varijabla vanjski migracijski saldo značajna za BDP Grada Zagreba.

Grafikon 11. Dijagram raspršenosti između vanjskog migracijskog salda kao nezavisne varijable i BDP-a po stanovniku Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine



Izvor: izrada autora

Iz tablice 2 i grafikona 11 može se zaključiti da je veza između promatranih jaka i negativna. Koeficijent determinacije iznosi 0.6948, što znači da je 69.48 % veze između vanjskog migracijskog salda Grada Zagreba i BDP-a po stanovniku Grada Zagreba objašnjeno linearnim regresijskim modelom. Nadalje, analizom p-vrijednosti nezavisne varijable (rezultati u prilogu rada) može se zaključiti da je na razini značajnosti od 95 % varijabla vanjski migracijski saldo Grada Zagreba značajna za BDP po stanovniku Grada Zagreba. Na temelju prikazanih rezultata može se zaključiti kako je hipoteza koja je postavljena u radu većim dijelom dokazana.

ZAKLJUČAK

Cilj rada bio je istražiti doprinos migracija ekonomskom rastu Grada Zagreba u razdoblju od 2011. godine do 2017. godine korištenjem korelacija i regresijskih analiza kako bi se dokazala pretpostavka o značajnom doprinosu migracija ekonomskom rastu Grada Zagreba. Analizom podataka dokazan je značajan negativan utjecaj varijabli ukupnih i vanjskih migracija na BDP Grada Zagreba i BDP po stanovniku Grada Zagreba. Navedeno je u skladu s nalazima iz pregleda literature gdje je objašnjeno da migracije mogu imati pozitivne ekonomske učinke ne samo na područja imigracije nego i na područja emigracije, odnosno matična područja. Nadalje, analizom je dokazan pozitivan utjecaj unutarnjih migracija na BDP i BDP po stanovniku Grada Zagreba, što je također u skladu s literaturom, ali taj utjecaj nije statistički značajan. Ograničenje rada ogleda se u relativno kratkom razdoblju promatranja navedenih odnosa. Rad služi kao podloga za donošenje odluka o migracijskim politikama Grada Zagreba, ali i za buduća istraživanja u kojima bi trebalo analizirati strukturu BDP-a Grada Zagreba i značajnost pojedinih kanala utjecaja migracija na ekonomski rast Grada Zagreba.

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THE CONTRIBUTION OF MIGRATION TO ECONOMIC GROWTH: THE EXAMPLE OF THE CITY OF ZAGREB

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Summary: *The problems in this paper belong to the field of migration and economy. The connection between migration and the economy has been proven on a global level, and as far as the Republic of Croatia is concerned, it is especially important to observe it through the City of Zagreb, which is the most important migration and economic center in the Republic of Croatia. Also, the accession of the Republic of Croatia to the European Union emphasized the observation and research of this connection because it created the preconditions for freer movement and employment of the population of the Republic of Croatia and the City of Zagreb within the European Union. The aim of this paper is to determine the contribution of migration to the economic growth of the City of Zagreb. The hypothesis presented in the paper is that there is a significant contribution of migration to the economic growth of the City of Zagreb. The disposition of the paper consists of six parts. The introduction explains the relevance of the topic, states the aim of the paper and hypotheses, explains the empirical part, the contribution of the paper and the disposition. The second part of the paper refers to the theoretical framework of the impact of migration on economic growth. The third part of the paper presents the migration processes of the City of Zagreb in the period from 2011 to 2018. The fourth part deals with economic activity in the City of Zagreb in the period from 2011 to 2017. The observed indicators of economic activity in the City of Zagreb are GDP and GDP per capita, and the graph in this part of the paper shows that GDP and GDP per capita in the observed period are higher at the end of the period than at the beginning. The fifth part of the paper refers to the empirical research of the contribution of migration to the economic growth of the City of Zagreb. The empirical part of the paper is based on correlations and regression analyses. This paper proves the hypothesis because the results indicate a significant impact of the variables of total and external migration on the GDP of the City of Zagreb and GDP per capita of the City of Zagreb. Decision-makers in the City of Zagreb can use the results of the research as a basis for maximizing the economic benefits they can get from migration.*

The conclusion provides an overview of the aim of the work, the results of the research, the limitations, the implications and the recommendations for future research.

Key words: *migrations; economic growth; City of Zagreb.*

JEL classification: *A12, C10, 015.*

Prilog 1. Rezultati regresijske analize između ukupnog migracijskog salda kao nezavisne varijable i BDP-a Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine

Regression Statistics								
Multiple R	0.757845079							
R Square	0.574329164							
Adjusted R Square	0.489194997							
Standard Error	3369.696901							
Observations	7							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	76601743.67	76601743.67	6.746165299	0.048405052			
Residual	5	56774286.04	11354857.21					
Total	6	133376029.7						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	127891.8981	4790.769029	26.69548404	1.37914E-06	115576.8343	140206.962	115576.8343	140206.962
X Variable 1	-5.233951687	2.015121424	-2.597338118	0.048405052	-10.41398622	-0.053917158	-10.41398622	-0.053917158

Izvor: izrada autora

Prilog 2. Rezultati regresijske analize između ukupnog migracijskog salda kao nezavisne varijable i BDP-a po stanovniku Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine

Regression Statistics								
Multiple R	0.802667251							
R Square	0.644274716							
Adjusted R Square	0.57312966							
Standard Error	3434.653166							
Observations	7							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	106829731	106829731	9.055790325	0.029780067			
Residual	5	58984211.85	11796842.37					
Total	6	165813942.9						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	159417.037	4883.118717	32.64656181	5.06711E-07	146864.5807	171969.4933	146864.5807	171969.4933
X Variable 1	-6.180967345	2.053966093	-3.009284022	0.029780067	-11.46085528	-0.901079416	-11.46085528	-0.901079416

Izvor: izrada autora

Prilog 3. Rezultati regresijske analize između unutarnjeg migracijskog salda kao nezavisne varijable i BDP-a Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine

Regression Statistics								
Multiple R	0.649244174							
R Square	0.421517998							
Adjusted R Square	0.305821597							
Standard Error	3928.247262							
Observations	7							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	56220396.97	56220396.97	3.643311251	0.114570417			
Residual	5	77155632.75	15431126.55					
Total	6	133376029.7						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	107071.7481	4855.844862	22.05007596	3.5623E-06	94589.40146	119554.0947	94589.40146	119554.0947
X Variable 1	2.757343374	1.444583716	1.908745989	0.114570417	-0.956077287	6.470764034	-0.956077287	6.470764034

Izvor: izrada autora

Prilog 4. Rezultati regresijske analize između unutarnjeg migracijskog salda kao nezavisne varijable i BDP-a po stanovniku Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine

Regression Statistics								
Multiple R	0.570391432							
R Square	0.325346386							
Adjusted R Square	0.190415663							
Standard Error	998.875877							
Observations	7							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	2405792.626	2405792.626	2.411210574	0.181176385			
Residual	5	4988765.088	997753.0176					
Total	6	7394557.714						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	-14295.54563	11273.64164	-1.268050386	0.260617354	-43275.36406	14684.2728	-43275.36406	14684.2728
X Variable 1	0.120453264	0.077571288	1.55280732	0.181176385	-0.07895008	0.319856607	-0.07895008	0.319856607

Izvor: izrada autora

Prilog 5. Rezultati regresijske analize između vanjskog migracijskog salda kao nezavisne varijable i BDP-a Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine

Regression Statistics								
Multiple R	0.873738181							
R Square	0.76341841							
Adjusted R Square	0.716102092							
Standard Error	755.0260505							
Observations	7							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	9197622.029	9197622.029	16.13435788	0.010153305			
Residual	5	2850321.685	570064.337					
Total	6	12047943.71						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	29526.12258	7582.299047	3.894085738	0.011477521	10035.20237	49017.04278	10035.20237	49017.04278
X Variable 1	-0.262602518	0.065376707	-4.016759625	0.010153305	-0.430658695	-0.094546342	-0.430658695	-0.094546342

Izvor: izrada autora

Prilog 6. Rezultati regresijske analize između vanjskog migracijskog salda kao nezavisne varijable i BDP-a po stanovniku Grada Zagreba kao zavisne varijable u razdoblju od 2011. do 2017. godine

Regression Statistics								
Multiple R	0.833556307							
R Square	0.694816117							
Adjusted R Square	0.633779341							
Standard Error	3181.312399							
Observations	7							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	115210200	115210200	11.38356507	0.019804175			
Residual	5	50603742.89	10120748.58					
Total	6	165813942.9						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	142441.5197	1462.626249	97.387504	2.1642E-09	138681.7192	146201.3202	138681.7192	146201.3202
X Variable 1	-3.092352547	0.916536686	-3.373953922	0.019804175	-5.448385104	-0.73631999	-5.448385104	-0.73631999

Izvor: izrada autora



CREATING A COMPETITIVE ADVANTAGE: NEW CHALLENGES AHEAD

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Abstract: *Competitiveness is a central issue of a growing open, interconnected and integrated global economy, but it is not yet uniquely defined. There are many factors that determine competitiveness, and they change with the development of globalization, and even today, under the conditions of Industry 4.0. The coronavirus (COVID-19) pandemic has also provoked a situation in which both policies to foster competitiveness need to be adapted. In order to achieve competitiveness, countries must create factors and develop policies that will create the conditions for better positioning in the global market. In order to successfully integrate into new markets, but at the same time highlight and continue economic development, reevaluation of competitiveness determinants, as well as past positioning strategies, is necessary. The paper analyses the theoretical settings and determinants of competitiveness, as well as the challenges of today that economies should respond to. Understanding new features of the competitiveness can help policymakers develop approaches for enhancing their economic performance.*

Keywords: *competitiveness; determinants; Industry 4.0; COVID-19; policy.*

JEL classification: *F00, F6, L2.*

INTRODUCTION

Competitiveness, although a rather vague term, represents a central objective of national policies (Liu, 2017). Globalisation has radically altered the nature of competition and it is generally recognized that, with the globalisation of the economy, competitiveness has become one of the prime concerns of governments and firms (Hatzichronoglou, 1996). As Gandotra (Gandotra, 2010) stated in an open economy, business performance depends upon the competence of creating and sustaining the competitive advantage, and it is the technological progress that has been

the engine of the development since the beginning of civilization (Sima, Gheorghe, Subić, & Nancu, 2020).

There are challenges in definition the term of competitiveness, due to the fact that there are different levels of competitiveness, many stakeholders, as well there are continuous changes on the market and technologies that are difficult to capture. Also, emerging of the technologies of the Fourth Industrial Revolution, as well as actual COVID-19 pandemic has posed new challenges for companies and countries to compete.

The aim of this paper is to discuss issues on competitiveness and gaining and maintaining competitive advantages today, in a globalise world, in terms of Fourth Industrial Revolution and COVID-19 pandemic.

The paper is organized in four sections. Section 2 summarizes the theoretical background and gives an overview of previous researches. Section 3 introduces issues of the Fourth industrial Revolution in the context of competitiveness. The final section presents conclusions.

LITERATURE REVIEW

There is a lack of consensus on the definition of competitiveness (Ketels, 2016). Interestingly, Martin (Martin, 2003) states that term competitiveness is widely used, and often abused. Krugman (Krugman, *Competitiveness: A Dangerous Obsession*, 1994) is one of the theorists that claimed the concept of competitiveness to be meaningless. He stressed that it is much easier to define competitiveness at company level than at the country level because countries do not compete with each other in the same way as businesses. Moreover, in his later works, Krugman (Krugman, *Making sense of the competitiveness debate*, 1996) points out that debates on competitiveness are essentially differently the issues of the theory of international trade. As a complex, multidimensional and multilevel concept, competitiveness has become a central issue of a growing open, interconnected and integrated global economy (Ogrean & Herciu, 2010). The evolution of this debate has traditionally oscillated about four ideas: labour division and specialisation, market share, costs/prices and productivity (Siudek & Zawajska, 2014).

While globalisation has strengthened the global economy and improved prosperity in general, the literature highlights the potential distribution of these benefits, which are unequal among many countries (Guinigundo, 2018).

Competitiveness can be discussed and evaluated at different levels, country level, industry level and a firm level. National competitive power is defined as the country's ability, under free market conditions, to increase the real income of its citizens and produce goods and services in accordance with conditions and standards on international markets (Akis, 2015). Momaya (Momaya, 1998) analysed international competitiveness on the industrial level, on the sample of construction industries in three countries: Japan, Canada and the United States, and confirmed the importance of the strategic management processes in reaching and maintaining competitiveness at the industry level. On the other side, Liu (Liu, 2017) points out the necessity for comprehensive approach to competitiveness, since competitiveness theories at all levels, including all microeconomic and macroeconomic determinants are closely related.

Sources of comparative advantages are broad and getting broader each day. Also, hierarchical order is changing too. Pietersen (Pietersen, 2010) on the other hand claims that competitive advantage is tangible and can be evaluated.

Aiginger et al. (Aiginger, Bärenthaler-Sieber, & Vogel, 2013) relate competitiveness with welfare, defining it as ability of country to perform beyond GDP. Having this point of view, they measure competitiveness through three different pillars: (1) income, (2) social and (3) ecological. In defining determinants of the competitiveness, they focus on price competitiveness (factor costs and productivity), as well as quality competitiveness (structure of production and exports and country capabilities which deal with innovation, education, institutions, ecology and social system).

Wen-Cheng et al. (Wen-Cheng, Chien-Hung, & Ying-Chien, 2011) consider technology innovation and organizational structure as main sources of competitive advantages. The key to successfully competing in the global market, facing many global challenges and achieving sustainable development, is certainly innovation (Bilas & Franc, *Inovacije i razvoj*, 2018). This is why innovation capacity, openness, diversification and specialisation are the most important tools for achieving competitiveness in complex and continuously changing globalisation conditions. Hchaichi and Ghodbane (Hchaichi & Ghodbane, 2014) consider also innovation a key factor of achieving and maintain competitiveness.

Stonehouse and Snowdon (Stonehouse & Snowdon, 2007) in interpreting Porter's work conclude that firm's value chain is necessary for generic strategy to be efficient and provide results. The role of successful value chain is in supporting this generic strategy to add value to firm's products and services, value which is higher than those of competitors.

Dwyer and Kim (Dwyer & Kim, 2003) differ three different directions of economic thoughts in defining and analysing competitiveness. In their opinion (1) economists put an accent on the price as a key determinant of competitiveness, (2) researchers from the area of management and strategy put an accent of firm-specific characteristics and (3) theorists from areas of sociology and political economy put accent on various social, political and cultural determinants of competitiveness. On the other hand, Delgado et al. (Delgado, Ketels, Porter, & Stern, 2012) found that competitiveness debate went around three factors: (1) market share, (2) costs and (3) productivity.

Most attempts to explain competitiveness in terms of prices are not considered to be enough (Hchaichi & Ghodbane, 2014). There are different non-price determinants that should be taken into consideration too.

Factors and policies that affect competitiveness are the business environment, economic and technological infrastructure, education, entrepreneurship, creativity and innovation (Duspara, Knežević, & Turuk, 2017). There are different sources of competitiveness in a wide range of industries, so called industry specific.

Delgado et al. (Delgado, Ketels, Porter, & Stern, 2012) defined foundational competitiveness as the "expected level of output per working-age individual that is supported by the overall quality of a country as a place to do business". In their definition they focus on broader national productivity, output per potential worker, and not usual measure of output per current worker. In their framework they differ microeconomic from macroeconomic competitiveness. According to their findings, microeconomic competitiveness is focused on specificities of the national business environment,

while macroeconomic competitiveness is focused on general preconditions that create opportunities for higher productivity, as they defined foundational competitiveness via productivity.

Ketels (Ketels, 2016) also puts accent on endowments that affect how the macro and microeconomic factors amendable to policy action translate into prosperity.

Porter (Porter, 1990) considers that differences in competitiveness levels between countries lie in the differences within and between the diamonds of national competitive advantages having four determinants: (1) factor conditions (e.g. availability of an educated workforce), (2) demand conditions (domestic demand for products and services), (3) related and supportive industries, and (4) the strategy, structure and rivalry of businesses. These determinants create a national environment in which companies create and learn to compete. Each point of diamond and diamond as a system affects the basic determinants of international success.

Ma (Ma, 2004) organizes competitive advantages in four main groups, and calls them a 4C model: (1) creation and innovation, (2) competition, (3) cooperation and (4) co-option. One of the framework models is consisted of three levels: (1) policy inputs which represent factors that policy can directly influence, (2) essential conditions which result from policy inputs and represent conditions under firm compete in a certain environment/country and (3) ultimate policy objective, which is sustainable growth (Ketels, 2016). This objective is not directly influenced by policymakers, but is influenced by the previous two levels.

Martin (Martin, 2003) summarised direct or indirect reflections on competitiveness by major schools of economic theory: classical theory; neoclassical theory; Keynesian economic theory; development economics; new economic growth theory and new trade theory. According to these theories, implications for competitiveness differ. Classical theory is based on theories of absolute and comparative advantages and the source of advantages is represented by differences in relative productivity among countries. If productivity is the same among countries, there is no basis for mutually beneficial trade. According to neoclassical theory, different proportions of factors of productions among countries represent a source of advantages. If factors proportions are same among countries, there is no basis for mutually beneficial trade. Interestingly, since the assumption of perfect competition, competitiveness is not considered to be relevant in the long run. According to Keynesian economic theory, capital intensity increases productivity and growth and assumption of imperfect markets allows differences among regions/countries. Also, governments can intervene successfully. According to development economics, regions with initial productive advantages are likely to maintain their lead and policies should promote convergence. On the other side, endogenous growth theory considers investments in research, development and innovations, as well as improving human capital as crucial for competitiveness. Finally, new trade theory put an accent on the size of the markets, specialisation, networks and economies of scale.

Similarly, Liu (Liu, 2017) theories of competitiveness on country level divides into four group of theories: (1) absolute and comparative advantages, (2) theories of international trade based on technology gap, (3) new trade theory and (4) diamond theory base on Porter's contributions. Theories which deal with competitiveness on the level of industries and firms, Liu (Liu, 2017) divides into resource-based theories

and new developments of these theories which include innovations and entrepreneurship.

Since competitiveness is a complex concept, a number of factors, the most appropriate way to assess the level of competitiveness is the use of multidimensional or composite competitiveness indicators (Siudek & Zawojaska, 2014).

McGee (McGee, 2014) claimed that the sustainability of competitive advantage depends on the maintaining the levels of resources relative to customers, catching-up, and productivity of research and development activities, market dynamics and reinforcing of existing advantages.

Today, global trade and manufacturing are increasingly structured around global value chains (Bilas, Bošnjak, & Novak, *Međunarodna trgovina – quo vadis?*, 2020). International fragmentation of production is a powerful source of increasing efficiency and competitiveness of businesses (OECD, 2012). Competitive strategies are based on integrating activities in the value chain (Ensign, 2001).

One of the ways to achieve competitive advantages for companies is to innovate services which help them to adjust to market trends and customers' needs and improve their market performance (Noorani, 2014).

In 2018, a new Global Competitiveness Index 4.0 was introduced (Global Competitiveness Index 4.0 - GCI 4.0), which is based on a different methodology. The index integrates past aspects with newly identified catalysts for productivity and economic growth, focusing on the role of human resources, innovation, resilience and agility, as factors defining competitiveness characteristics in Industry 4.0 (World Economic Forum, *The Global Competitiveness Report 2018*, 2018). The GCI 4.0 methodology is based on 12 competitiveness pillars: (1) institutions, (2) infrastructure, (3) ICT adoption, (4) macroeconomic stability, (5) health, (6) skills, (7) product market, (8) labour market, (9) financial system, (10) market size, (11) business dynamism and (12) innovation capability. The pillars of competitiveness are grouped into four groups: the enabling environment, human capital, markets and the innovation eco-system. Thanks to the new concept, the new index reveals the latest identified sources of productivity and long-term economic growth during the current industrial revolution, Industry 4.0.

COMPETITIVENESS IN THE ERA OF INDUSTRY 4.0

Term "Industry 4.0" was first used in 2011 to describe the government's high-tech strategy of the Republic of Germany, and today it refers to the Fourth Industrial Revolution - the emergence and diffusion of the spectrum of new digital industrial technologies. As Technology Industry 4.0, they are most commonly mentioned: The Internet of Things, Big Data and Analytics, Robotics, Artificial Intelligence and 3D Printing. Many of these digital technologies have been around for some time, but recent cost reductions and improvements in reliability allow for greater industrial application (Strange & Zucchella, 2017). The development and adoption of new technologies has accelerated dramatically in recent decades (UNCTAD, 2018).

The factors that determine competitive power have changed over time. Roughly, 15 to 20 years ago, quality and low production costs were important determinants of competing powers, but today the impact of these factors is diminishing. Today, competitive power is considered to be acquired by the ability to innovate and present improved products and/or services to the market before competitors (Akis, 2015).

Today, it is estimated that around 80% of world trade takes place within international production networks of multinational companies (World Trade Organization, 2018).

Industry 4.0 introduced a lot of changes, which affect competitiveness – structure of labor, innovation skills, health, institutions, financial system, education, macroeconomic variables (Bal & Erkan, 2019). Creative human capital is an accelerator in the process of developing and expanding Industry 4.0 (Kolesnichenko, Radyukova, & Pakhomov, 2019). A new set of technologies has already begun to penetrate global value chains and their impact will grow in the coming years (Lund, et al., 2019).

Deloitte (Deloitte, 2015) identified four main characteristics of the Industry 4.0: (1) vertical networking of smart production systems, (2) horizontal integration – new generation of global value chains, (3) through-engineering throughout the entire product life cycle and (4) acceleration through exponential technologies. The WEF (World Economic Forum, 2019) defines common success factors that can serve as the main principles of implementing the technologies of the Industry 4.0 in manufacturing to ensure competitiveness and sustainable growth: (1) systematic leadership, (2) collaborative innovation and (3) approach with the people at the centre.

Mainly, companies believe that digital transformation brought by Industry 4.0 will enable them to reach higher level of competitiveness (Deloitte, 2015). Also, Istomina et al. (Istomina, Vinogradova, Lukyanova, Dobrovolskaya, & Prodanova, 2020) confirmed in their research the key role for the digitalization in the modern economy and according to these results, creation of successful digital economy is considered to be a leading determinant for maintaining and developing international competitiveness.

Technologies are part of the solution to many of the complex global challenges of the 21st century. They are capable of taking society forward in an inclusive, sustainable and positive way, with an appropriate approach to their development (Philbeck, Davis, & Engtoft Larsen, 2018).

When discussing competitiveness in terms of challenges ahead, the impact of the COVID-19 pandemic cannot be neglected. According to the International Monetary Fund, global gross domestic product will contract by 3% in 2020, and some sectors experiences greater losses than others (International Trade Center, 2020). Lock-downs caused severe economic damage. This situation accelerated changes in business models and market trends.

International Trade Center (International Trade Center, 2020) defines four characteristics of the so called “new normal”: (1) resilience to change and unexpected shocks, (2) exploring all possibilities of digitalization, (3) prioritisation of inclusiveness and (4) focus on sustainable growth. A global supply chain breaks up the production process across countries (World Bank, 2020).

Firms specialize in a specific task and do not produce the whole product. The shutdown of factories due to the pandemic creates a chain reaction, affecting trade of other countries even if their manufacturing facilities are operational and borders are open to trade (World Bank, 2020) (International Trade Center, 2020).

It is a fact that Industry 4.0 change our understanding of the international competitiveness (Liu, 2017). Liu (Liu, 2017) provides a model of competitiveness in the area of Industry 4.0 using ecosystematic approach. The main logic of the model is that Industry 4.0 can impact competitiveness at all levels – nation, industry, firm through

both, microeconomic and macroeconomic drivers. According to the model, all relevant stakeholders should react in a systematically consistent way. There are five main points of the model according to which Industry 4.0 requires: (1) governments to provide innovation friendly institutions meaning promoting innovations, protection of the intellectual property rights, enabling business environment, adequate legal framework, etc., (2) strengthening factors of production through improvements in ICT, education and high skill workers, (3) development of the Internet of Things changes demand conditions, as well as, together with other technologies of the Industry 4.0 the way of functioning clusters and value chains, since customers are now closer to the production, (4) new strategies designed to take advantages of the Industry 4.0 and (5) understanding disadvantages of the Industry 4.0 like automation, disappearance of low-skill jobs, influence of blockchain and etc.

Manda and Dhaou (Manda & Dhaou, 2019) consider as drivers of the Industry 4.0: ICT and emerging technologies, education and training, innovation and responsive and context-specific strategies, while as most important challenges the following: potential job losses, skills challenges, infrastructure challenges, security and privacy.

According to UBS (UBS, 2016) there are significant implications of the industry 4.0 for the relative competitiveness of developed and emerging nations. Developed nations are considered to be relative winners, while emerging nations can experience negative effects from mainly low-skill jobs replaced by automation in combination with limited technology infrastructure which limits their potential benefits of connecting closely and entering different networks. Generally, according to UBS (UBS, 2016) flexible economies will have more benefits from Industry 4.0, flexible in terms of labor markets, education, infrastructure, etc. Bongomin et al. (Bongomin, Nganyi, Abswaidi, Hitiyise, & Tumusiime, 2020) found that most of the countries developed strategic initiatives and therefore positively responded to Industry 4.0 challenges. Before the Industry 4.0 it can be stated that competitive advantage depended upon primarily cheap and skilled labor force. Sima et al. (Sima, Gheorghe, Subić, & Nancu, 2020) concluded that in the era of Industry 4.0 these competitive advantages fell behind, because labor force need to be highly qualified and adaptive.

Turel and Akis (Turel & Akis, 2019) claim that Industry 4.0 will change global competition environment. From that point of view, they propose, if a country wants to stay competitive, it needs to analyse all potential advantages and disadvantages of the Industry 4.0, country specific, as well as to prepare digital innovations, new business models and promote close cooperation of all national stakeholders because it is the collaborative advantage one of the main sources of the competitive advantages today.

CONCLUSION

Despite the fact there is no unified definition of the term competitiveness, as well as there are different levels at which competitiveness can be observed and different group of determinants influence competitiveness, achieving and maintain competitiveness is one of major policy concerns of most countries in the world. This paper examined and pointed out the implications of globalisation and Fourth industrial revolution/Industry 4.0 on competitiveness, mainly on the national level. It can be concluded that these implications require to be included in government's policy and strategy initiatives in order to ensure for countries to be competitive. The importance of these

changes is accented also by recently new approached and methodologies introduced to measure competitiveness in this new era, which include main features of globalisation and Industry 4.0 (i.e. Global Competitiveness Index 4.0). Another important factor is all changes on the market and business models determined by the coronavirus (COVID-19) pandemic. These all led to a conclusion that factors that determine the competitiveness have changed over time. There are new factors and determinants that should be taken into account in the contemporary competitiveness models. Acquiring competitive advantages today requires new business models, production processes and adaptation of education systems at all levels. Countries that are less prepared to adapt to these structural changes will underperform in their competitiveness. Further research may include more detailed countries case studies and empirical evidences from global companies and global value chains. It would be of great importance to provide theoretical models of competitiveness which will include the Fourth industrial revolution framework, as well as to provide empirical research on the impact of the Fourth industrial revolution on international competitiveness.

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UTICAJ TRANSFERNIH CIJENA NA PORESKU EVAZIJU

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Sažetak: *Zadnjih godina transferne (interne) cijene su postale predmet interesovanja mnogih teoretičara i regulatornih tijela, kako zbog utvrđivanja njihovih efekata na poslovanje, tako i zbog mogućnosti iskorištavanja poreske evazije. Temelji za funkcionisanje transfernih cijena dati su OECD-ovim smjernicama, a dalje razrađeni kroz nacionalne zakone o porezu i pravilnike za njihovu primjenu. Navedeni regulatorni okvir tretira sve relevantne subjekte, okolnosti i uslove formiranja transfernih cijena, identifikaciju i objašnjenje metodologije određivanja transfernih cijena, te pružanje objektivnih dokaza o primjeni načela nezavisnosti i određivanja drugih uslova u transakcijama između povezanih društava, a sve u cilju kako bi se onemogućila porezna evazija i dokazala primjena zakonskih propisa iz područja određivanja transfernih cijena. Zavino od autonomije odjela decentralizovanog subjekta, transferna cijena se formira pomoću metoda koje su svrstane u dvije grupe: klasične transakcijske metode ili metode transakcijske dobiti. Koja metoda će se primjeniti iz navedene dvije grupe zavisi od usvojene politike poslovnog subjekta. Svrha ovog rada je istražiti da li su transferne cijene u skladu s načelom tržišnosti, bez obzira na primjenjenu metodu obračuna. Cilj rada je eliminisati sve mogućnosti poreske evazije u transakcijama između društva matice i zavisnih društava unutar grupe. Da bi se postigli navedeni cilj i svrha postavljena je osnovna hipoteza rada koja glasi da primjena različitih metoda obračuna transfernih cijena utiče na visinu poreske osnovice. Dokazivanje navedene hipoteze će se izvršiti na primjeru iz prakse. Dobijeni rezultati mogu služiti kao osnov za opredjeljenje poslovnog subjekta za odgovarajuću metodu obračuna transfernih cijena. Pri ovome se isključuju individualni ciljevi poslovnog subjekta i primat data jednom od osnovnih ciljeva oporezivanja: postizanje učinkovitosti i pravednosti.*

Ključne riječi: *transferne cijene; poreska evazija; metode obračuna transfernih cijena; regulatorni okvir transfernih cijena.*

JEL klasifikacija: F38.

UVOD

Sa procesom globalizacije dolazi do ukрупnjavanja kompanija kroz poslovno povezivanje ili širenja mreže. Kao glavni razlozi takvih aktivnosti navode se potrebe tržišnog širenja i/ili racionalizacije troškova poslovanja. Međutim, često se ne ističe još jedan bitan razlog ukрупnjavanja, a to je minimiziranje poreskih obaveza, odnosno ušteda na porezima. To je naročito izraženo kod povezivanja poslovnih subjekata iz različitih poreskih jurisdikacija i složenije organizacione strukture u kojima nije lako utvrditi članstvo u povezanoj grupi i tako po oba osnova postoji mogućnost poreske evazije. Transfer dobara unutar grupe, između matice i podružnica, odnosno filijala, se vrši po internim cijenama, poznatijim pod nazivom transferne cijene. Uspostavljanje transfernih cijena nastaje u momentu kada matica ili jedna podružnica unutar matice isporuči dobra drugoj podružnici po cijenama koje se razlikuju od tržišnih. Strana koja je isporučila dobra stiče prihod, a strana koja je preuzela dobra evidentira trošak nabavke, što upućuje da međusobne transakcije unutar grupe utiču na nivo profita svakog subjekta unutar grupe. Navedeno implicira da se raznim šemama mogu seliti profiti iz jedne zemlje u drugu, preko članica grupe, i tako minimizirati porez na dobit kroz njegovo seljenje u zemlju sa najnižopj stopom poreza na dobit (tzv.poreski rajevi).

Druga mogućnost uštede na porezima u radu sa transfernim cijenama je smanjivanje osnovice za porez na dodatnu vrijednost, kroz smanjivanje razlike između transferne i tržišne cijene, koja je predmet oporezivanja.

Rad istražuje transakcije između članica povezanog društva, s ciljem utvrđivanja tržišnosti zaračunatih naknada, te provjere jesu li naknade u skladu s odredbama važeće regulative.

POJAM TRANSFERNIH CIJENA

Transferne cijene se „definiraju neutralno, kao cijene po kojima jedna organizacijska jedinica tereti drugu za obavljene transakcije, poput isporuke proizvode ili usluge, u praksi često poznate i kao interne cijene“ (Žunić Kovačević, 2018). Druga organizaciona jedinica, u tom slučaju, na primljenim proizvodima ili uslugama nastavlja dalju proizvodnju ili ih prodaje na eksternom tržištu (Horngren, Datar, & Foster, 2018). Transakcije se odvijaju između poslovnih subjekata, odnosno transnacionalnih kompanija koje su struktuirane od podružnica i matice (koja ima više od 50% glasačkih prava u podružnici). Poreske implikacije transfernih cijena se javljaju kod poslovanja matice i podružnica u različitim zemljama svijeta u kojima se primjenjuju različiti poreski propisi i različite poreske stope. U uslovima kada se poreske osnovice mogu interno prebacivati između podružnica u različitim zemljama, važno je definisati cijene određenih transakcija. Cijene treba da odgovaraju tržišnim cijenama, kako bi se spriječilo sticanje određene koristi na nivou grupe kroz transferisanje oporezivog profita u zemlje sa povoljnijom poreskom stopom. Utvrđene transferne cijene impliciraju trošak nabavke jednog odjela ili članice i istovremeno prihod drugog odjela ili članice grupe. To upućuje da se sa transfernim cijenama može značajno uticati na profitabilnost svakog subjekata unutar složene grupe, bez obzira na način kako su one formirane (Templar, 2005).

Transferi između povezanih društava ne uključuju samo sirovine, materijal, proluproizvode, proizvode, robu i usluge, nego i alokaciju fiksnih troškova, kredite, naknade, nematerijalnu imovinu i slično. (Radebaugh & Gray, 2002)

Politika transfernih cijena, pored na visinu porez na dobit, utiče i na visinu poreza na dodatnu vrijednost, zbog čega nadležni poreski organi moraju donijeti propise prema kojima će poreski obveznici utvrditi svoju poresku politiku za transferne cijene kako bi se spriječile poreske manipulacije i izbjeglo dvostruko oporezivanje (Tucaković, 2010).

Primjeri transfernih cijena:

1. Prenos udjela sa povezanog lica na osnivača (fizičko lice) bez naknade. Oporeziva osnovica u tom slučaju je razlika između stvarne vrijednosti transakcije sa povezanim licem i tržišne vrijednosti, tj. poreska osnovica se uvećava za vrijednost prenesenog udjela.
2. Prenos nekretnine na povezano lice bez naknade, poslije čega slijedi prodaja uloga stranom ulagaču.
3. Pozajmljivanje sredstava od strane podružnice prema matici uz nižu kamatnu stopu od tržišne. U poreskom bilansu se iskazuje oporeziva dobit u vrijednosti između viših tržišnih i stvarnih vrijednosti transakcija između povezanih lica
4. Pozajmljivanje sredstava od strane matice prema podružnici uz višu kamatnu stopu od tržišne. Utvrđena razlika ima tretman transferne cijene - dividende.

REGULATORNI OKVIR ZA TRANSFERNE CIJENE

Važna odrednica u radu sa transfernim cijenama je ispitati da li postoje pokušaji poreske evazije u poslovanju s povezanim društvima u zemlji ili inostranstvu. S tim u vezi, utvrđen je okvir za transferne cijene kroz sljedeću regulativu:

- smjernice OECD-a (Organizacije za ekonomske odnose i razvoj) o transfernim cijenama (Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations, 2020),
- kodeks o dokumentaciji o transfernim cijenama za povezana društva u EU,
- nacionalni zakoni o porezu na dobit i pravilnici za njihovu primjenu.

Zemlje EU, kao i njeni budući kandidati, su obavezni ugraditi smjernice OECD-a u svoje nacionalne zakonske propise kako bi osigurale jedinstven tretman transfernih cijena na međunarodnom nivou (Perčević, 2015).

OECD-ove smjernice imaju za cilj da standardizuju i usklade regulativu na nivou EU, mada je zemljama članicama ostavljena sloboda da konkretnije regulišu transferne cijene. Nivo usklađenosti regulative je određen sljedećim parametrima:

- nivoom uključenosti OECD-ovih smjernica u zakonske okvire transfernih cijena,
- primjenom metode određivanja transfernih cijena,
- primjenom i regulacijom naprednih cjenovnih sporazuma i
- dodatnim zahtjevima za dokumentaciju o transfernim cijenama.

Republika Hrvatska je, u sklopu Zakona o porezu na dobit i Pravilnika o porezu na dobit, regulisala transferne cijene između povezanih lica (Pravilnik o porezu na dobit).

Povezane osobe (društva) u Republici Hrvatskoj definirane su članom 13. stavkom 2. Zakona o porezu na dobit, članom 41. Općeg poreznog zakona (dalje: OPZ) (Opći porezni zakon) i članom 9. OECD-ovog modela ugovora o izbjegavanju dvostrukog oporezivanja. U članu 13. stavku 2. Zakona o porezu na dobit, definirano je „da se povezanim osobama smatraju osobe kod kojih jedna osoba sudjeluje izravno ili

neizravno u upravi, nadzoru ili kapitalu druge osobe, ili iste osobe sudjeluju izravno ili neizravno u upravi, nadzoru ili kapitalu društva.” (Zakon o porezu na dobit)

Prema članu 13. stavku 1. Zakona o porezu na dobit propisano je „da ako se između povezanih osoba u njihovim poslovnim odnosima ugovore takve cijene ili drugi uvjeti koji se razlikuju od cijena ili drugih uvjeta koji bi se ugovorili između nepovezanih osoba, tada se sva dobit u svoti u kojoj bi bila ostvarena, kad bi se radilo o odnosima između nepovezanih osoba, uključuje u poreznu osnovicu povezanih osoba.” (Zakon o porezu na dobit)

Članom 41. OPZ-a definisano je „da će se ugovori i poslovni odnosi između povezanih osoba porezno priznati samo onda ako bi i druge osobe koje nisu u takvom međusobnom odnosu pod istim ili sličnim okolnostima utvrdile takve ugovorne uvjete ili uspostavile takve poslovne odnose.” (Opći porezni zakon)

Povezane osobe u smislu ovog Zakona su “pravno samostalna društva kod kojih jedno društvo u drugom društvu ima izravno ili neizravno više od 50% udjela ili ima izravno ili neizravno većinska članska prava.” (Opći porezni zakon)

Prema članu 9. paragraf 1a) i 1b) Modela porezne konvencije OECD-a, “dva poduzeća smatraju se povezanim ako jedno od njih izravno ili neizravno sudjeluje u upravi, kontroli ili kapitalu drugog ili ako iste osobe izravno ili neizravno sudjeluju u upravi, kontroli i kapitalu oba poduzeća.” (Tucaković, 2010)

U skladu s članom 1.42 OECD-ovih smjernica, analiza transfernih cijena bi se trebala, u načelu, temeljiti na svakoj izdvojenoj transakciji. Međutim, pretpostavka je da je prihvatljivo grupisati transakcije ako je visoka pouzdanost uporedbe tržišnih cijena i ako je predvidljivo da uporedba na grupnoj osnovi neće biti materijalno različita od takve analize svake pojedine transakcije.

U praksi, je prikladno grupisati one transakcije koje su povezane; npr., niz transakcija koji se odvija u uskoj vremenskoj vezi ili u slučaju paketnih dogovora.

METODE UTVRĐIVANJA TRANSFERNIH CIJENA

U računovodstvenoj praksi su zastupljene sljedeće tri metode utvrđivanja transfernih cijena:

1. tržišna metoda
2. troškovna metoda
3. pregovaračka metoda (Horngren, Datar, & Foster, 2018)

Tržišna metoda se može koristiti ukoliko su predhodno ispunjeni određeni kriteriji, od kojih su najvažniji sljedeći (Horngren, Datar, & Foster, 2018):

- postojanje perfektnog tržišta za proizvode ili usluge koje su predmet kupoprodaje unutar povezanog društva, bez mogućnosti uticaja bilo koje strane na formiranje cijene,
- minimalna međuzavisnost povezanost odjela u sklopu jednog subjekta ili članica povezanog društva, te
- da nema dodatnih troškova ili koristi na nivou grupe od kupoprodaje proizvoda ili usluga, bez obzira da li se oni kupuju na internom ili eksternom tržištu.

Kod određivanja transfernih cijena putem troškovne metode mogu se koristiti tri varijante a) na bazi ukupnih troškova, b) na bazi varijabilnih troškova i c) na bazi ukupnih troškova uvećanih za zaradu. Troškovna metoda se koristi u situacijama kada

nisu raspoložive tržišne cijene; kada tržišne cijene ne odgovaraju interesima učesnica povezane grupe; kada je pribavljanje transferne cijene skupo i sl.

Pregovaračka metoda se temelji na dogovorenoj (kompromisnoj) cijeni između odjela ili članova grupe, s tim da se kod pregovaranja mora raspolagati sa informacijama o tržišnim cijenama, kao i troškovima proizvoda koji su predmet kupoprodaje. Ova metoda se koristi kada postoji visoka autonomija odjela unutar poslovnog subjekta, kada tržišne cijene variraju i kada preovladava interes za ostvarenjem što veće operativne dobiti u odjelima ili članicama grupe.

Primjena bilo koje, od navedene tri, metode dovodi do različite dobiti odjela ili članova grupe, odnosno matice i zavisnog društva, a što se može vidjeti na primjeru koji slijedi (Aleksić & Vujnović Gligorić, 2019).

Slično, polazeći od preporuka sadržanih u Smjernicama OECD-a o transfernim cijenama, Europska komisija se bavila i konkretnim pitanjima metodologije transfernih cijena, koje se primjenjuju u sporazumima o transfernim cijenama. Ipak, čini se da se može primijetiti kako je dvadeseto stoljeće bilo obilježeno i izazovima u međunarodnom poreznom pravu, između ostalog, pitanjem i problemom kako podijeliti kod međunarodnog dohotka poreznu osnovicu, a upravo s obzirom na nepostojanje jedne više ili globalne vlasti. (Hyde, 2004)

Sporazumi o transfernim cijenama mogu se smatrati jednim tipom ili vrstom unutar šireg pojma obvezujućih mišljenja u poreznom pravu odnosno pravu javnih davanja. Povijesni prikazi razvoja obvezujućih mišljenja pronalaze ishodište u rimskom pravu. (Alarie, 2014)

Ipak, obvezujuća mišljenja posebnu pozornost privlače nakon 2013. godine, kada je Europska komisija započela posebnu istragu, zbog čega su države članice bile obvezne do kraja 2014. godine dostaviti Komisiji podatke o svim mišljenjima koja su donijele njihove porezne vlasti, i to za razdoblje od 2010. do 2013. godine. (Luja, 2015)

Obvezujuća mišljenja svoju pojavnost, praksu primjene i razvoja bilježe najprije u području carina i carinskog prava, pa je stoga preciznije reći da se sporazumi o transfernim cijenama razvijaju unutar poreznih (prethodnih) obvezujućih mišljenja (engl. advance tax rulings). (Advance Pricing Agreements, n.d.)

Primjer:

Proizvod A, zavisnog društva, se koristi kao osnovni materijal matice u proizvodnji proizvoda B. Da bi se proizveo jedan proizvod B potrebno je 0,50 jedinica direktnog materijala proizvoda A. Poznati su i sljedeći parametri:

- matica i zavisno društvo nemaju zaliha na početku i kraju poslovne godine,
- troškovi direktnog materijala po jedinici proizvoda matice iznose 5 KM/kg,
- ukupni fiksni troškovi matice iznose 12500 KM, a zavisnog društva 4000 KM,
- varijabilni troškovi po jedinici matice iznose 2,5 KM /kom, a zavisnog društva 2,5 KM/kg,
- prodajna cijena proizvoda matice je 12,5 KM, a zavisnog društva 5 KM/kg,
- kapacitet proizvodnje je 2500 kom proizvoda matice i 2500 kg proizvoda zavisnog društva,

- od ukupne proizvodnje proizvoda A, 2000 se prodaje na eksternom tržištu, a 500 komada na internom tržištu (isporučuje matici).

Potrebno je izračunati transferne cijene putem tržišne, troškovne i pregovaračke metode!

Rješenje:

Tabela 1. Računanje transferne cijene pomoću tržišne, troškovne i pregovaračke metode

Metoda	Tržišna metoda				Troškovna metoda				Pregovaračka metoda				Konsolidacija za sve tri metode
Opis	Matica	Zavisno društvo	Eliminacija		Matica	Zavisno društvo	Eliminacija		Matica	Zavisno društvo	Eliminacija		
			Dug.	Potr.			Dug.	Potr.			Dug.	Potr.	
Kapacitet	2500 kom	2500 kg			2500 kom	2500 kg			2500 kom	2500 kg			
Prihod	31250				31250				31250				41250
Interna prod.		2500	2500			2050	2050			2250	2250		
Eksterna prod.		10000				10000				10000			
Uk.prihod		12500				12050				12250			
Tr.direkt.mat.													3750
Uk.nabavka													
Inter.nabavka	2500			2500	2050			2050	2250			2250	
Eksterna nab.	3750				3750				3750				
Uk.dir.troš.mat	6250				5800				6000				
Varijabilni tr.	6250	6250			6250	6250			6250	6250			12500
Fiksni troš.	12500	4000			12500	4000			12500	4000			16500
Dobit	6250	2250			6700	1800			6500	2000			8500
Konsolid.dob.		8500				8500				8500			

Izvor: Prilagođeno prema (Aleksić & Vujnović Gligorić, 2019)

Iz priloženog rješenja se može vidjeti da način formiranja transferne cijene značajno utiče na profitabilnost svakog subjekata unutar složene grupe, dok konsolidovana dobit na nivou grupe ostaje ista. Navedeno upućuje na mogućnost prebacivanja profita, preko članica grupe, u zemlje sa najnižopj stopom poreza na dobit.

METODE UTVRĐIVANJA TRŽIŠNOSTI TRANSFERNE CIJENE

Zakon o porezu na dobit, u članu 13., stav 3., predviđa upotrebu jedne od sljedećih pet metoda, pri utvrđivanju i procjeni da li su poslovni odnosi između povezanih strana ugovoreni po tržišnim cijenama:

- metoda uporedivih nekontrolisanih cijena,
- metoda trgovačkih cijena,
- metoda dodavanja dobiti na troškove,
- metoda podjele dobiti i
- metoda neto dobiti.

Prve tri metode spadaju u klasične transakcijske metode, dok ostale dvije spadaju u metode transakcijske dobiti i smatraju se alternativnim metodama, tj. metodama koje se primjenjuju ukoliko se ne mogu primjeniti klasične transakcijske metode.

Navedene metode su propisane i OECD-ovim smjernicama. Kad je u pitanje izbor jedne od pet metoda za upotrebu, ključno je nekoliko faktora:

- temeljna analiza projekcija i izvršenih radnji,
- analiza sredstava i preuzetih rizika u vezi s tim transakcijama,
- konkluzija vezana za istovrsne transakcije i način njihova posmatranja,
- uporedna analiza i odabir najbolje metode za određivanje transfernih cijena transakcija između društava povezanog kapitala.

Metoda uporedivih nekontroliranih cijena ima prednost pred ostalim metodama u slučajevima kada je moguće provesti odgovarajuće uporedne analize.

Pri određivanju najprikladnije metode, trebaju se uzeti u obzir sljedeći faktori:

- nivo uporedivosti između kontrolisanih i nekontrolisanih transakcija i
- kvalitet podataka i pretpostavki.

Nivo uporedivosti procjenjuje se prema:

- karakteristikama imovine ili usluga koje se prenose,
- poslovima koje obavljaju strane i pretpostavljenim rizicima koji nastaju,
- ugovornim uslovima,
- ekonomskim okolnostima društva i
- poslovnim strategijama.

Kvalitet podataka i pretpostavki procjenjuje se na osnovu:

- cjelovitosti i ispravnosti podataka,
- pouzdanosti pretpostavki i
- osjetljivosti rezultata prema manjkavostima u podacima i pretpostavkama.

Hrvatski propisi, kao i OECD-ove smjernice, ne zahtijevaju odabir više od jedne metode za određivanje metode transfernih cijena.

Metoda uporedivih nekontroliranih cijena

Metoda uporedivih nekontrolisanih cijena je metoda „po kojoj se cijene za prodane proizvode, robu ili usluge u kontroliranim poslovima uspoređuju s onima u nekontroliranim poslovima i usporedivim okolnostima“ (Zakon o porezu na dobit, član 13., stav 3.).

Primjena ove metode može se vršiti kroz interno i eksterno poređenje nekontrolisanih cijena. Interno poređenje se vrši poređenjem transferne cijene sa uvoznom ili izvoznom cijenom koju poreski obveznik obračunava nepovezanim licima. Pri tome, poreski obveznik mora dokazati da prodajom robe ili usluga u drugu zemlju ne dolazi do skrivenog transfera dobiti, već da je ona opravdana zbog različitih uticajnih faktora, poput:

- carine i ostalih dažbina koje plaća zemlja uvoznica,
- prilagođavanja karakteristika proizvoda potrebama zemlje uvoznice (ambalaža, sastav, kvalitet),
- prodaje robe van sezone,
- bržeg obrta robe pri izvozu u drugu zemlju,
- udjela na domaćem i stranom tržištu, itd.

Kod eksternog poređenja se vrši poređenje uvoznih i izvoznih cijena uporedivih proizvoda koje različiti poreski obveznici obračunavaju nepovezanim licima. Teškoće u primjeni ove metode se javljaju iz razloga što su cijene konkurenata poslovna tajna i teško se otkrivaju. Međutim poreski organi mogu, na osnovu svog autoriteta i položaja, pribaviti i ove cijene.

Metoda trgovačkih cijena

Pomoću metode trgovačkih cijena se „utvrđuje cijena po kojoj se roba nabavljena od povezanih osoba prodaje nepovezanim osobama. Tako utvrđena cijena umanjuje se za odgovarajuću bruto trgovačku maržu koja se može postići u postojećim tržišnim uvjetima. Dobiveni ostatak je cijena po kojoj je roba mogla biti nabavljena od nepovezanih osoba“ (Zakon o porezu na dobit, član 13., stav 3.).

Metodu trgovačkih cijena koriste distributeri trgovačke robe u nepromijenjenom stanju. Ova metoda procjenjuje da li je transferna cijena izračunata po načelu tržišnosti, s obzirom na bruto maržu u poređenju sa nekontrolisanim transakcijama. Metoda polazi od razlike između nabavne cijene od povezanog lica i prodajne cijene nepovezanim licu. Prodajna cijena se umanjuje za ostvarenu bruto maržu iz koje se pokrva prodajni i ostali poslovni troškovi, rizici poslovanja i ciljane dobit. Nezavisnom cijenom, u tom slučaju, se smatra iznos koji ostane nakon oduzimanja bruto marže i usklađenja za ostale troškove povezane za nabavkom robe.

Primjena ove metode može se, takođe, može vršiti kroz interno i eksterno poređenje nekontrolisanih cijena. Veći nivo uporedivosti se može postići primjenom internih trgovačkih cijena tj. ako se vrši analiza primjene između kontrolisanih i nekontrolisanih prodaja od strane istog distributera. Ukoliko se ne može provesti interno poređenje uporedivih transakcija, tada se primjenjuje metoda eksternih trgovačkih cijena, tj. kroz poređenje nekontrolisanih transakcija drugih distributera.

Metoda trgovačkih cijena, uglavnom, ne nudi tačne rezultate iz razloga postojanja razlika u proizvodima, nivou tržišnosti proizvoda i usluga, rizicima, i sl.

Metoda dodavanja dobiti na troškove

Metoda dodavanja dobiti na troškove je metoda „po kojoj se prvo utvrđuju troškovi proizvoda, poluproizvoda ili usluga koje je imala osoba koja je proizvode, poluproizvode ili usluge prodala drugoj povezanoj osobi. Na tako utvrđene troškove dodaje se odgovarajuća bruto dobit koja se može postići u postojećim tržišnim uvjetima. Tako dobiveni iznos je cijena po kojoj su proizvodi, poluproizvodi ili usluge mogli biti nabavljeni od nepovezanih osoba (Zakon o porezu na dobit, član 13., stav 3.).

Metoda dodavanja dobiti na troškove polazi od troškova koji nastaju kod dobavljača, u kontrolisanim transakcijama između povezanih lica, na koje se dodaje odgovarajuća marža kako bi se ostvarila određena dobit s obzirom na funkcije i tržišne uslove. Prema smjernicama OECD-a potrebno je uporediti dobit koju ostvaruje povezano lice u kontrolisanim transakcijama s onom koju ostvari neko treće lice u nekontrolisanim transakcijama.

Tačnost ove metode se smanjuje ukoliko postoji materijalna razlika između nekontrolisanih i kontrolisanih transakcija u odnosu na proizvode, poslovno iskustvo, prirodu poslovanja, strukturu troškova i sl.

Metoda podjele dobiti

Pomoću metode podjele dobiti „se eliminira učinak posebnih uvjeta na dobit u poslovima između povezanih osoba. Ova eliminacija provodi se utvrđivanjem podjele dobiti koju bi nepovezane osobe očekivale sudjelovanjem u jednom ili više poslova. Po metodi podjele dobiti, najprije se utvrđuje podjela dobiti između povezanih osoba u jednom ili više poslova u kojima te osobe sudjeluju. Nakon toga procjenjuje se po-

djela dobiti do koje bi došlo da su u poslu u postojećim tržišnim uvjetima sudjelovale nepovezane osobe te se tako utvrđeni udjeli u dobiti raspoređuju na povezane osobe“ (Zakon o porezu na dobit, član 13., stav 3.).

Metoda podjele dobiti se koristi kada povezana društva zajednički stvaraju ili unose nematerijalnu imovinu. Metoda podjele dobiti prvo identifikuje zajedničku dobit (ukupna dobit iz transakcija ili ostatak dobiti koja se ne može odmah dodijeliti određenoj strani) koja se dijeli između povezanih društava u kontrolisanim transakcijama povezanog društva. Osnov za podjelu dobiti može biti ekonomski važeća osnova, koja odgovara principima podjele koja bi se desila u nezavisnom dogovoru.

Prednost ove metode je što se ona može koristiti i kada ne postoje uporedive transakcije nezavisnih društava sa transakcijama povezanih društava. U tom slučaju se raspodjela dobiti vrši na osnovu prakse u nepovezanim društvima.

Metoda neto dobiti

Metoda neto dobiti je metoda „po kojoj se ispituje ostvarena neto dobit u odnosu na neku osnovu kao što su ukupni troškovi, prihodi od prodaje, imovina ili vlastiti kapital koju jedna osoba ostvaruje u poslovima s jednom ili više povezanih osoba. Tako ostvarena neto dobit uspoređuje se s neto dobitkom sličnih osoba u sličnim okolnostima“ (Zakon o porezu na dobit, član 13., stav 3.).

Metodu neto dobiti koriste društva koja imaju, i proizvodnju, i distribuciju. Metoda neto dobitka upoređuje neto maržu, koju društvo ostvaruje u odnosu na pripadajuću osnovicu, sa neto maržom nezavisnih uporedivih društava. Slična je metodi dodavanja dobiti na troškove i metodi trgovačkih cijena, s osnovnom razlikom što umjesto bruto marže koristi neto maržu. Neto marža se stavlja u odnos sa osnovicom (troškom, imovinom, prodajom) i tako dobijeni pokazatelj se poredi sa finansijskim pokazateljima nezavisnih društava.

Positivna strana ove metode je u manjoj osjetljivosti na razlike koje utiču na uporedive transakcije (razlike u proizvodstvu, rizicima, tržišnosti proizvoda, funkcijama, korištenoj imovini i sl.). Nasuprot tome, zbog uticaja raznih ekonomskih faktora, ova metoda može dati rezultate koji su nepovezani sa stvarnom maržom u ostvarenim transakcijama sa povezanim licima

KLASIFIKOVANJE I IDENTIFIKOVANJE TAČNOSTI KOMPARATIVNIH VELIČINA

U Smjernicama OECD-a sugerise se prihvatanje bilo kojeg postupka iznalaženja rješenja za klasifikovanje i identifikovanje tačnosti komparativnih veličina, jer tačnost polučениh rezultata procesa ima veću vrijednost od samog procesa (završetak redosljednih pojedinačnih dijelova procesa ni u kojem slučaju ne sugerise rješenje kompatibilno s nezavisnim tržišnim načelom, što znači da neprovođenje procesa ne daje sigurnost da rezultat neće biti prilagođen tržištu).

Kada govorimo o procesu ovakve vrste, ne govorimo o njegovoj linearnosti, nego o svrhovitosti analitike uporedivosti i samih faktora analitike, te je sam proces sačinjen od devet koraka, kako slijedi: (koraci 4 – 7 mogu se više puta ponoviti), a to su:

1. **određivanje razdoblja**, odnosno godina koje će obuhvatiti analiza uporedivosti,
2. široko postavljena **analiza okolnosti** u kojima djeluje obveznik poreza, ana-

liziranje grane u kojoj djeluje, konkurencije, ekonomskih faktora koji utječu na obveznika, te okruženje u kojem posluje,

3. proučavanje i **razumijevanje povezanih transakcija** koje proučavamo (jer se temelji posebno na funkcijskoj analizi), omogućava izbor testne stranke (ako je to potrebno), najprimjerenije metode za određivanje transfernih cijena s obzirom na okolnosti slučaja, izbor finansijskih pokazatelja koji će se analizom provjeriti (u slučaju metode transakcijske dobiti) i identifikaciju bitnih faktora uporedivosti koje treba uzeti u obzir u analizi,

4. proučavanje mogućih **internih uporedivih veličina** (ako postoje),

5. **određivanje raspoloživih izvora informacija** u pogledu vanjskih uporedivih veličina, ako su takve vanjske uporedive veličine potrebne, uz uvažavanje njihove relativne pouzdanosti,

6. **izbor najprimjerenije metode za određivanje transfernih cijena** i u skladu s izabranom metodom određivanje odgovarajućih finansijskih pokazatelja (npr. određivanje odgovarajućeg pokazatelja stope čistog dobitka u slučaju metode stope čistog dobitka),

7. **identifikacija potencijalnih uporedivih veličina**, određivanje bitnih karakteristika koje bi trebala ispunjavati bilo koja transakcija između nepovezanih osoba da bi na osnovi odgovarajućih faktora, određenih u 3. koraku i u skladu s faktorima uporedivosti, bila prihvaćena kao potencijalna uporediva veličina,

8. **određivanje i provedbe prilagodbe uporedivih veličina**, gdje je to potrebno i

9. **interpretacija i upotreba prikupljenih podataka**, te utvrđivanje nezavisne tržišne naknade.

Najvažniji dio analize rizika je analiza rezultata poslovanja poreznog obveznika više godina (konkretno, da li su ostvareni rezultati preniski s obzirom na profitabilnost djelatnosti i profitabilnost grupe?). Naglasak je na izračunu EBIT-a (Earning Before Interesting and Taxes), tj. operativnog rezultata koji se izračunava tako da se prihodi od prodaje umanjuju za trošak prodane robe i operativne troškove (opšti, administrativni, prodajni).

U samoj pripremi dokumentacije za potrebe dokumentovanja nepristrane cijene obavljaju se i sljedeće radnje:

- prikupljaju informacije o i provedba analize uporedivosti transakcija,
- provođenje analize rizika i potrebne imovine za izvršenje transakcije,
- prikupljanje i obrada podataka o ugovornim uvjetima i
- provjera druge dokumentaciju relevantne za utvrđivanje transfernih cijena.

Glavni cilj strogih kontrola transfernih cijena obuhvaća sve relevantne subjekte, okolnosti i uslove formiranja transfernih cijena, identifikaciju i objašnjenje metodologije određivanja transfernih cijena, te pružanje objektivnih dokaza o primjeni načela nezavisnosti i određivanja drugih uslova u transakcijama između povezanih društava, a sve u cilju kako bi se onemogućila porezna evazija i dokazala primjena zakonskih propisa iz područja određivanja transfernih cijena.

ZAKLJUČAK

Zadnjih decenija je izražen talas koncentracije poslovnih subjekata u veće grupacije, a sve iz razloga suočenja sa visokim cijenama na svjetskom tržištu i pada tržišnog udjela. Takve tendencije se povećavaju sa padom konkurentnosti evropskih kompanija u odnosu na konkurentnost kompanija iz razvijenih dijelova svijeta, koja je posljedica pada produktivnosti, posebno u oblasti proizvodnje sirovina. U EU-i dolazi do visoke koncentracije kapitala u okviru industrijskih grana, tako da se po tom osnovu javlja nekoliko vodećih kompanija, sa podružnicama širom svijeta. Sve finansijske transakcije između društava povezanog kapitala u zemlji i inostranstvu odvijaju se po transfernim cijenama. Budući da ne govorimo o nezavisnim poslovnim subjektima, time i njihovi bilateralni i višelateralni odnosi moraju biti regulisani transfernim cijenama, posebno u kontekstu multinacionalnih kompanija i njihovih međunarodnih poslovnih odnosa i utvrđivanja osnovice poreza na dobit u različitim državama u kojima posluju povezana društva. U skladu međunarodnim pravilima, uzanse o transfernim cijenama definisane od strane OECD-a su zapravo implementirane u nacionalna zakonodavstva koja regulišu sisteme poreza. Neadekvatno tretiranje ovog problema nosi rizik da se poreska osnovica transferiše u zemlje sa manjim poreskim opterećenjem. Alokacija poreske osnovice se vrši tako da povezana lica putem transfernih cijena, kroz precijenjivanja rashoda i/ili potcjenjivanja prihoda, prenose dio svoje poreske osnovice na teritoriji zemlje članice koja ima nižu stopu oporezivanja dobiti. Rizik gubitka prihoda od transfernih cijena je veći u slučaju kada u zemlji posluje više međunarodnih kompanija u obliku povezanih društava u zemlji, kao i društava u inostranstvu čiji su osnivači rezidenti iz zemlje. Od rizika gubitka prihoda od transfernih cijena nisu oslobođene ni kompanije koje posluju u okvirima same zemlje. U ovom slučaju je izraženo transferisanje poreske osnovice ka obvezniku koji je oslobođen plaćanja poreza na dobit. Utvrđivanje transfernih cijena nije eksplicitno određeno već su date određene smjernice kroz ponuđene metode, čiji izbor se temelji na detaljnim analizama i dogovorima učesnika. U radu su obrađene metode koje se koriste za formiranje transfernih cijena, iz kojih je vidljivo da su transferne cijene odraz više varijabli koje su različito struktuirane kod svakog poslovnog subjekta. Primjena različitih metoda obračuna transfernih cijena utiče na visinu poreske osnovice svakog poslovnog subjekta, čime je potvrđena osnovna hipoteza rada. Potpuno je jasno da izučavanje transfernih cijena nije egzaktno, te je u tom kontekstu odabir krajnjeg rješenja transferne cijene mora biti iz više mogućih rezultata, odnosno uporedivih tržišnih cijena. Iz toga možemo zaključiti da manje razlike iz više potencijalnih rezultata prejudiciraju veću pouzdanost upotrebe metode.

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INFLUENCE OF TRANSFER PRICES ON TAX EVASION

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Summary: In recent years, transfer (internal) prices have become the subject of interest of many theorists and regulators, both for determining their effects on business and for the possibility of exploiting tax evasion. The foundations for the functioning of transfer pricing are given in the OECD guidelines, and further elaborated through national tax laws and regulations for their application. This regulatory framework treats all relevant entities, circumstances and conditions of transfer pricing, identification and explanation of transfer pricing methodology, and providing objective evidence on the application of the principle of independence and setting other conditions in transactions between related companies, all in order to prevent tax evasion and proven application of legal regulations in the field of transfer pricing. Since transfer prices are linked to decentralized related business entities consisting of parent companies and branches (organizational units or centers of responsibility) operating in the same or another country, tax evasion is done through the transfer of profits from a country with a high tax burden to a country with a lower tax rate. In addition, tax evasion is performed by reducing the tax base for value added tax, which is the difference between the transfer (non-market) price and the market price. Transfer price is formed using methods that are classified into two groups: classical transaction methods or transac-

tion profit methods. Which method will be applied from these two groups depends on the adopted policy of the business entity. In principle, methods that are in line with the nature of the business of the business entity and that can determine the tax base in the most objective way should prevail. In practice, a method is chosen that results in maximizing profits and minimizing tax liabilities, which further leads to a better competitive position of the business entity, improvement of market position and increase of market shares. The subject of observation are all transactions between related parties on the basis of direct and indirect agreements, contracts, agreements and similar business relationships that affect the tax base, namely transactions with assets, services, financial transactions, capital transactions (purchase and sale of securities and shares) and other similar transactions. The purpose of this paper is to investigate whether transfer prices are in line with the principle of marketability, regardless of the applied calculation method. The aim of this paper is to eliminate all possibilities of tax evasion in transactions between the parent company and subsidiaries within the group. In order to achieve the stated goal and purpose, the basic hypothesis of the work is set, which states that the application of different methods of calculating transfer prices affects the amount of the tax base. Proof of this hypothesis will be done on a case study example. The obtained results can serve as a basis for the commitment of the business entity for the appropriate method of calculating transfer prices. This excludes the individual goals of the business entity and the primacy given to one of the basic goals of taxation: achieving efficiency and fairness.

Keywords: transfer prices; tax evasion; transfer pricing methods; regulatory framework of transfer pricing.

JEL classification: F38.



KRATKO ILI PRETHODNO SAOPŠTENJE / SHORT OR PRELIMINARY REPORT

UTICAJ FINANSIJSKE STRUKTURE KAPITALA NA PROCJENJENU VRIJEDNOST PREDUZEĆA

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Sažetak: U savremenom poslovnom okruženju pojava merdžera i akvizicija, prodaja preduzeća, kao i nestanak preduzeća sa tržišta su svakodnevna pojava. U tim, nazovimo ih, „transakcijama“ se javlja potreba da se utvrdi kolika je vrijednost preduzeća koje se pripaja drugom preduzeću, prodaje ili s druge strane koje nestaje sa tržišta odnosno koje ide u likvidaciju. Preduzeća koja su predmet tih „transakcija“ se razlikuju po brojnim kriterijumima. Jedan od tih kriterija je i struktura kapitala. Cilj istraživanja je utvrditi uticaj finansijske strukture kapitala na procijenjenu vrijednost preduzeća. Metode koje su korišćene za procjenu vrijednosti preduzeća su: metoda diskontovanja neto novčanog toka, kao metoda prinostnog pristupa, i metoda multiplikatora na osnovu uporedivih transakcija, kao metoda tržišnog pristupa. Uticaj strukture kapitala na procijenjenu vrijednost preduzeća, utvrđen je na osnovu regresione i korelacione analize. Rezultati koji su dobijeni primjenom metode multiplikatora na osnovu uporedivih transakcija, ukazuju na to da, sa povećanjem učešća pozajmljenog kapitala u sktukturi kapitala, procijenjena vrijednost preduzeća raste, što je u skladu sa Modeljani – Milerovom teorijom iz 1964.godine. Sa druge strane, rezultati koji su dobijeni primjenom metode diskontovanja neto novčanog toka su u skladu sa teorijom statičkog kompromisa. Uzimajući u obzir činjenicu neefikasanosti tržišta, može se zaključiti da će sa povećanjem učešća duga u kapitalu, procijenjena vrijednost preduzeća rasti do određenog nivoa tog leveridža, a nakon tog nivoa, vrijednost preduzeća će sa povećanjem učešća duga u kapitalu da se smanjuje.

Cljučne riječi: struktura kapitala; procjena vrijednosti; Modeljani – Milerova teorija; teorija Statičkog kompromisa.

JEL klasifikacija: G12, G32.

UVOD

Struktura kapitala je uslovljena brojnim faktorima, od rentabilnosti, sigurnosti povjerilaca, pa sve do finansijske elastičnosti. Svaki od tih faktora podrazumijeva

drugačiji odnos sopstvenog i pozajmljenog kapitala. Ako se posmatra faktor rentabilnosti, preduzeće treba da poveća učešće pozajmljenog kapitala, jer će po osnovu efekta poreskih ušteda imati veću rentabilnost kapitala. Sa aspekta sigurnosti povjerenilaca, preduzeće treba da smanji učešće pozajmljenog kapitala, budući da je visina sopstvenog kapitala dužnika garantna supstanca povjerenioca.

Problem optimalne strukture kapitala je bio, i jeste predmet brojnih istraživanja finansijske teorije i prakse. Samo pitanje optimalne strukture kapitala se svodi na dilemu da li se promjenom odnosa pozajmljenog i sopstvenog kapitala u strukturi može uticati na vrijednost preduzeća.

Shodno navedenom, problem istraživanja u ovom radu je definisan u vidu pitanja: Kakav je odnos između finansijske strukture kapitala i procijenjene vrijednosti preduzeća?

Uzimajući u obzir definisani problem istraživanja, glavna hipoteza glasi: Sa povećanjem učešća pozajmljenog kapitala, vrijednost preduzeća raste do određenog nivoa leveridža, a nakon tog nivoa sa daljim povećanjem leveridža vrijednost preduzeća se smanjuje.

U namjeri da se odgovori na istraživačko pitanje, te da se izvrši testiranje postavljene hipoteze, rad je strukturiran kako slijedi. U prvom dijelu daje se teorijski okvir istraživačkog problema, unutar kojeg se predstavljaju osnovne odrednice o strukturi kapitala, razlika između finansijske i kapitalne strukture kapitala, i daje se pregled dosadašnjih istraživanja i rezultata. Metodologija istraživanja je predstavljena u drugom dijelu rada. U posljednjem dijelu rada prezentovani su rezultati istraživanja.

KAPITALNA I FINANSIJSKA STRUKTURA KAPITALA

Preduzeća, kao privredno pravni entiteti, su osnovana radi obavljanja određene djelatnosti koja treba da zadovolji potrebe potrošača i kupaca i na taj način ostvare vrhunski cilj, maksimiziranje dobitka u dugom roku (Rodić J. F., 2008). Da bi bila u stanju da obave djelatnost zbog koje su osnovana, preduzeća trebaju da raspolazu finansijskim sredstvima na osnovu kojih će nabaviti sva potrebna sredstva za obavljanje date djelatnosti.

Kada je riječ o finansijskim izvorima preduzeća na raspolaganju imaju pozajmljene i sopstvene izvore finansiranja. Odnos između ova dva izvora finansiranja predstavljen je u pasivi bilansa stanja. Analizirajući pasivu bilansa stanja, može se govoriti o: finansijskoj strukturi kapitala i kapitalnoj strukturi.

Finansijska struktura kapitala je širi pojam od kapitalne strukture. Ona se odnosi na odnos koji postoji između sopstvenog kapitala i ukupnog pozajmljenog kapitala, što znači da obuhvata i kratkoročni i dugoročni pozajmljeni kapital (Učkar & Urti, 2015).

S druge strane, kapitalna struktura je uži pojam od finansijske strukture kapitala, a odnosi se na odnos koji postoji između sopstvenog kapitala tj. sopstvenih izvora finansiranja i pozajmljenih dugoročnih izvora finansiranja.

PREGLED TEORIJA STRUKTURE KAPITALA

Postoje različite teorije koje su pokušale i danas pokušavaju da objasne odnos koji postoji između strukture kapitala i vrijednosti preduzeća. Jedna, među prvim razvijenim teorijama strukture kapitala je svakako teorija irelevantnosti, poznatija kao MM teorija, odnosno Modiljani-Milerova (MM) teorija strukture kapitala.

MM teorija je razvijena 1958. godine od strane Modiljanija i Milera. Prema ovoj teoriji, kao što joj sam naziv ukazuje, odluke o strukturi kapitala su irelevantne za vrijednost preduzeća. To znači da je vrijednost preduzeća koje kao izvore finansiranja, pored sopstvenog kapitala, koristi i pozajmljeni kapital jednaka vrijednosti preduzeća koje se isključivo finansira iz sopstvenih izvora. To nas navodi na zaključak da prema MM teoriji ne postoji uticaj finansijskog leveridža na prosječnu ponderisanu cijenu kapitala, pa time niti na vrijednost preduzeća.

$$V_Z = V_N \quad (1)$$

Izvor: (Mikerević, Napredni strateški finansijski menadžement, 2010)

gdje je:

V_Z = vrijednost zadužene kompanije

V_N = vrijednost nezadužene kompanije

Zbog neodrživih pretpostavki na kojima je temeljena MM teorija, a među kojima je i ona da se apstrahuje porez na dobit, 1964. godine Modiljani i Miller u svoju teoriju uključuju i porez na dobit čime zapravo respektuju činjenicu da postoji veza između vrijednosti preduzeća i leveridža tj. nivoa zaduženosti. Naime, veći nivo zaduženosti uvećava vrijednost preduzeća zbog poreskih ušteda budući da su rashodi kamata, koji se plaćaju na pozajmljene izvore finansiranja odbitna stavka poreske osnovice – bruto dobitka (Mikerević, Napredni strateški finansijski menadžement, 2010).

$$V_Z = V_N + T_k * D \quad (2)$$

$$V_Z = \frac{EBIT (1 - T_k)}{k_0} + T_k * D$$

Izvor: (Mikerević, Napredni strateški finansijski menadžement, 2010)

gdje je:

T_k = stopa poreza na dobit

D = dug

k_0 = cijena sopstvenog kapitala kompanije koja ne koristi dug

Dakle, vrijednost zadužene kompanije je veća od vrijednosti nezadužene kompanije za iznos poreskih ušteda. Sadašnja vrijednost poreskih ušteda se računa prema sljedećem izrazu:

$$SV_{PU} = \frac{T_k * k_d * D}{k_d} \quad (3)$$

Izvor: (Mikerević, Napredni strateški finansijski menadžement, 2010)

Teorija prema kojoj postoji optimalan nivo zaduženosti, tj. takav odnos sopstvenog i pozajmljenog kapitala kojim se minimizira cijena kapitala, a maksimizira vrijednost preduzeća, je tradicionalna teorija strukture kapitala (Vidučić, 2001).

Teorija koja se razvila na osnovu kritike Modiljani-Milerove teorije je teorija statičkog kompromisa. Naime, sa uključivanjem poreza u svoju teoriju, Modiljani i Miler ne uzimaju u obzir troškove finansijskih neprilika niti tzv. agencijske probleme, koji takođe utiču na optimalnu strukturu kapitala preduzeća. Troškovi finansijskih neprilika dovode do rasta troškova duga u vidu više kamatne stope, kao cijene pozajmljenog kapitala. Shodno tome, dolazi se do zaključka da će vrijednost preduzeća koje koristi pozajmljene izvore finansiranja rasti sve dok efekat poreskih ušteda, koji se ostvaruje po osnovu rashoda kamata, premašuje troškove finansijskih neprilika (Mikešević, Napredni strateški finansijski menadžement, 2010).

U periodu od 1973. do 2002. ispituje se uticaj asimetričnih informacija na određivanje strukture kapitala za američke kompanije. (Bharath, Pasquariello, & Wu, 2009). Na osnovu dobijenih rezultata otkrivaju da asimetrične informacije utiču na strukturu kapitala, a time i na vrijednost preduzeća, što je u skladu sa teorijom signaliziranja (Ashiqur & Arifuzzaman, 2014).

Prema teoriji signaliziranja, kako navodi Mikešević, firme sa ekstremno dobrim izgledima preferiraju da se finansiraju dugom, a one sa slabim performansama više koriste finansiranje putem emitovanja akcija. Ovo iz razloga što po osnovu akcionarskog kapitala, kada se preduzeće nađe u fazi krize, nema nikavkih troškova, budući da se dividenda ne mora isplatiti akcionarima u datom trenutku, što nije slučaj i sa pozajmljenim izvorima finansiranja, po osnovu kojih se kamata mora platiti bez obzira na finansijske performanse dužnika.

METODOLOGIJA I REZULTATI ISTRAŽIVANJA

Metodologija istraživanja

Metode koje su korišćene za procjenu vrijednosti prduzeća su, kao što se vidi iz tabele broj jedan, metoda diskontovanja neto novčanog toka i metoda multiplikatora na osnovu uporedivih transakcija. Uticaj strukture kapitala na procenjenju vrijednost preduzeća, utvrđen je na osnovu regresione i korelacione analize. U tu svrhu identifikovane su zavisna i nezavisna varijabla. Zavisna varijabla je predstavljena preko procjenjene vrijednosti preduzeća (V), a nezavisna varijabla preko strukture kapitala, koja je predstavljena preko učešća duga u ukupom kapitalu i preko racija zaduženosti. Procjena je izvršena na dan 31.12.2019.godine.

Tabela 1. Varijable u istraživanju

Varijabla	Oznaka varijable	Vrsta varijable	Metoda procjene
Procjenjena vrijednost preduzeća	V	Zavisna	
Učešće duga u kapitalu	$\frac{D}{E + D}$	Nezavisna	Metoda diskontovanja neto novčanog toga
Racio zaduženosti	Rz	Nezavisna	Metoda multiplikaoatra na osnovu uporedivih transakcija

Izvor: izrada autora

Metoda multiplikatora na osnovu uporedivih transakcija podrazumijeva da se procjena vrijednosti preduzeća vrši na način da se izračuna odgovarajući multiplikator uporedivog preduzeća, a zatim da se on množi sa odgovarajućom ekonomskom varijablom procjenjivanog preduzeća (Pratt, 2008).

$$V_E = \text{Multiplikator}_{\text{uporedivog preduzeća}} * \text{Eko. varijabla}_{\text{procjenjivanog preduzeća}} \quad (4)$$

Kao multiplikator u ovom radu korišten je P/E racio, a kao ekonomska varijabla procjenjivanog preduzeća neto dobit.

Ova metoda je primjenjena na preduzeću *Mtel* a.d. Banja Luka – procjenjivano preduzeća, dok je *bhtelecom* d.d. Sarajevo uporedivo preduzeće. Za izračunavanje pokazatelja korišćeni su podaci iz finansijskih izvještaja navedenih preduzeća koji su preuzeti sa Banjalučke i Sarajevske berze. Uporedivo preduzeće je ono s novčanim tokovima, potencijalom rasta i rizikom sličnim kao kod preduzeća koje se procjenjuje (Damodaran, 2012). S druge strane Higgins pored navedenog dodaje strukturu kapitala (Higgins, 2009). Prema Rodiću i Filipoviću za postizanje uporedivosti potrebno je da preduzeća budu iz iste grane djelatnosti, da prodaju i nabavljaju na istom tržištu, da su povezana s drugim preduzećima, da su slične veličine i starosti te približnog finansijskog leveridža (Rodić & Filipović, 2010).

Kada je riječ o metodi diskontovanja neto novčanog toka, ona podrazumijeva da je vrijednost preduzeća jednaka zbiru diskontovane vrijednosti projektovanog neto novčanog toka i rezidualne vrijednosti (Mikerević, Principi i praksa procjene vrijednosti preduzeć, 2009).

$$V = \frac{\sum_{t=1}^{t=n} NNT}{(1 + k_c)^t} + \frac{RV}{(1 + k_c)^t} \quad (5)$$

gdje je:

NNT = očekivani neto novčani tok

k_c = diskontna stopa,

RV = rezidualna vrijednost

Očekivani neto novčani tok, odnosno projekcija neto novčanog toka izvršena je na osnovu prosječne stope rasta u periodu od 2013 – 2019. godine, a procjena je urađena za period od 2020 – 2029. godine.

Rezidualna vrijednost je utvrđena primjenom sljedeće formule (Mikerević, Principi i praksa procjene vrijednosti preduzeć, 2009)

$$RV = \frac{DNNT}{(DS - SRr)} \quad (6)$$

gdje je:

DNNT = sadašnja vrijednost neto novčanog toka iz posljednje godine projekcije,

DS = diskontni faktor,

SRr = stopa rasta u rezidualu.

Navedena metoda je primjenjena na sljedećem primjeru.

Preduzeće „X“ a.d. Banja Luka vrši procjenu vrijednosti preduzeća „Z“ a.d. Trebinje na dan 31.12.2019.godine. Procjenjivač je izvršio projekciju neto novčanog toka za narednih 10 godina odnosno za period od 2020 – 2029.godine. Kao diskontni faktor procjenjivač koristi prosječnu ponderisanu cijenu kapitala – wacc. Projekcija je prikazana u tabeli broj 2.

Tabela 2. Projektovani NNT preduzeća „Z“ a.d. Trebinje

Godina	Projektovani NNT u BAM
2020.	9,995,600
2021.	13,287,742
2022.	13,287,742
2023.	15,320,480
2024.	17,664,182
2025.	20,366,419
2026.	23,482,041
2027.	27,074,285
2028.	31,216,065
2029.	35,991,448

Izvor: izračun autora

Tabela 3. Diskontni faktor – wacc

Stopa poreza	Cijena duga	Cijena sop. Kap.	Učešće duga	WACC
10%	0	11%	0%	11.00%
10%	3%	11%	10%	10.17%
10%	3%	11%	20%	9.34%
10%	4%	12%	30%	9.48%
10%	5%	13%	40%	9.60%
10%	7%	15%	50%	10.65%
10%	9%	16%	60%	11.26%
10%	11%	18%	70%	12.33%
10%	12%	20%	80%	13.36%
10%	15%	23%	90%	14.45%
10%	15%	25%	100%	16.20%

Izvor: izračun autora

U tabeli broj 3 dat je prikaz ponderisane prosječne cijene kapitala, koja će biti korištena kao diskontna stopa pri utvrđivanju vrijednosti posmatranog preduzeća. Interesantno je primjetiti da sa povećanjem učešća duga u strukturi kapitala, wacc odnosno prosječna podnerisana cijena kapitala opada, a zatim raste, kakav će uticaj ta činjenica imati na procijenjenju vrijednost posmatranog preduzeća vidijeće se u narednom poglavlju.

REZULTATI ISTRAŽIVANJA I DISKUSIJA

U tabeli broj 4 predstavljeni su rezultati istraživanja primjenom metode multplikatora na osnovu uporedivih transakcija.

Tabela 4. Rezultati istraživanja – metoda multplikatora na osnovu uporedivih transakcija

Godina	P/E ratio 'bhtelecom	Neto dobit Mtel	Procjenjena vrijednost Mtel	Racio zaduženosti
2019.	10.282	80,747,468	830,215,460	92%
2018.	9.315	60,880,880	567,112,208	47%
2017.	8.295	56,302,896	467,039,128	27%
2016.	5.641	65,495,660	369,491,045	29%
2015.	6.530	76,326,331	498,446,091	30%

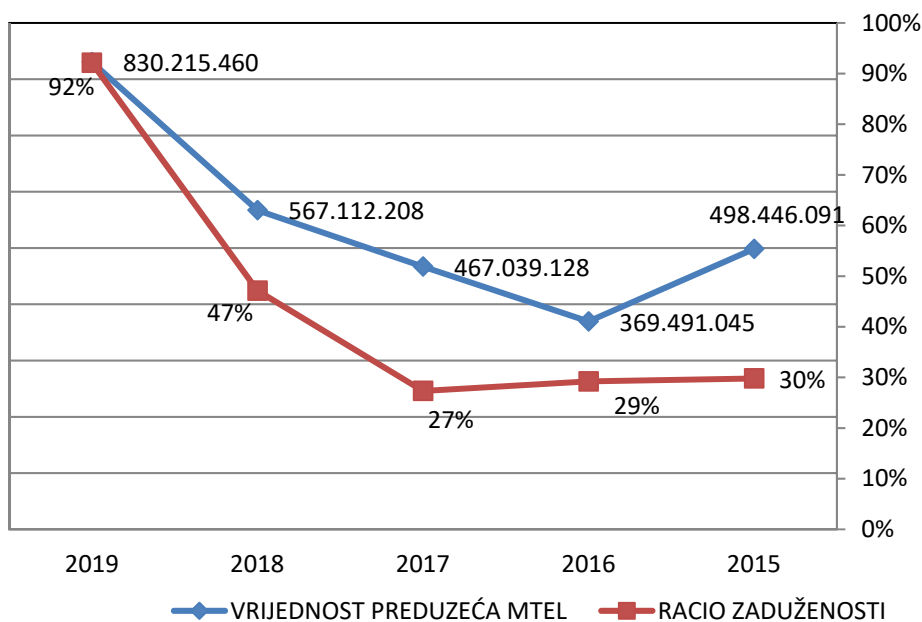
Izvor: izračun autora

Za izračun nezavisne varijable odnosno racija zaduženosti korišteni su podaci iz finansijskih izvještaja predmetnog preduzeća (Mtel). Navedeni izvještaji su preuzeti sa sajta Banjalučke berze. Formula putem koje je izračunat racio zaduženosti glasi:

Vrijednost pozajmljenih izvora finansiranja Vrijednost kapitala

(7)

Izvor: (Stevanović, 2010).¹



Grafikon 1. Odnos između vrijednosti preduzeća i racija zaduženosti

Izvor: izrada autora

Na osnovu podataka predstavljenih u tabeli broj 4, a što se vidi i sa grafikona broj 1, može se zaključiti da sa povećanjem racija zaduženosti dolazi do rasta procjenjene vrijednosti posmatranog preduzeća. Ovaj zaključak potvrđuje i izračunat koeficijent korelacije, koji iznosi 0.96042. Naime, u 2019.godini kada je ratio zaduženosti iznosio 92% procjenjena vrijednost posmatranog preduzeća bila je najviša, i iznosila je 830 miliona BAM. S druge strane u 2015.godini, kada je ratio zaduženosti iznosio 30%, vrijednost posmatranog preduzeća je iznosila 498 miliona BAM. Međutim, 2016. i 2017.godina odstupaju od prethodno iznesenog zaključka. Naime, u 2016. godini ratio zaduženosti je iznosio 29%, a vrijednost preduzeća je bila 369 miliona BAM, dok je u 2017.godini ratio zaduženosti iznosio 27% a vrijednost preduzeća je bila viša u odnosu na 2016. i iznosila je 467 miliona BAM. Ovo odstupanje ukazuje na to da procjenjena vrijednost preduzeća pored racija zaduženosti zavisi i od P/E racija uporedivog

¹ Pozajmljeni izvori finansiranja u navedenoj formuli čine: dugoročna rezervisanaj, dugoročne obaveze, kratkoročne obaveze kao i pasivna vremenska razgraničenja. S druge strane pod kapitalom se podrazumijeva neto vrijednost vlasničkog kapitala koja se dobija tako što se osnovnom kapitalu doda vrijednost emisije premije, rezervi iz dobitka, revalorizovanih rezervi i neraspoređenog dobitka, a zatim se od dobijenog iznosa oduzme vrijednost neuplaćenog upisanog kapitala, otkupljenih akcija i ukupnog gubitka iskazanog na dan bilansa.

preduzeća, što potvrđuje i koeficijent korelacije između ove dvije varijable koji iznosi 0.85327, dok je koeficijent korelacije između neto dobiti procjenjivanog preduzeća i procjenjene vrijednosti 0.61935, što znači da veći uticaj ima P/E ratio uporedivog preduzeća, što se može vidjeti iz tabele broj 5.

Tabela 5. Koeficijent korelacije

	P/E ratio bhtelecom	Neto dobit Mtel	Procjenjena vrijednost Mtel	Racio zaduženosti
P/E ratio bhtelecom	1			
Neto dobit Mtel	0.12557	1		
Procjenjena vrijednost Mtel	0.85331	0.61935	1	
Racio zaduženosti Mtel	0.78066	0.62232	0.96040	1

Izvor: izračun autora

S obzirom na to da najveći koeficijent korelacije postoji između procjenjene vrijednosti preduzeća i racija zaduženosti, dolazi se do zaključka da sa povećanjem racija zaduženosti dolazi do rasta procjenjene vrijednosti preduzeća. Ovakav zaključak je u skladu sa Modiljani- Milerovom teorijom iz 1964.godine, o kojoj je više riječ bilo u prethodnom poglavlju ovog rada, prema kojoj sa povećanjem racija zaduženosti vrijednost preduzeća raste.

Odnos između zavisne i nezavisne varijble je utvrđen regresionom analizom, a rezultati su predstavljeni u tabeli broj 6.

Tabela 6. Regresiona analiza

Regression Statistics				
Multiple R				0.96040957
R Square				0.922386543
Adjusted R Square				0.89651539
Standard Error				55928440.45
Observations				5
	Coefficients	Standard Error	t Stat	P-value
b_0	272 220 543	52296070.02	5.205372848	0.013779269
b_1	607.720.158	101778266.7	5.971020908	0.009399898

Izvor: Izračun autora

Parametar b_1 iznosi 607 720 158 što znači ukoliko se racio zaduženosti poveća za 1 procentni poen, doći će do povećanja procjenjene vrijednosti preduzeća u prosjeku za navedeni iznos. S druge strane ukoliko je racio zaduženosti 0%, procjenjena vrijednost preduzeća biće jednaka 272 220 543 n.j. Međutim, treba imati na umu da sa povećanjem zaduženosti rastu troškovi finansijskih neprilika, odnosno povjerioci gube povjerenje u dato preduzeće, jer se garantna supstanca njihovog dužnika, a to je podsjetimo se sopstveni kapital, smanjuje, a sa druge strane raste i cijena kako pozajmljenog tako i sopstvenog kapitala.

Shodno navednom postavlja se pitanje koja je to gornja granica zaduženosti preduzeća, odnosno učešća duga u ukupnim izvorima finansiranja, koja maksimizira procijenjenu vrijednost preduzeća. Da bi se dao odgovor na ovo pitanje primjenjena je metoda diskontovanja neto novčanih tokova, na primjeru koji je naveden u prethodnom poglavlju.

Procijenjena je vrijednost preduzeća u 11 varijanti, u zavisnosti od učešća pozajmljenih izvora u strukturi kapitala. Procjena je data u prilogu broj 2. Dobijeni rezultati su prikazani u tabeli broj 7.

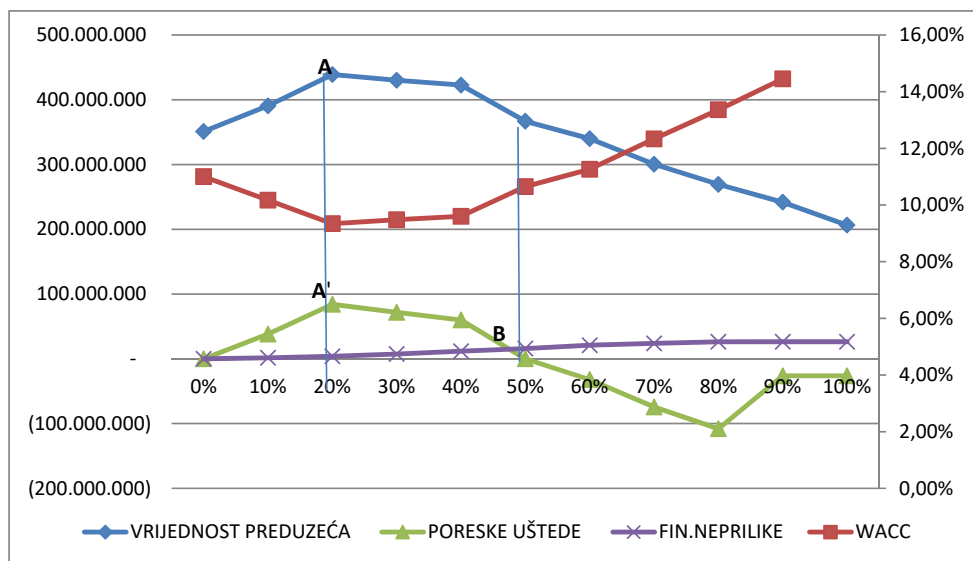
Tabela 7. Procijenjena vrijednost preduzeća

Vrijednost preduzeća	Učešće duga	WACC	Poreske uštede	Fin.Neprilike
350,977,142	0%	11.00%	0	0
390,606,988	10%	10.17%	38,061,467	1,568,379
438,939,723	20%	9.34%	84,114,867	3,847,714
430,055,275	30%	9.48%	71,716,745	7,361,389
422,693,886	40%	9.60%	59,938,236	11,778,509
366,785,296	50%	10.65%	-	15,808,155
339,988,140	60%	11.26%	(31,994,276)	21,005,274
300,452,362	70%	12.33%	(74,361,549)	23,836,769
269,281,551	80%	13.36%	(108,010,456)	26,314,866
241,810,500	90%	14.45%	(26,314,866)	26,314,866
206,416,315	100%	16.20%	(26,314,866)	26,314,866

Izvor: Izračun autora

Na osnovu podatak prikazanih u tabeli broj 6, vidi se da se najveća vrijednost preduzeća od 438 miliona BAM, ostvaruje kada je učešće duga u kapitalu 20%. Pri datom nivou duga ponderisana prosječna cijena kapitala, kao diskontni faktor, je najniža i iznosi 9,34%. Sa daljim povećanjem učešća duga u kapitalu vrijednost preduzeća počinje da opada, kao posljedica rasta prosječne ponderisane cijene kapitala (wacc) raste. Do rasta poderisane prosječne cijene kapitala dolazi usljed pada poreskih ušteda i rasta troškova finansijskih neprilika, što se može vidjeti i sa grafikona broj 3.

Na osnovu grafikona broj 3 vidi se da vrijednost preduzeća raste sa povećanjem učešća duga u ukupnom kapitalu. Maksimalna vrijednost preduzeća od 438 miliona BAM, se ostvaruje kada je učešće duga u kapitalu 20%. Pri datom nivou duga ponderisana prosječna cijena kapitala je najniža i iznosi 9,43%, dok su poreske uštede najviše i iznose cc 84 miliona BAM. Sa daljim povećanjem učešća duga u kapitalu dolazi do rasta prosječne ponderisane cijene kapitala, što ima za posljedicu pad vrijednosti preduzeća.

Grafikon 2. Kretanje vrijednosti preduzeća, poreskih ušteda i troškova finansijskih neprilika

Izvor: Izrada autora

Nakon tačke *A*, vrijednost poreskih ušteda počinje da opada sve do tačke *B*, nakon koje troškovi finansijskih neprilika premašuju iznos poreskih ušteda, što ima za posljedicu i značajnije smanjenje vrijednosti preduzeća. Naime, sve do tačke *B*, procijenjena vrijednost preduzeća se smanjivala od tačke *A* za cc 8 miliona BAM, a nakon tačke *B* počinje da se smanjuje u prosjeku za cc 40 miliona BAM.

Dakle, može se reći da se sa povećanjem učešća duga u kapitalu do određenog nivoa, ponderisana prosječna cijena kapitala opada, kao posljedica rasta poreskih ušteda, što ima za posljedicu rast procijenjene vrijednosti preduzeća. Nakon što se dostigne određeni leveridž duga, sa daljim povećanjem leveridža dolazi do rasta prosječne ponderisane cijene kapitala, kao posljedica smanjivanja poreskih ušteda, što ima za posljedicu smanjivanje procijenjene vrijednosti preduzeća. Međutim, to smanjenje vrijednosti preduzeća će se odvijati po manjoj stopi, sve dok su poreske uštede veće od troškova finansijskih neprilika, onog trenutka kada ovi troškovi nadmaše poreske uštede, dolazi do značajnijeg smanjivanja procijenjene vrijednosti preduzeća. Navedeno potvrđuju i izračunati višestruki koeficijenti korelacije koji su prikazani u tabeli broj 8.

Tabela 8. Koeficijent korelacije

	Vrijednost preduzeća	Učešće duga	Poreske uštede	Fin.Neprilike
Vr. preduzeća	1.00000			
Leveridž	-0.82945	1		
Poreske uštede	0.80161	-0.67032	1	
Fin.neprilike	-0.80536	0.97902	-0.763990138	1

Izvor: izračun autora

Dobijeni rezultati su u skladu sa teorijom statičkog kompromisa, o kojoj je više riječi bilo u prethodnom poglavlju ovog rada.

Testiranje hipoteza

Testiranje hipoteze izvršeno je preko testiranja parametara regresionog modela za metodu diskontovanja neto novčanih tokova. Rezultati su predstavljeni u tabeli broj 9.

Tabela 9. Rezultati testiranja hipoteze

Regression Statistics				
Multiple R	0.829451186			
R Square	0.687989271			
Adjusted R Square	0.653321412			
Standard Error	46420636.62			
Observations	11			
	Coefficients	Standard Error	t Stat	P-value
b_0	440,222,297	26,184,770	16.812150281	0.000000042
b_1	(197,170,561)	44,260,340	(4.454790891)	0.001589162

Izvor: izračun autora

Iz tabele se vidi da odbacujemo nultu hipotezu ($H_0: \beta_1=0$) i uz rizik greške od 0.05 zaključujemo da postoji linearna veza koja je utvrđena između varijacija posmatranih pojava i zaključujemo da je ona u skladu sa teorijom statičkog kompromisa.

ZAKLJUČAK

Analizirajući odnos koji postoji između procjenjene vrijednosti preduzeća, s jedne strane i strukture kapitala, s druge strane, primjenom metode multiplikatora na osnovu uporedivih transakcija, u okviru tržišnog pristupa procjene vrijednosti preduzeća, utvrđeno je da postoji veoma jaka direktna veza između procjenjene vrijednosti preduzeća i racija zaduženosti, kao pokazatelja strukture kapitala. Shodno tome, dobijeni rezultati primjenom metode multiplikatora na osnovu uporedivih transakcija, su u skladu sa MM teorijom.

Međutim, kako sa povećanjem zaduženosti rastu troškovi finansijskih neprilika, odnosno povjerioci gube povjerenje u dato preduzeće, jer se garantna supstanca njihovog dužnika, sopstveni kapital, smanjuje, a sa druge strane raste i cijena kako pozajmljenog tako i sopstvenog kapitala, postavlja se pitanje koja je to gornja granica zaduženosti preduzeća, koja maksimizira procijenjenu vrijednost preduzeća. Da bi se dao odgovor na ovo pitanje primjenjena je metoda diskontovanja neto novčanih tokova.

Primjenom metode diskontovanja neto novčanih tokova, utvrđeno je da je odnos između učešća duga u kapitalu i vrijednosti preduzeća u skladu sa teorijom statičkog kompromisa. To znači da će sa povećanjem učešća duga u kapitalu, vrijednost preduzeća rasti do određenog nivoa tog leveridža, a nakon tog nivoa, vrijednost preduzeća će sa povećanjem učešća duga u kapitalu da se smanjuje.

Nivo učešća duga u kapitalu koji maksimizira vrijednost preduzeća, se razlikuje od preduzeća do preduzeća, odnosno nije jednoznačno određen i on zavisi od cijene sopstvenog i pozajmljenog kapitala, kao i visine stope poreza na dobit.

Uzimajući u obzir navedene rezultate, kao i rezultate testiranja hipoteze, može se zaključiti da je potvrđena postavljena hipoteza iz samog uvida ovog rada, prema kojoj će sa povećanjem učešća pozajmljenog kapitala, vrijednost preduzeća rasti do određenog nivoa leveridža, a nakon tog nivoa sa daljim povećanjem leveridža vrijednost preduzeća se smanjuje.

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THE INFLUENCE OF THE FINANCIAL STRUCTURE OF CAPITAL ON THE ESTIMATED VALUE OF THE COMPANY

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Summary: In the modern business environment, the appearance of mergers and acquisitions, the sale of companies, as well as the disappearance of companies from the market are an everyday occurrence. In these, so called "transactions", there is a need to determine the value of a company that is merged with another company, or that is being sold, or on the other hand that disappears from the market, i.e. goes into liquidation. The companies that are the subject of these "transactions" differ in a number

of criteria. One of these criteria is the capital structure. The capital structure is conditioned by numerous factors, from profitability, creditor security, all the way to financial elasticity. Each of these factors implies a different ratio of equity and borrowed capital. The aim of the research is to determine the influence of the financial structure of capital on the estimated value of the company. The methods used to estimate the value of the company are: the method of discounting net cash flow, as a method of yield approach and the method of multiplier based on comparable transactions, as a method of market approach. The influence of the capital structure on the estimated value of the company was determined on the basis of regression and correlation analysis. The results obtained by applying the multiplier method based on comparable transactions, indicate that, with the increase of the share of borrowed capital in the capital structure, the estimated value of the company increases, which is in line with Modigliani - Miller theorem from 1964.

However, as the costs of financial troubles increase with the increase in indebtedness, i.e. creditors lose trust in a given company, the question arises what is the upper limit of the company's indebtedness that maximizes the estimated value of the company. To answer this question, the method of discounting net cash flows was applied. Applying the method of discounting net cash flows, it was determined that the relationship between the share of debt in capital and the value of the company is in line with the theory of static compromise. This means that with an increase in the share of debt in capital, the value of the company will grow to a certain level of that leverage, and after that level, the value of the company will decrease with an increase in the share of debt in capital. The level of debt participation in the capital that maximizes the value of the company differs from company to company, i.e. it is not unambiguously determined and it depends on the price of equity and borrowed capital, as well as the level of income tax rate. Taking into account the above-mentioned results, as well as the results of hypothesis testing, it can be concluded that the hypothesis was confirmed, according to which with increasing share of borrowed capital, the value of the company will grow to a certain level of leverage, and after that level with further increase of leverage the value of the company decreases.

Key words: capital structure, value estimation, Modigliani - Miller theorem, Static compromise theory.

JEL Classification: G12, G32



ECONOMIC IMPACT OF COVID-19 ON AIR TRAFFIC INDUSTRY: CHALLENGES IN CROATIA

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Abstract: *By the end of September, 2020 total worldwide number of Covid-19 infections has surpassed 34 million inhabitants, while the number of deaths caused by health pandemic crisis stands at more than one million. It's predicted that the year 2020 will see about 10 percent drop in economic growth compared to the previous year. Different macroeconomic scientific and professional authors in their forecasts agree that the worse scenarios will be suffered by global and regional tourism industries together with air transport industry. The consequences of Covid-19 on air transport results in 2020 compared to results in the last three decades are analysed on four different levels - worldwide, European, South-East European and Croatian aviation achievements. Besides, the correlation between the global touristic and air carriers' results in last three decades is considered in the paper with adequate conclusions. IATA monitors developments related to the Coronavirus outbreak, publishes industry statistics and analysis of COVID-19 impacts on the financial and traffic performance and produces outlook for the global air transport industry. According to its latest forecast, full-year 2020 traffic is expected to be down by 66% compared to 2019 while revenues are expected to fall by even more than demand. ICAO has prepared few models and analyses of final business results with different magnitudes on air transport industry recovery. Special attention and business details in the paper are devoted to the Croatian air transport situation in light of Covid-19 with conclusions, suggestions and proposals for future survival and development scenarios, including appropriate actions and measures as well as state, regional or local financial support. The activities and measures taken by Croatia Airlines can be characterized as an example of good practice in the conditions of the Covid-19 pandemic and are articulated as guidelines for the operations of regional airlines in the mentioned conditions.*

Keywords: COVID-19 pandemic; air transport; Croatian air transport; economic impact.

JEL classification: L83, L93, R41, Z32.

INTRODUCTION

The Coronavirus pandemic is a serious crisis situation in public health for citizens, societies and economies around the world. Businesses across industries are facing the biggest economic crisis since World War II. The crisis has had a particularly devastating effect on travels and tourism, with airlines and air transport in general being among the most affected sectors. In the past, various crises have caused a drop in air traffic performance, but as a rule, a rapid recovery would be followed. However, both the International Air Transport Association (IATA) and the International Civil Aviation Organization (ICAO) forecast that air transport will need much longer period to recover this time. In order to return the employment rates and economic activities supported by the airline industry to the pre-crisis levels as soon as possible, governments throughout the world have reached decisions to grant financial aid and support to airlines with packages including recapitalisation, state guarantees for loans, shareholder loans, etc. Such an approach helps reduce the negative effects of the pandemic crisis so that the benefits from aviation, as an important part of traffic infrastructure, could be reaped again once the pandemic gets under control. With special attention to the Croatia Airlines performance indicators, paper is considering and analysing the consequences of the pandemic on the air transport market on different levels: world-wide, Europe, Southeast Europe and Croatia.

AIR TRANSPORT INDUSTRY IN WORLD ECONOMY

The air transport industry is powering global economic growth and employment through connectivity that enables the development of tourism and global business. In addition, important fact is that air transport industry is enabling the increase of goods and people movement across borders facilitating the development of social and economic networks. During the year 2019 nearly 1,500 airlines around the world operated a total fleet of 33,300 aircraft and carried 4.5 million passengers plus 61 million tons of freight. They serve 3,780 airports through a route network of several million kilometres managed by 160 air navigation service providers. (ATAG, 2020, p. 11).

It is important to emphasize the air transport contribution to sustainable development and continuous work to limit its impact on the environment. Analyzes done by the aircraft manufacturer Airbus show that aircraft in year 2019 were 75 percent quieter and 80 percent more fuel efficient per seat than they were when becoming a more common sight in cities around the world. Aviation contributes two to three percent of the world's manmade emissions of carbon dioxide (CO₂), with transportation as a whole (cars, trains, shipping etc.) producing ~24 percent (Airbus GMF, 2019, p. 3).

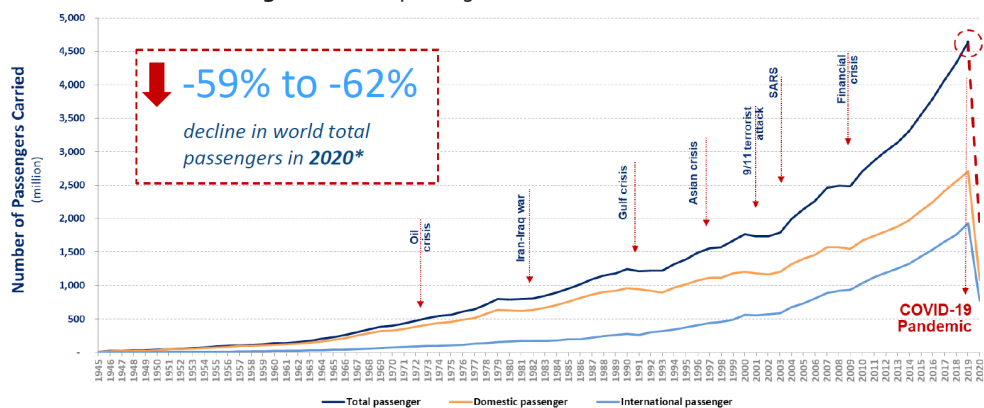
Aviation jobs are, on average, 4.3 times more productive than other jobs and before Covid-19 crisis. Air Transport Action Group (ATAG) emphasizes in its recent publication that the air transport industry supported a total of 87.7 million jobs globally, through direct, indirect, induced and catalytic impacts. Direct jobs represent 11.3 million employees including airlines, airports, air navigation and aerospace. Aviation's global economic impact (direct, indirect, induced and catalytic) is estimated to USD 3,500 billion, equivalent to 4.1 percent of world GDP¹. The importance of the air transport industry is also evidenced by the facts that 58 percent of international tourists trav-

¹ GDP - Gross Domestic Product.

el by air and air transport carries around 35 percent of world trade by value, less than 1 percent by volume (ATAG, 2020, pp. 10-19). The significant impact of air transport is reflected in the increase in productivity of the world economy due to easier access to far more areas than other transport modes. The development of air transport in a particular country or region increases the efficiency of the supply chain, which could be a deciding factor when making investment decisions by investors (Bajić, 2020, p. 20).

Air transport industry have almost always been linked to economic cycles on global and regional level, and also depends on GDP development. During the time, this industry has also been affected by other significant factors, most notably several oil crises, Iran-Iraq war crisis, Gulf war crisis and Asian crisis. In the 21st century it was followed by World Trade Centre terrorist attack (9/11) and SARS² which had tremendously negative impact on the profitability of several major airlines (Figure 1) (Škurla Babić, Tatalović, & Bajić, Air transport competition challenges, 2017). The business year of 2020 will be marked by the evolution of a new, dangerous Coronavirus (COVID-19) that has spread throughout the world and disrupted our way of life. In order to prevent its further spread, many countries have restricted travels and suspended operations of many economic sectors by introducing limitations and strict quarantines, all in an effort to stop the spread of epidemic. The measures introduced in an attempt to stop the spread of the Coronavirus have greatly affected economic activities, pushing the world into the worst recession since the Second World War. International Monetary Fund (IMF) in its outlook of October, 2020, projected decline of global GDP in 2020 to 4.4 percent (IMF, 2020). World trade organization (WTO, 2020) prediction shows a fall of global merchandise trade volume by 9.2 percent in 2020 compared to 2019. The demand for air transport services collapses by unprecedented decline in history, caused by the global pandemic in 2020 and stops the continuous growth trends, as shown in Figure 1 (ICAO, 2020).

Figure 1. World passenger traffic evolution 1945 – 2020



Source: ICAO (2020) Effects of Novel Coronavirus (COVID-19) on Civil Aviation: Economic Impact Analysis, Montreal: International Civil Aviation Organization Air Transport Bureau, p.6.

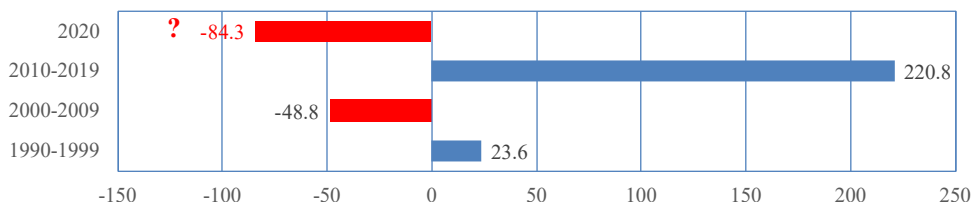
As can be seen from Figure 1 the Coronavirus pandemic has had a devastating effect on the global airline industry, which is facing the worst crisis ever.

² SARS - Severe acute respiratory syndrome.

AIR TRANSPORT RESULTS AND CONSEQUENCES OF COVID-19 PANDEMIC

The Coronavirus has brought airlines to their knees, forcing them to put their aircraft out of operation, cancel flights and announce tens of thousands of lay-offs. According to the International Air Transport Association (IATA, 2020) global commercial airlines net loss of 84.3 billion USD is expected in the 2020, which is shown in Figure 2 compared to the financial results of airlines over the last three decades.

Figure 2. Global commercial airlines net profit by the decades 1990-2019 plus 2020 (billion USD)



Source: Prepared by authors according (Mišetić, Bajić, & Tatalović, 2018, p. 99) and (IATA, 2020).

Detailed selected airline performance indicators are presented in the Table 1.

Table 1. Global commercial airlines selected performance indicators 2000-2020

Worldwide airline industry	2000	2005	2010	2015	2018	2019	2020	AAGR*
REVENUES, \$ billion	329	413	564	721	812	838	419	5.0%
Passenger, \$ billion	256	323	445	545	610	612	241	4.7%
Cargo, \$ billion	40,0	68,6	88,6	83,8	111,3	102,4	110,8	5.1%
Sched passenger numbers, millions	1,672	2,135	2,675	3,569	4,378	4,543	2,246	5.4%
Freight tonnes, millions	30.4	41.9	50.5	54.8	63.3	61.3	51.00	3.8%
World economic growth, %	4.7	3.5	4.1	2.8	3.1	2.5	-5.00	-
EXPENSES, \$ billion	318	409	536	659	766	795	517	4.9%
Fuel, \$ billion	46	91	151	175	180	188	78	7.7%
Crude oil price, Brent, \$/b	28.8	54.5	79.4	53.9	71.6	65.0	35.0	4.4%
Flights, million	21.0	24.9	27.8	34	38.1	38.9	23.1	3.3%
Break-even weight load factor, %	60.8	63.0	64.6	62.4	63.5	65.9	73.3	0.4%
Weight load factor achieved, WLF%	61.5	63.6	67.9	68.3	67.3	69.5	59.4	0.6%
Passenger load factor achieved, PLF%	71	75,2	78,9	80,5	81,9	82,5	62,7	0.8%
OPERATING PROFIT, \$ billion	10.7	4.4	27.6	62.0	45.9	43.2	-88.0	-
% margin	3.3	1.1	4.9	8.6	5.7	5.2	-23.4	-
NET PROFIT, \$ billion	3.7	-4.1	17.3	36.0	27.3	26.4	-84.3	-
% margin	1.1	-1.0	3.1	5	3.4	3.1	-21	-
per departing passenger, \$	2.2	-1.9	6.4	10.1	6.2	5.8	-37.5	-
Return on Invested Capital, %	5.0	3.3	6.2	7.9	6.5	5.8	-16.9	-

AAGR* - Average Annual Growth Rate 2000-2019

Source: Prepared and modified by authors according (Škurla Babić, Tatalović, & Bajić, 2017) (IATA, 2020).

Financial losses during the first decade of a twenty first century (2000-2009) amounted to 48.8 billion USD with seven negative financial years. New positive economic and financial cycle of the global airline industry started from the year 2010. In the period from 2010 to 2019 more than 220 billion USD net profit was achieved. In the period 2000-2019 an average annual growth rate of revenues (5.0 percent), was faster compared to growth rates of expenses (4.9 percent) generating net profit of 172 billion USD. In 2020, approximately half of that amount is likely to be lost, and possibly even more, depending on the pandemic development by the end of the year.

Faced with a large drop in demand and liquidity problems airlines have responded promptly to the Covid-19 crisis with a range of operational and strategic measures. More than 60 percent of the world's commercial aircraft have been grounded and all airlines reacted immediately with retrenchment to cut costs drastically (Albers & Rundshagen, 2020). Governments throughout the world have reached decisions to financially support airlines respecting their importance for transport infrastructure and protecting the millions of jobs. The total amount of 159 billion USD refers to confirmed or proposed government support. Main implications of the growing governments presence in the sector (Abate, Christidis, & Purwanto, 2020) are:

- Implications on liberalisation and/or deregulation.
- Implications for airline ownership.
- Implications on environmental sustainability.

Generally during economic recessions, two major components of GDP consumption and investment declines, but investment is far more volatile than consumption over the business cycle (Mankiw, 2019, p. 330). Besides, broadly speaking, air travel grew each year by on average, one and a half to two times, as fast as world GDP (Doganis, 2019, p. 178). But in the case of pandemic consequences it is obviously not realistic (GDP -5 percent vs. passenger traffic at least -50 percent). Economic recession and recovery are classified in four distinct shapes (V, U, L and W) and each of these are characterized by, and how long they typically last before full recovery (Ghosh, 2020):

- V-shape: normal shape for recession with sharp decline in the economy is quickly and immediately followed by a rapid recovery.
- U-shape: economy stagnates for a few quarters and up to two years, before experiencing a relatively healthy rise back to its previous peak (Ghosh, 2020).
- L-shape: a sharp decline in the economy, followed by a slow recovery period with possibility of not returning to trend line growth (ICAO, 2020).
- W-shape: double-dip recession with "down up down up" pattern before full recovery (ICAO, 2020).

During the crisis it is important to focus on activities for future consolidation and development including several affecting factors (Vasigh, Fleming, & Tacker, 2018, p. 15):

- The economic cycle's peaks and troughs.
- Gross Domestic Product.
- Lower travel cost.
- Political factors.
- Random events.
- Trade liberalizations and open skies.

Experiences of 2020 indicate that external shock like global pandemic issue is also very important factor. Besides, the growth-related forces in aviation can be divided in two groups. In the first group there are disruptive market dynamics, explosive demand growth and transformational technology changes which stimulate rapid growth. Set of two constraints opposing forces are complexity and tyranny of technology plus regulatory and operational constraints. When these forces meet each other in different directions “*earthquakes*” happen (Taneja, 2019, p. 2).

Pandemic crisis in 2020 is by far the worst blow for the air transport sector as a whole, as it has affected airlines, airports, air traffic control, aircraft and engine manufactures. In order to survive Covid-19 crisis, one of the main challenges for airlines has been controlling their cash burn until air travel demand recovers. IATA estimates that the industry burned 51 billion USD of its cash reserves in Q2 2020, and expect additional 77 billion USD in cash during the second half of 2020. Airline industry will continue to burn through cash until 2022 (IATA, 2020a). Before the crisis, according to IATA analyzes 80 percent of the listed airlines had a rating which exceeded the “*highly speculative*” grade (B+) and the median airline had a rating in the range of BB+ to BB-. The median airline rating has shifted to the “*highly speculative*” and “*extremely speculative*” credit ratings – CCC+, CCC (IATA, 2020b). As a result of the pandemic, airlines are facing structural changes in the industry, including changes in passenger behaviour. These facts call for airlines to get closer to customers which is becoming easier in the digital environment. That enables data collection and analysis of all phases of travel for better prediction of customer behaviour (Taneja, 2018, p. 17).

Airports Council International (ACI, 2020) estimates the airport industry will suffer a -60 percent reduction in passenger traffic and revenues of -104.5 billion USD. Eurocontrol predicts a traffic return to pre-covid levels in 2024 and emphasizes that in terms of space at the airports, the situation is critical. Much more space is required to manage measures of physical distance: 50 percent at check-in, 100 percent at security control and 35-50 percent in boarding gates (ARC & Desart, 2020).

A large drop in demand for air transport services caused by an unprecedented crisis worldwide strongly affected aircraft manufacturers and commercial aircraft production rates have been adapted accordingly (Airbus, 2020). It should be emphasized that Airbus appreciates the government support that has enabled the company to limit these necessary adaptation measures which includes 15,000 staff reduction. However, with air traffic not expected to recover to pre-pandemic levels before 2023 and potentially as late as 2025, aircraft manufactures now need to make additional measures to reflect the post Covid-19 industry outlook (Airbus, 2020).

Tourism industry is complementing to air transport with similar magnitude of demand decrease in 2020. Air Transport Action Group (ATAG) emphasizes that tourism industry in a broader sense is also very affected, with analysis suggesting the global pandemic crisis could cause a drop between 850 million and 1.1 billion international tourists arrivals and a loss of 910 billion USD to 1,200 billion USD in export revenues from tourism, putting 100 to 120 million direct tourism jobs at risk all around the world (ATAG, 2020, p. 5). For international tourism arrivals, air transport has become a major type of traffic and air transport plays a dominant role in inter-regional movements of tourists, which normally entails travel over long-distance. This is a particularly important trend for aviation, given that there is no alternative mode of transport which

can be used here (Graham, 2008). The growth rates of international air transport are related to the growth rates of international tourism. Table 3 shows the data of transported passengers in air transport and the number of international tourist arrivals in the period 1990-2019 on global level.

Table 2. Air transport passengers and international tourist arrivals in the period 1990-2019

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	AAGR
Air Transport Passengers (million)	1,165	1,135	1,146	1,142	1,233	1,304	1,391	1,457	1,471	1,562	3.3%
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
	1,672	1,640	1,665	1,764	1,994	2,135	2,255	2,452	2,489	2,479	4.5%
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	2,675	2,859	2,991	3,143	3,328	3,569	3,817	4,095	4,378	4,543	6.1%
International tourist arrivals (million)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	
	440	443	480	496	520	531	561	586	602	625	4.0%
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
	674	675	695	692	757	810	856	913	930	893	3.2%
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
	952	997	1,044	1,097	1,143	1,197	1,243	1,333	1,408	1,462	4.9%

AAGR = Annual Average Growth Rate

Source: Prepared by authors according (Tatalović, Mišetić, & Bajić, 2017), (IATA, 2020) and (UNWTO, 2020).

In addition to the data in Table 2, the authors included IATA estimations for passenger air transport of -51 percent, and UNWTO estimations for international tourist arrivals of -70 percent for 2020 (middle scenario).

In the context of a global pandemic, a correlation metric has been developed that analyzes the correlation between air transport passengers and international tourist arrivals. According to the definition of author Ken Black Pearson correlation coefficient “ r ” is a measure of the linear correlation of two variables (Black, 2019, pp. 739-741):

$$r = \frac{\Sigma(x-\bar{x})(y-\bar{y})}{\sqrt{\Sigma(x-\bar{x})^2 \Sigma(y-\bar{y})^2}} = \frac{\Sigma xy - \frac{(\Sigma x \Sigma y)}{n}}{\sqrt{\left[\Sigma x^2 - \frac{(\Sigma x)^2}{n} \right] \left[\Sigma y^2 - \frac{(\Sigma y)^2}{n} \right]}} \quad (1)$$

Analysing the data from Table 2 and additional 2020 predictions, it is possible to create correlation matrix for two different 30-year periods (Fraser, 2016, pp. 267-268). Based on correlation matrix results are visible in Table 3.

Table 3. Correlation metrics - Air Transport Passengers and International tourist arrivals

1990-2019	Passengers	Tourist	1991-2020	Passengers	Tourist
Passengers	1		Passengers	1	
Tourist	0.996185562	1	Tourist	0.969600004	1

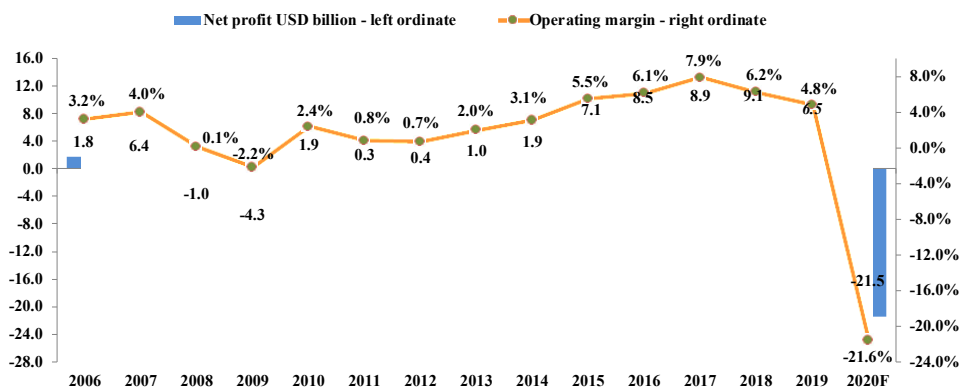
Source: Prepared by authors

Correlation analysis is indicating almost perfect correlation between two analysed parameters.

EUROPEAN AIRLINE INDUSTRY IN A PANDEMIC ENVIRONMENT 2020

According to IATA, in 2020 the European airlines will generate losses of \$21.5 billion, with an operating margin of -21.6% (Figure 3). Passenger traffic expressed in revenue passenger kilometres will decline by 56.4% compared to 2019 (IATA, 2020). A gradual opening of the European airspace and the resuming of interregional travels in June have stimulated recovery amidst lifting of strict quarantine measures. Most travel restrictions were lifted in early July, except for the citizens of certain countries where the virus was still spreading rapidly. However, with the second wave of the pandemic affecting Europe, the recovery of air traffic by the end of the year is no longer certain.

Figure 3. Net profit and EBIT margin of European airlines in the period from 2006 to 2020



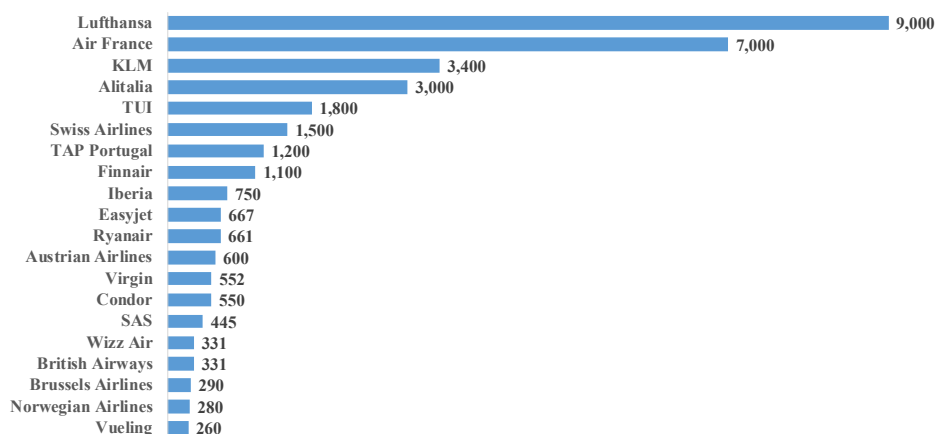
Source: Prepared and modified by authors according to (Škurla Babić, Tatalović, & Bajić, 2017) (IATA, 2020).

The airlines affected by the crisis are also facing passenger demands related to cancellation refunds, which represents an additional pressure on their already aggravated situation. The European Commission has also addressed the issue of passenger rights by approving the temporary use of vouchers when cancelling a flight, pointing out that the companies are required to comply with Regulation (EC) No 261/2004 (European Commission, 2004). Due to the major negative consequences of the COVID-19 pandemic on the economy, the European Commission has eased state aid rules, and the document “Temporary Framework for State Aid Measures to Support the Economy in the Current Covid Pandemic 19” (European Commission, 2020) allows coordinated economic intervention by European Union member states in overcoming the crisis. In

addition, a decision was made that airlines retain the right to coordinated airport slots, which allowed them to make financially sound decisions on whether to fly, in order to avoid empty flights. Under normal circumstances, operators must use 80 percent of the airport slots allocated to secure this allocation for next season.

The European airlines are receiving huge support from their governments to mitigate these negative repercussions on the European Union economy (Figure 4). Response measures include loans, loan guarantees, credit guarantees, government shares or takeover. This is opposite from the airline privatization processes in Europe before 2020 crisis (Tatalović, Bajić, & Šupuković, 2017). The highest amount was granted to Lufthansa, followed by Air France and KLM. Among other European airlines, five leading low-cost carriers received in total 2.2 billion EUR (Easyjet, Ryanair, Wizz Air, Norwegian and Vueling).

Figure 4. Government support for selected European airlines in 2020



Source: Prepared by authors according (De Best, 2020).

Southeast Europe (SEE) air transport market is also strongly affected with Covid-19 crisis. Region is still undeveloped with weak connections within the region and increasing competition on the main traffic directions to Western Europe. Traffic, economic and political criteria for categorization of the airports is starting from the capitals and main cities of the region, together with minimum traffic volume of at least 500,000 passengers a year (Bajić, Mišetić, & Tatalović, 2016). In the period 2006 – 2019, number of passengers on dominant Southeast Europe airports increased from 22 million to 68 million with achieved average annual growth rate of 9.1 percent (Table 4).

Table 4. Passengers on dominant airports in the SEE region 2006-2019 (thousands)

Airport	Passengers (Thousand)					AAGR %	2020
	2006	2010	2015	2018	2019		
Bucharest OTP	3,514	4,803	9,283	13,820	14,697	11.6	-62%
Sofia SOF	2,209	3,297	4,089	6,962	7,107	9.4	-55%
Belgrade BEG	2,222	2,699	4,776	5,641	6,159	8.2	-68%
Zagreb ZAG	1,728	2,072	2,588	3,336	3,436	5.4	-70%
Tirana TIA	906	1,537	1,977	2,947	3,338	10.6	-59%
Split SPU	1,096	1,220	1,955	3,124	3,302	8.9	-79%
Chisinau KIV	548	938	2,219	2,829	2,996	14.0	-60%
Cluj Napoca CLJ	244	1,029	1,488	2,782	2,924	21.0	-60%
Dubrovnik DBV	1,120	1,270	1,694	2,539	2,896	7.6	-88%
Burgas BOJ	1,702	1,873	2,360	3,277	2,886	4.1	-60%
Prishtina PRN	883	1,306	1,579	2,166	2,374	7.9	-60%
Skopje SKP	542	681	1,456	2,158	2,360	12.0	-69%
Varna VAR	1,400	1,199	1,399	2,281	2,084	3.1	-60%
Ljubljana LJU	1,334	1,389	1,438	1,812	1,721	2.0	-70%
Timisoara TSR	754	1,138	924	1,517	1,597	5.9	-60%
Tivat TIV	451	542	889	1,246	1,367	8.9	-80%
Iasi IAS	71	160	377	1,257	1,314	25.2	-60%
Podgorica TGD	382	652	749	1,209	1,297	9.9	-70%
Sarajevo SJJ	466	563	773	1,047	1,144	7.1	-78%
Zadar ZAD	65	275	488	604	801	21.3	-85%
Pula PUY	209	324	352	709	778	10.6	-90%
Sibiu SBZ	64	199	312	700	744	20.8	-60%
Tuzla TZL			259	585	592	-	-59%
Total	21,912	29,163	43,425	64,549	67,914	9.1	-68%

Source: Prepared by authors according (Bajić, Mišetić, & Tatalović, 2016), (Škurla Babić, Mišetić, & Bajić, 2017) and (anna.aero, 2020).

Unfortunately, actual 2020 crisis turn the score to 2006 achievement which means a drop of 68 percent.

CROATIA AIRLINES COVID-19 CHALLENGES

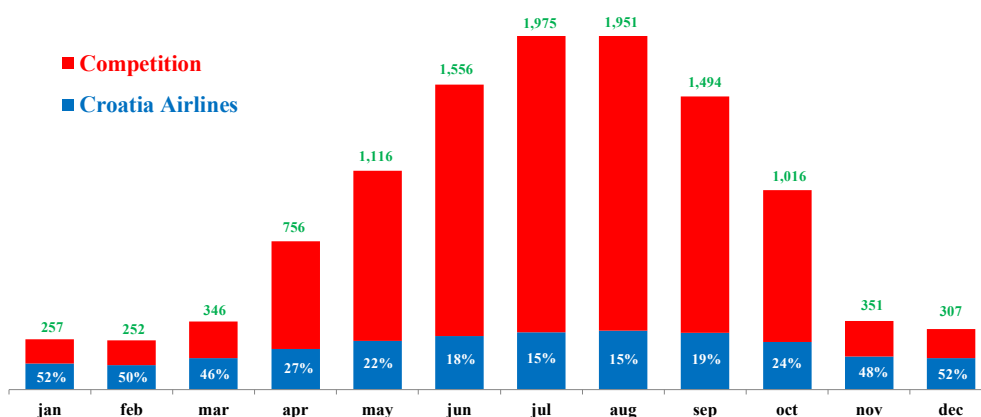
The Croatian economy is expected to see a nine percent decline in 2020, which is the sharpest fall estimated by the International Monetary Fund for the emerging and developing European economies. The expected unemployment rate in 2020 is estimated to 9.3 percent and inflation should be to 0.3 percent (Table 5).

Table 5. Selected Croatian economy indicators 2018 - 2025

Indicator	2018	2019	2020	2021	2022	2023	2024	2025
GDP percent change (%)	2.7	2.9	-9.0	6.0	4.4	3.5	3.1	3.0
Inflation rate (%)	1.5	0.8	0.3	0.8	1.1	1.8	2.2	2.1
Unemployment rate (%)	9.9	7.8	9.3	10.3	9.6	8.8	8.0	7.1

Source: Prepared by authors according (IMF, 2020a).

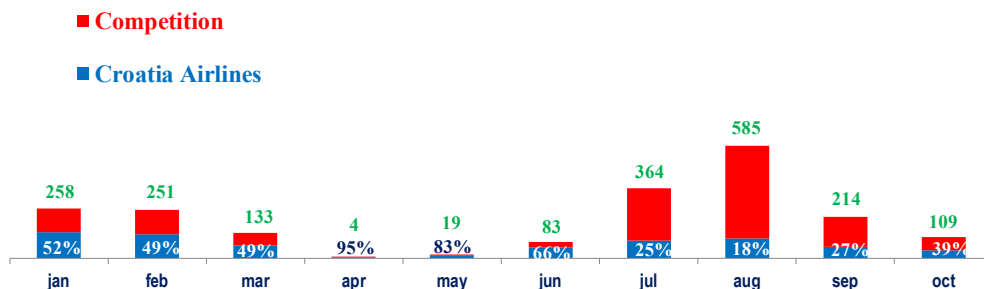
Tourism revenues have an exceptionally high share in Croatia's GDP, and the tourism, transport and hospitality sectors are among the most affected ones by the Covid-19 pandemic. The preseason lost, with the pandemic gravely affecting the main tourist season. The European countries, in particular Germany, Slovenia, Italy and Austria, as the key feeder markets for Croatia's tourism, are severely affected by the negative economic trends. Furthermore, as the European Union countries are Croatia's major export markets, it is beyond doubt that exports will face a strong decline. Croatian air transport market is characterised by high seasonality, with a high level of competition in the summer months. More than half of all passengers on the market are transported in the third quarter, when nearly 100 airlines operate, while the competition in the winter period is minimal (Croatia Airlines, 2020). Top traffic results in 2019 on the Croatian air transport market (Figure 5) due to Covid-19 crisis according to actual forecasts will not be reached again before 2024.

Figure 5. Passengers (000) in Croatian Air Transport Market 2019 (Croatia Airlines vs competition)

Source: Prepared by authors according (DZS RH, 2020) and (Croatia Airlines, 2020) internal data.

In 2019 Croatian airports saw an 8 percent rise in the passenger numbers compared to 2018, with a total of 11.4 million passengers and Croatia Airlines market share was 23 percent.

Figure 6. Passengers (000) on Croatian Air Transport Market 2020 (Croatia Airlines vs competition)



Source: Prepared by authors according (DZS RH, 2020a) and (Croatia Airlines, 2020) internal data.

Due to the Coronavirus pandemic and restricted flights and travels, the Croatian airports recorded a great fall in the number of passengers, ranging between 70 and 90 percent in the first nine months of 2020, compared to the same period of 2019. According to the data of the Croatian Bureau of Statistics, in nine months of 2020, Croatia's airports recorded 1,697 thousand passengers, what is 80% decline compared to the same period of 2019. Croatia Airlines market share in the observed period was 34 percent. According to the internal Croatia Airlines data for the period January-October, 2020 number of flights decreased by 57 percent, number of passengers carried decreased by 70 percent and passenger load factor dropped by 23.2 percentage points.

According to the projections of financial results for 2020, made by Croatian Chamber of Economy and prepared for the Croatian Government, the air traffic operators in the Republic of Croatia (airports, air traffic control and Croatia Airlines) will record a total financial loss of 1.3 billion HRK in 2020, with a revenue loss in the first nine months estimated to 1.6 billion HRK. (Croatian Chamber of Economy, 2020).

Despite the extraordinary circumstances in early March of 2020, Croatia Airlines continued with its operations on a reduced schedule, adhering to the decisions of both public health and aviation authorities, while the majority of foreign carriers suspended all their flights to Croatia as early as mid-March. The COVID-19 crisis has reaffirmed Croatia Airlines importance for the transport infrastructure of the Republic of Croatia. Since the beginning of the crisis and until the May of 2020, Croatia Airlines has enabled about 23,000 Croatian citizens to return home. Furthermore, Croatia Airlines put at disposal to the Croatian Government capacities for the transport of humanitarian aid, return of Croatian soldiers from Afghanistan and operating several repatriation flights from various parts of Europe.

Immediately at the beginning of the crisis in March of 2020, Croatia Airlines introduced rigorous measures in all business segments, which, together with the signing of agreements with unions on reducing collective bargaining rights and agreements with a large number of suppliers, resulted in significant savings in 2020. The most important measures are the cancellation of the short-term seasonal lease of the CRJ1000 aircraft, cancellation of the long-term dry lease of the Q400 aircraft and the agreement with the lessor of the A319 aircraft which will be used on „power by the hour “(PBH)

bases until the beginning of the summer season 2021. Out of the current thirteen aircraft and engine rental contracts, eleven contracts have been agreed with lessors to reduce the cost of monthly rental instalments using the PBH calculation. Investments decreased, seasonal employment was cancelled, promotional campaigns were postponed and promotion costs were reduced in all markets, business travel budgets and training of non-operational staff were reduced. Due to the crisis caused by the Coronavirus pandemic and the preservation of liquidity, Croatia Airlines has fulfilled its obligation to hand over greenhouse gas emission units for 2019 by using free emissions for 2020. Part of the reduction in outflows is related to the reduction of costs directly related to the operation due to the reduction in the volume of traffic. Besides, in the period April-June, 2020 a deferral of credit obligations was agreed with commercial banks, measures of the Croatian Government were used to defer payment of taxes and contributions on salaries and other various membership fees. However, all those measures could not compensate revenue losses. In the period from April to September, 2020, the revenue decreased by more than 70 percent compared to the same period of 2019. Besides, Croatia Airlines continues to apply a reporting system in accordance with quality procedures in order to stabilize all management and decision-making processes. The list of selected reports includes: weekly and monthly booking profile, booking profile of selected flights, booking class list report, profitability by aircraft types and traffic types, route profitability, profitability by markets, daily profitability, cost committee report, revenue committee report etc (Tatalović, Mišetić, & Bajić, 2012, p. 768).

On 21st February, 2019, the Croatian Government reached a decision to initiate the procedure of seeking a strategic partner and to establish a commission to implement the procedure and propose the selection of a strategic partner for Croatia Airlines. During the process two non-binding offers from Aegean Airlines (Greece) and Air Nostrum (Spain) were received. However, the procedure was suspended due to the outbreak of the COVID-19 crisis, and in March of 2020 the Commission in Charge of Implementing the Procedure and Proposing a Strategic Partner for Croatia Airlines decided to put it on hold amidst the unfavourable situation and force majeure. In line with the goals of the Croatian Government Croatia Airlines has prepared a business plan for 2020-2025, setting out in detail the strategic, financial and operational goals of overcoming the Covid-19 crisis. This plan, therefore, includes the state financial support measures compliant with the European Commission's Temporary Framework for State Aid Measures to Support the Economy in the Current COVID-19 Outbreak.

CONCLUSION

At the beginning of November 2020, total worldwide number of Covid-19 infections has surpassed 50 million inhabitants. Public health, social and economic crisis all around the world caused the deepest crisis ever for air transport industry. The same scenario was experienced by the tourism industry since the performances of international tourist arrivals and passenger air transport are in an almost perfect correlation. According to the latest ICAO and IATA forecasts, drop of air passenger traffic is expected on the level close to 60 percent. Having in mind consequences and economic impact of pandemic crisis on air transport results, the governments on global level decided to support airlines surviving processes with a wide range of financial measures in amount of 159 billion USD. Consequently, European Commission also has

eased state aid rules. In Croatia drop in air passenger traffic is higher than 70 percent which is among deepest negative magnitude compared to the rest of the world. Croatia Airlines introduced rigorous savings measures in all segments as early as March 2020, when the crisis began. Croatia Airlines Business Plan 2020 - 2025 includes necessary measures and presumptions for sustainable business in the future. It is reasonable to assume that traffic volumes recorded in 2019 on the Croatian air transport market will not be reached before 2024 due to Covid-19 crisis. The activities and operational measures taken by Croatia Airlines can serve as guidelines for regional airlines in coping with the Covid-19 pandemic and ensuring business continuity. They were introduced in all business segments and included carefully reducing the number of flight operations and frequencies while anticipating changes in passenger demand caused by pandemic, restructuring and cancellation of aircraft leasing arrangements, proactive measures to maintain passenger confidence i.e. easy cancelling, rescheduling and ticket refunding, quickly development of new airport procedures and in-flight services adhering to the decisions of both public health and aviation authorities. Moreover, cost cutting measures, signing of agreements with unions on reducing collective bargaining rights and agreements with many suppliers brought important savings in 2020. To recover and succeed in the post-pandemic era, the aviation industry has to acquire data on both the economic standard of its passengers and their willingness to travel again and the expansion of COVID-19 and its variants and use predictive analytics to forecast recovery patterns. losses accurately. To facilitate airline management in preparing for the Post-COVID-19 era, future research should adapt various predictive and diagnostic analytics for real-time data analysis to predict demand and behaviour of potential passengers and identify changes in markets. Recovery data from previous crises should be analysed to determine recovery patterns of different market segments and to comprehend how pandemic affected different route areas around the world. States are becoming increasingly involved in air traffic - either as creditors or as part of the administration. Research should be conducted to determine the potential for negotiating better and fairer business conditions in the future, in particular ensuring financial stability to make airlines more resilient to future crises and recessions and a more balanced distribution of values between airlines, airports and air traffic management organizations.

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EXTENSION OF THE MINIMUM COST FLOW PROBLEM (MCFP OR CNF) BY CONSIDERATION OF TIME AND QUANTITY OF LOADS WITH MAXIMUM TIME

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Abstract: *This paper extends the general problem of minimizing the total cost of transport on the road network (CNF) by considering the total time, maximum time and total amount of cargo with the longest time. In the literature available to us, models with timing and amount of cargo in the case of a standard transport task were exposed. Optimization is possible by combining 5 criteria, 2 linear and 3 nonlinear ones over the same set of linear constraints. Multicriteria optimization determines Pareto-optimal solutions. Interactive analyst-software algorithms for solving the selected models were defined. The solution of hypothetical problems was illustrated. Closed model with 5 two-way asymmetric communications using software for CNF and it is possible to use software for LP. Four one-criteria problems were solved: total costs, overall transport performance from a time standpoint, transport time (problem of the second type by time) total transport time (problem of the third type by time) and one bi-criteria problem related to the simultaneous minimization of the maximum duration of transport and total costs.*

Keywords: *cost flow problem; total time; Pareto-optimal solutions; algorithms; software.*

JEL classification: *C61*

INTRODUCTORY REMARKS

Network models are well-known examples of problems in practice and are featured in many textbooks and books (for example, (Pašagić, 2003), (Nikolić, 2007), (Pašagić & Kurtanović, 2017) in our country). They have been taught by basic studies of economics and technical colleges in the world as well as in our country.

The **minimum-cost flow problem (MCFP)** is an optimization and decision problem to find the cheapest possible way of sending a certain amount of flow through a flow network. A typical application of this problem involves finding the best deliv-

ery route from a factory to a warehouse where the road network has some capacity and cost associated. The minimum cost flow problem is one of the most fundamental among all flow and circulation problems because most other such problems can be cast as a minimum cost flow problem and also that it can be solved efficiently using the network simplex algorithm (Wikipedia, 19.03. 2021).

Minimum Cost flow problem is a way of minimizing the cost required to deliver maximum amount of flow possible in the network. It can be said as an extension of maximum flow problem with an added constraint on cost(per unit flow) of flow for each edge. One other difference in min-cost flow from a normal max flow is that, here, the source and sink have a strict bound on the limits on the flow they can produce or take in respectively, $B(s) > 0$, $B(t) < 0$. Intermediate nodes have no bounds or can be represented as $B(x) > 0$ (Kumar, 2005).

Particularly popular WinQSB software (Long Chang & Desal, 2002) can be downloaded for free from multiple addresses and was included in education at a number of the higher education institutions in the world (especially for Spanish speaking, detailed text instructions such as (Celis) can be found, as well as suitable verbal views on YouTube). It covers the following issues: (1) Network Flow, (2) Transportation Problem, (3) Assignment Problem, (4) Shortest Path Problem, (5) Maximal Flow Problem, (6) Minimal Spanning Tree, (7) Traveling Salesmen Problem. (Nikolić, 2007), (Pašagić & Kurtanović, 2017), (Kurtanović, Destović, & Kulenović, 2019).

This paper shows that optimization is possible by combining 5 minimization type criteria, 2 linear and 3 nonlinear ones, over the same set of linear constraints. For problems by time, we use the two-phase transport classification from (Vukadinović & Cvejić, 1995): (1) total cost, (2) overall transport performance from a time standpoint (problem of type 1 per time), (4) maximum transport time (problem of type 2 per time, (Barsov, 1959)), (3) total transport time (problem of type 3 per time, (Nikolić, 2007)), (5) total cargo with maximum time (HAMER, 1969). Optimizing multiple criteria determines Pareto-optimal solutions (Matthias, 2000).

Defined interactive analyst-software algorithms are displayed on selected hypothetical examples using CNF software from WinQSB.

MATHEMATICAL FORMULATION OF THE PROBLEM

It is appropriate to formulate a general mathematical model in the case of the homogeneous cargo transport closed problem in the following form:

$$\min C(x) = \sum_{i=1}^n \sum_{j=1}^n c_{ij} x_{ij} \quad (1)$$

$$\min T_{ET}(x) = \sum_{i=1}^n \sum_{j=1}^n t_{ij} x_{ij} \quad (2)$$

$$\min T(x) = \sum_{i=1}^n \sum_{j=1}^n (t_{ij} \mid x_{ij} > 0) \quad (3)$$

$$\min t(x) = \min \left\{ \max (t_{ij} \mid x_{ij} > 0) \right\} \quad (4)$$

$$\min q(x) = \sum_{i=1}^n \sum_{j=1}^n (x_{ij} \mid t_{ij} = t^*) \quad (5)$$

subject to:

$$\sum_{j=1}^n x_{ij} - \sum_{j=1}^n x_{ji} = p_i, \quad i = 1, \dots, n \quad (6)$$

$$\sum_{i=1}^n p_i = 0 \quad (7)$$

$$0 \leq x_{ij} \leq d_{ij}, \quad i=1, \dots, n; \quad j=1, \dots, n \quad (8)$$

where: n = number of network nodes, $(i-j)$ and/or $(j-i)$ = network or communication ports ($i \neq j$), x_{ij} = unknown load volume [tonnes, t] on $(i-j)$, d_{ij} = upper capacity limit for $(i-j)$, c_{ij} = unit costs [monetary units per 1t, m.u./t] on $(i-j)$, t_{ij} = transport time [minutes] for $x_{ij}[t]$, p_i = characteristic of i -type node [t]: ($p_i > 0$ for the supply, $p_i < 0$ for demand, $p_i = 0$ for transit), (6) the condition that the own supply with the eventual receipt of cargo from other nodes be forwarded to other nodes (if $p_i > 0$), or that its own demand can be satisfied and possible over load forwarded to the other nodes (if $p_i < 0$), that is, the transits received load forwarded further (if $p_i = 0$), (7) equilibrium of total supply and total demand, and (8) conditions that non-negative variables x_{ij} do not exceed d_{ij} . Communications can be: (a) one-way, only $(i-j)$ or $(j-i)$, two-way symmetrical, $c_{ij} = c_{ji}$ and $t_{ij} = t_{ji}$, two-way asymmetric $c_{ij} \neq c_{ji}$ or $t_{ij} \neq t_{ji}$

ALGORITHMS AND ILLUSTRATIVE EXAMPLES

Example 1. Closed model, 5 two-way asymmetric communications

$$n = 7, \quad [p] = [50, 70, 0, 0, 0, -30, -90]$$

$$(1) \min C(x) = \sum_{(i,j)} c_{ij} \cdot x_{ij}$$

Matrix Form, The Unit Costs c_{ij} [m.u.]

From \ To	S1	S2	T1	T2	T3	D1	D2	Supply
S1		1	3	2				50
S2	2			4	7			70
T1				2	6	5		0
T2			3		1	7	9	0
T3			8	2		8	6	0
D1								-30
D2							2	-90
Demand	0	0	0	0	0	0	0	

Matrix Form, The Variables $x_{ij}[t]$

x_{ij}	S_1	S_2	T_1	T_2	T_3	D_1	D_2
S_1	\	x_{12}	x_{13}	x_{14}	—	—	—
S_2	x_{21}	\	—	x_{24}	x_{25}	—	—
T_1	—	—	\	x_{34}	x_{35}	x_{36}	—
T_2	—	—	x_{43}	\	x_{45}	x_{46}	x_{47}
T_3	—	—	x_{53}	x_{54}	\	x_{56}	x_{57}
D_1	—	—	—	—	—	\	x_{57}
D_2	—	—	—	—	—	x_{76}	\

$$\min C^{(1)} = C^{(1)*} = 1,190 \text{ (m.u.)}$$

Graphic Solutions

Alternative solutions

$$x_{ij}^{(1.1)*}, x_{ij}^{(1.2)*}$$

Consequences, values of other criteria

$$T_{TE}^{(1.1)} = 43.380$$

[tonnes-min]

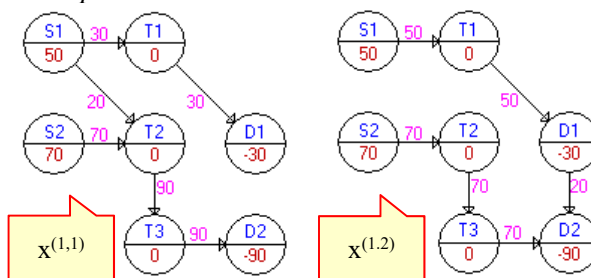
$$T_{TE}^{(1.2)} = 48.180$$

[tonnes min]

$$T^{(1.1)} = 894 \text{ [min.]}$$

$$T^{(1.2)} = 912 \text{ [min.]}, t^{(1.1)} = t_{36} = 300 \text{ [min.]} = t^{(1.2)}$$

$$q^{(1.1)} = x_{36} = 30 \text{ [t]} = q^{(1.2)} = 30 \text{ [t]}$$



Marginal alternatives. All solutions are determined by their linear combination with $\alpha \in [0,1]$

$$x^{(1)} = \alpha x^{(1.1)} + (1 - \alpha) x^{(1.2)}$$

$$(2) \min T_{ET}(x) = \sum_{(i,j)} t_{ij} x_{ij}$$

The Times t_{ij} (minutes)

From \ To	S1	S2	T1	T2	T3	D1	D2	Supply
S1		60	162	108				50
S2	66			90	60			70
T1				120	210	300		0
T2			150		114	66	90	0
T3			240	144		132	120	0
D1							126	-30
D2						150		-90
Demand	0	0	0	0	0	0	0	

$$\min T_{ET}^{(2)} = T_{ET}^{(2)*} = 21,780 \text{ [t-min]}$$

Alternative solutions

$$C^{(2.1)} = 1,400 \text{ [m.u.]}, C^{(2.2)} = 1,610 \text{ [m.u.]}$$

$$T^{(2.1)} = 444 \text{ [min]}, T^{(2.2)} = 324 \text{ [min]}$$

$$t^{(2.1)} = t_{37} = 120 \text{ [min]}, t^{(2.2)} = t_{14} = 108 \text{ [min]}$$

$$q^{(2.1)} = x_{37} = 70 \text{ [t]}, q^{(2.2)} = x_{14} = 50 \text{ [t]}$$

$$(3) \min T(x) = \sum_{(i,j)} (t_{ij} | x_{ij} > 0), [12]$$

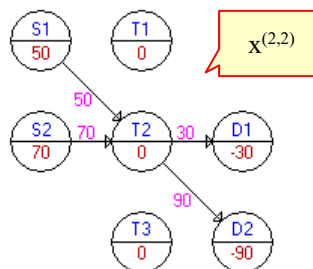
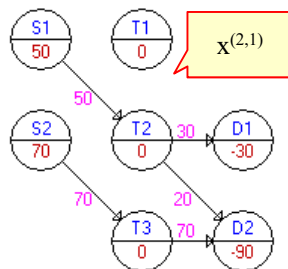


Table 1. Iteration 1 Selection of the starting solution $x^{(3,1)}$ by the diagonal method

			1	2	3	4	5	6	7		$\sum t_{ij}$	$\max t_{ij}$	$\sum c_{ij}x_{ij}$
			S ₁	S ₂	T ₁	T ₂	T ₃	D ₁	D ₂	p	$x_{ij} > 0$	$x_{ij} > 0$	
1	S ₁	t _{1j}	M	60	16 2	108	M	M	M		60	60	50
		x _{1j}		[50]						50			
2	S ₂	t _{2j}	66	M	M	90	60	M	M		150	90	690
		x _{2j}				[50]	[70]			70			
3	T ₁	t _{3j}	M	M	M	120	210	300	M		0	0	0
		x _{3j}											
4	T ₂	t _{4j}	M	M	15 0	M	114	66	90		114	114	50
		x _{4j}					[50]– δ	+δ					
5	T ₃	t _{5j}	M	M	24 0	144	M	132	120		252	132	780
		x _{5j}						[30]– δ	[90]				
6	D ₁	t _{5j}	M	M	M	M	M	M	126		0	0	0
		x _{5j}											
7	D ₂	t _{5j}	M	M	M	M	M	150	M		0	0	0
		x _{5j}											
-p								30	90		576 T ^(3,1)	132 t ^(3,1)	1.57 0 C ^(3,1)

Source: authors

Iteration 2 Optimization testing and improvement of non-optimal solution.

• *Definition 1.* The solution is optimal if there are no non-base variables with a negative increment in the total time.

• *Definition 2.* The total time increment is equal to the difference between the time of the variable that becomes base and the time of the variable that becomes non-base.

$$\begin{array}{l|l} x_{46}^{(3,1)} = 0, & x_{46}^{(3,2)} = \delta > 0 \\ x_{45}^{(3,1)} = 50, & x_{45}^{(3,2)} = x_{45}^{(3,1)} - \delta = 50 - \delta > 0 \Rightarrow \delta \leq 50 \\ x_{56}^{(3,1)} = 30 & x_{56}^{(3,2)} = x_{56}^{(3,1)} - \delta = 30 - \delta > 0 \Rightarrow \delta \leq 30 \end{array} \quad \Rightarrow \begin{array}{l} x_{46}^{(3,2)} = \delta = 30 \\ x_{45}^{(3,2)} = 20 \\ x_{56}^{(3,2)} = 0 \end{array}$$

$$\begin{array}{l|l} \Rightarrow \Delta T^{(3,2)} = t_{45} - t_{56} = 66 - 132 = -66 \\ T^{(3,2)} = T^{(3,1)} + \Delta T^{(3,2)} = 576 + (-66) = 510 \\ 510 \end{array} \quad \left| \begin{array}{l} \text{The solution } x^{(3,1)} \text{ is not optimal due to} \\ \Delta T^{(3,2)} = -66 < 0 \end{array} \right.$$

- New base $x_{46}^{(3,2)} = 30$ determines non-base $x_{56}^{(3,2)} = 0$ and better $x^{(3,2)}$ with $T^{(3,2)} < T^{(3,1)}$.

$$\begin{array}{l|l} \text{The unit cost increment is} & \Delta C^{(3,2)} = -c_{45} + c_{46} - c_{56} = -1 + 7 - 8 = -2 \\ \text{determined by } c_{ij} \text{ for all } x_{ij} \text{ as} & C^{(3,2)} = C^{(3,1)} + \Delta C^{(3,2)} \cdot \delta = 1.570 + (-2) \cdot 30 = \\ \text{modified.} & 1.510 \end{array}$$

Table 2. $x^{(3,2)}$ Lower total costs incurred $C^{(3,2)} < C^{(3,1)}$

			1	2	3	4	5	6	7	p	$\sum t_{ij}$	$\max t_{ij}$	$\sum c_{ij}x_{ij}$
			S ₁	S ₂	T ₁	T ₂	T ₃	D ₁	D ₂		$x_{ij} > 0$		
1	S ₁	t _{1j}	M	60	162	108	M	M	M		60	60	50
		x _{1j}		[50]						50			
2	S ₂	t _{2j}	66	M	M	90	60	M	M		150	0	690
		x _{2j}				[50]	[70]			70			
3	T ₁	t _{3j}	M	M	M	120	210	300	M		0	0	0
		x _{3j}											
4	T ₂	t _{4j}	M	M	150	M	114	66	90		180	115	230
		x _{4j}					[20]	[30]					
5	T ₃	t _{5j}	M	M	240	144	M	132	120		120	129	540
		x _{5j}							[90]				
6	D ₁	t _{5j}	M	M	M	M	M	M	126		0	0	0
		x _{5j}											
7	D ₂	t _{5j}	M	M	M	M	M	150	M		0	0	0
		x _{5j}											
p								30	90		510	132	1.510

Source: authors

This is followed by repeating the process of testing the optimality of the solution and improving it if it is not optimal. The process is interrupted when there are no negative increments in total time.

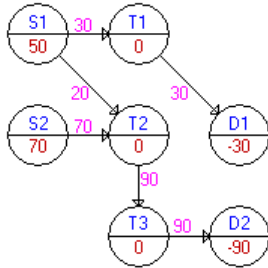
$$(1) (4) \min \left\{ C = \sum_{(i,j)} c_{ij} x_{ij}, t = \max (t_{ij} \mid x_{ij} > 0) \right\}$$

Iteration 1. Step 1. min

Table 3. Times t_{ij} (min).

Marked fields (i,j) with $x_{ij} > 0$

C



$$x^{(4,1)} = x^{C*}, C^{(4,1)} = C^*$$

		1	2	3	4	5	6	7	max t_{ij}	$\sum$ t_{ij}
	t_{ij}	S ₁	S ₂	T ₁	T ₂	T ₃	D ₁	D ₂	$x_{ij} > 0$	x_{ij}
1	S ₁		60	162	108				162	270
2	S ₂	66			90	60			90	90
3	T ₁				120	210	300		300	300
4	T ₂			150		114	66	90	114	114
5	T ₃			240	144		132	120	120	120
6	D ₁							126	-	-
7	D ₂						150		-	-
Source: authors									300	894

Step 2 Estimate of the longest time

$$t^{(4,1)} = \max \{ 162, 108, 90, 300, 114, 120 \} = 300 [\text{min}] = t_{36}$$

$$\text{Consequences on other criteria: } T^{(4,1)} = 894 [\text{min}], q^{(4,1)} = x_{36} = 30 [t]$$

$$\text{The first Pareto solution was obtained } \{ x^{(4,1)}, C^{(4,1)}, t^{(4,1)}, q^{(4,1)} \}$$

Step 3 Interdiction of communication (i,j) with $t_{ij} \geq t^{(4,1)} = 300$ and repeating the process of $k=1$.

Unit costs adjustment:

$$c_{ij}^{(4,2)} = \infty \text{ za } t_{ij} \geq t^{(4,1)} = 300, \text{ only communication } (3,6) \text{ with } t^{(4,1)} = 300$$

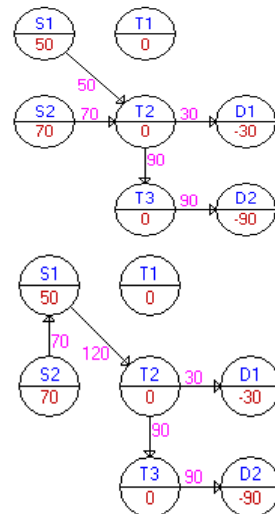
$$c_{ij}^{(4,2)} = c_{ij} \text{ for } t_{ij} < t^{(4,1)} = 50$$

Iteration 2 Step 1 min $C^{(4,2)}$

From \ To	S1	S2	T1	T2	T3	D1	D2	Supply
S1		1	3	2				50
S2	2			4	7			70
T1				2	6			0
T2			3		1	7	9	0
T3			8	2		8	6	0
D1							1	-30
D2						2		-90
Demand	0	0	0	0	0	0	0	

Step 2 Alternative solutions $x^{(4,2,1)}$ and $x^{(4,2,2)}$

- The continuation of the solution process indicates that the problem has 6 Pareto-optimal solutions.



- Basic Pareto solution property: Better value for one criterion requires worse value for at least one of the remaining criteria.

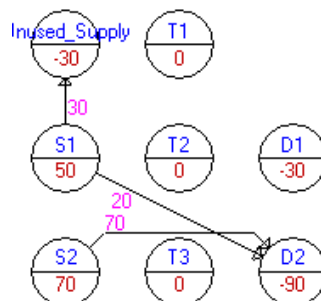
Table 4. Consequence of pareto optimal solutions

Iter.	Solution	C[m.u.]	T [min]	t [min]	q [t]	Properties
1	$x^{(4.1.1)}$	1,190	894	$t_{36} = 300$	$x_{36} = 30$	$\min C = 190 \Rightarrow \max t = 300$
	$x^{(4.1.2)}$		912			
2	$x^{(4.2.1)}$	1,220	460	$t_{47} = 120$	$x_{47} = 90$	$C^{(4.2)} > C^{(4.1)} \Rightarrow t^{(4.2)} < t^{(4.1)}$
	$x^{(4.2.2)}$		474			
3	$x^{(4.3.1)}$	1,400	330	$t_{14} = 108$	$x_{14} = 120$	$C^{(4.3)} > C^{(4.2)} \Rightarrow t^{(4.4)} < t^{(4.2)}$
	$x^{(4.3.2)}$		354		$x_{14} = 50$	
4	$x^{(4.4)}$	1,550	306	$t_{24} = t_{47} = 90$	$x_{24} + x_{47} = 120 + 90$	$\min t = 90 \Rightarrow \max C = 1,550$

Source: authors

Iteration 5. $c_{ij}^{(4.5)} = \infty$ for $t_{ij} \geq t^{(4)} = 90$

From \ To	S1	S2	T1	T2	T3	D1	D2	Supply
S1		1						50
S2	2				7			70
T1								0
T2							9	0
T3								0
D1								-30
D2								-90
Demand	0	0	0	0	0	0	0	



Inadmissible solution is determined $x^{(4.5)}$ that uses prohibited solutions

$S_1 \rightarrow D_2$

$S_2 \rightarrow D_2$

The solution process has been completed. It is noted that the software does not use prohibited communications up to D_1 and thus does not download 30[t] from the supply 50[t] at S_1 .

$$(5) \min q(x) = \sum_{(i,j)} (x_{ij} \mid t_{ij} = t^* = t^{(4.4)} = 90)$$

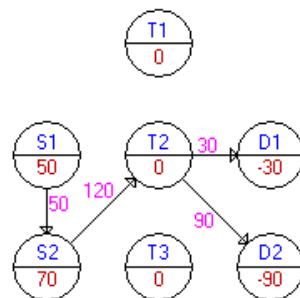
Modification of the model in order to divert transport as much as possible to communications with times less than t^* :

$$c_{ij}^{(5)} = 1 \text{ for } t_{ij} = t^*, c_{ij}^{(5)} = 0 \text{ za } t_{ij} < t^*, c_{ij}^{(5)} = \infty \text{ for } t_{ij} > t^*$$

It is determined $x^{(4)}$ solution $t^* = t^{(4)} = t_{24} = t_{47} = 90[\text{min}]$

$$q^* = q^{(4)} = x_{24} + x_{47} = 120 + 90 = 210[\text{t}]$$

From \ To	S1	S2	T1	T2	T3	D1	D2	Supply
S1		0						50
S2	0			1	0			70
T1								0
T2						0	1	0
T3								0
D1								-30
D2								-90
Demand	0	0	0	0	0	0	0	



Remark 1 Communication restrictions or other additional conditions may impair the criteria values shown. Illustrations for alternative solutions with $C^{(1)*} = 1,190$ [m.u.].

- It is optimal to transport $x_{13} \in [30, 50]$ from Od S₁ to T₁. If the capacity of this communication is limited to 10 [t] it is obtained then $x_{13} = 10$ [t] and $C = 1,210$ [m.u.] $> C^{(1)*}$.
- Communication $T_2 \rightarrow D_1$, is not used because $x_{36} = 0$. Condition $x_{36} \geq 25$ [t] sets $x_{36} = 25$ [t] and increases $C^{(1)*}$ to 1.215 [m.u.].

Remark 2 It is useful to consider the Range of Optimality and the Range of Feasibility (in the environment of the optimal solution), as well as Perform Parametric Analysis (considering the permissible values of c_{ij} unit cost or the characteristics p_i for the nodes in the model).

CONCLUSION

This paper outlined five criteria for the general problem of network transport and presented CNF solution algorithms from WinQSB software by considering a hypothetical example of a closed problem. The exhibited models need to be expanded to cover at least two types of cargo to more effectively describe practical problems. It can also be justified that, in practice, more important are the problems with vehicles, which are more complex to model and solve using Linear and Integer Programming. Moreover, if further consideration is given to vehicle types of different capacities, which is also more prevalent in practice.

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LOKALNI MEDIJI U KORONA KRIZI: ZNAČAJ I IZAZOVI NA PRIMJERU POŽEŠKOG 034 PORTALA

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Sažetak: *Sa pojavama kriza, posebice onih na globalnoj razini, koje uzrokuju nove i do sada neobjašnjive pojave, sa značajnim stupnjem neizvjesnosti u pogledu trajanja i posljedica, kao što je slučaj sa epidemijom bolesti COVID-19, javljaju su nove i različite potrebe šire javnosti u pogledu informiranja u kriznim situacijama i to: o načinima prevencije, zaraze, liječenju te svemu onome što može dovesti do zauzdavanja ove opake bolesti. No, ogroman broj različitih informacija, s raznih razina, može izazvati tzv. infodemiju (poplavu informacija sumnjive vjerodostojnosti). Ciljevi rada su: identifikacija jednog od bitnih segmenata upravljanja krizom, a to je krizno komuniciranje u uvjetima epidemije, stupnjevanje procesa upravljanja krizom prema recentnoj literaturi, identifikiranje nositelja kriznog komuniciranja na državnoj i lokalnoj razini, ocjena njihova uspjeha u pogledu nošenja s krizom na planu kriznog komuniciranja, ulogu i značaj lokalnih - mikro medija, te metodom studije slučaja, kroz analizu sadržaja istražiti i ispitati ulogu i značaj lokalnih digitalnih medija na primjeru – Požeškog 034 Portala. Odnosno da li je isti kroz izvješćivanje javnosti, doprinio općem društvenom interesu ili je djelovao senzacionalistički i populistički i time izazivao strah i uznemirenost kod građana Požeštine. Rezultati istraživanja upućuju na to da su građani u vremenu epidemije češće koristili digitalne medije i tragali za informacijama o krizi, posebice kada je broj oboljelih bio na najvišoj razini. Istovremeno, došlo se i do zaključka da je 034 Portal informacije o krizi široj javnosti prezentirao izbjegavajući senzacionalizam, dajući prostor vijestima i preporukama lokalnog i nacionalnog stožera, liječnicima, epidemiolozima, te time u lokalnoj zajednici nije doprinio ionako složenoj situaciji povodom ovog javno zdravstvenog problema.*

Ključne riječi: mediji; krizno komuniciranje; kriza; bolest.

JEL klasifikacija: H12.

UVOD

Kriza koju je prouzročio korona virus, brzo je promijenila neke ustaljene obrasce, navike i procedure u našem životu. Možda kao na malo kojem drugom području ta se kriza posebno osjetila u komunikaciji, i to na najrazličitijim razinama, odnosno područjima, posebice u medijima i njihovom radu. Cjelokupni medijski sustav, ne samo u nas, nego i u svijetu, doživio je znatnije promjene. Nije bilo posebnoga vremena pripreme, a mediji su se morali prilagoditi novim okolnostima, nastojeći odgovoriti na nove izazove, od organizacijskih (24-satno izvješćivanje), stručnih (područje koje je do sada rijetko bilo zastupljeno u medijima), do kontinuiranog traganja i filtriranja nebrojenih miliona vijesti vezanih za krizu duž čitavog svijeta.

Kako u Požeško-slavonskoj županiji, Hrvatskoj tako i u mnogim zemljama, kada je riječ o medijima, prvo se uočava činjenica da su se mnogi građani za vrijeme krize učestalije služili medijima, čemu je prvi uzrok niz nepoznanica i potreba za informiranjem, a potaknuto zahtjevima vlasti za ograničenjima u pogledu kretanja, izolacije, zabrane rada društvenih objekata, što je ljude dovelo do medija, ali i usmjerenje đaka i studenata na e-nastavu uz koju su putem Interneta tragali i za informacijama vezanim za korona krizu.

Nikada u povijesti čovječanstva tako golema količina informacija nije bila toliko dostupna, da uz nekoliko klikova mišem možemo doznati što se zbiva u bilo kojem kutku svijeta. No, pandemija korona virusa i njeno praćenje suvremenim komunikacijskim tehnologijama osim bolje informiranosti dovela je građane u opasnost od dezinformiranosti, izazivanja straha, preporuke za primjenu nedokazanih metoda liječenja, prognoza za trajanje epidemije i liječenje oboljelih koje nisu znanstveno utemeljenje. Uz navedeno, svojevrsno nesistematsko i netočno informiranje i bombardiranje informacijama sa svih krajeva svijeta koji su u različitim okolnostima i načinima prevencije, te oblicima suzbijanja, u bitnome različite od naših prostora, značajno su doprinijele u najmanju ruku zabrinutosti građana koja nije imala opravdanje. Isticanje samo broja oboljelih primjerice, bez broja izliječenih, ne isticanje gotovo beznačajnih simptoma bolesti kod značajnog broja oboljelih, bio je problem kojim se susrelo niz zemalja, pa i Hrvatska, što je dijelom zasluga i medija i aktualne politike koja vodi ovu borbu. No, mediji ponekad nisu niti imali drugog izbora, naime često su i od samih nositelja borbe protiv pandemije stizale kontradiktorne preporuke (maska-da-ne; okupljanje u crkvi i procesija da, kino ne, u BIH se može u Srbiju ne itd.). Fotografije Španjolskih i Talijanskih bolnica kontinuirano su kolale TV kanalima, a istovremeno, prilozi iz Njemačke, Švedske ili Švicarske koje su se u početku epidemije očito uspješno borile protiv pandemije stizale su rijetko.

Na pojavu „infodemije“ upozorio je i čelnik WHO-a Tedros Adhanom Ghebreyesus još na početku pandemije pri čemu se „infodemija“, može opisati kao poplava informacija, dezinformacija i uznemirujućih teorija zavjera. Bile točne ili netočne, prekomjerne količine informacija mogu imati negativan utjecaj na zdravlje ljudi, povećati stres i potaknuti ih da prihvate potencijalno opasne savjete, navodi WHO. Nikada nije bilo jasnije da je komunikacija važna intervencija za javno zdravstvo koja doprinosi kontroli pandemije, uz epidemiologiju, virologiju i kliničku praksu, priopćio je WHO. No, nejasne i obmanjujuće informacije mogu „ugroziti povjerenje“ u zdravstvene vlasti, upozorila je agencija tada. Najštetniji aspekt infodemije bile su pogrešne i obmanjujuće informacije koje su iznosili akteri izvan zdravstvenog područja. To je

dovelo do širenja opasnih i neutemeljenih tvrdnji, istaknuo je WHO. (Nacional, 2020)

Hrvatska je prvi slučaj zabilježila krajem mjeseca veljača 2020., nakon njega njih nekoliko, pa je shodno tome država intervenirala, (vrhunac je za sada dosegnut u listopadu 2020., kada je dnevni broj prešao 500), osnivanjem zasebnog stožera, koje je uz ostale mjere, a vezano za temu ovog rada, zajedno sa članovima vlade održao radni sastanak s vlasnicima medija, čiji su zaključci (a posebice dogovori) i dan danas izvan dosega javnosti. (INDEXHR, 2020). No, prema medijskim natpisima, Vlada je pokušala obećanjima o pomoći medijima u kriznom razdoblju (manje reklamnih i promidžbenih sadržaja-više posla) doći do konkretnog i korektnog izvješćivanja o stanju u svezi pandemije i mjerama koje Vlada i stožer poduzimaju, što uzimajući razinu EU čija je članica RH-a, u najmanju ruku neuobičajen potez za vlasti u EU.

Epidimijom je stožer da tako kažemo vladao od veljače, kroz restriktivne mjere, zatvaranja, u ožujku, travnju, postepenim otvaranjem nakon toga, te pokušajem spašavanja gospodarske situacije turističkom sezonom i gotovo potpunim otvaranjem, koje je na žalost dovelo do velikog broja oboljelih u kolovozu, rujnu i listopadu i izbijanje među 5 zemalja sa najviše oboljelih u EU na 100.000 stanovnika. Medijske konferencije gotovo su svakodnevne i to čelnog stožera i lokalnih, krize unutar krize (smrt u domu u Splitu, crkvene aktivnosti) vrlo brzo „gaze“ nove vijesti, no ipak Split izbija u kolovozu na prvo mjesto po oboljelima, što zasigurno ima uzrok u ranijim djelovanjima.

Požeško-slavonska županija, prostorno smještena u zapadnoj Slavoniji, a posebice prostor Požeštine, koji je prirodno omeđen planinama, uglavnom je ruralno područje, sa manjim brojem stanovnika (procjena oko 50,000 tisuća), do kraja ožujka 2020., nije imala oboljelih, a prvi registrirani evidentiran je 27. ožujka 2020. U vrijeme izrade rada, Požeško-slavonska županija, ukupno je prema podacima HZZJZ evidentirala 130 oboljelih ili 6.4% od ukupno njih 8.530 u RH. Od ukupno 20 županija i grada Zagreba, Požeško-slavonska županija se tako prema broju oboljelih, nalazila tada na 16 mjestu (najveći broj oboljelih je na području grada Zagreba), te se udjel oboljelih kretao na toj razini kroz dosadašnji period epidemije. U tim vremenima građani o epidemiji doznaju od nacionalnih medija, te lokalnih i to dvije radije postaje jednog lokalnog tiskanog tjednika i nekoliko web - Internet portala. Stožer se na županijskoj razini formira po usložnjavaju situacije, on komunicira sa medijima informacije o oboljelima, te iznosi savjete, zabrane i preporuke. U tim uvjetima predmet ovog istraživanja lokalni 034 Portal koji je ujedno i najčitaniji, bilježi svoj najveći broj gledanosti-posjeta. Uz stranice na kojima se objavljuju vijesti, 034 Portal, posjeduje i ažurira stranice na facebooku, na kojoj se građanima omogućava da dijele vijesti portala, ali i da komentiraju vijesti, odnosno opisane događaje u njima. Cilj ovog istraživanja je proučiti na koji način lokalni digitalni medij 034 Portal utječe na upravljanje informacijama u kriznim situacijama.

METODOLOGIJA ISTRAŽIVANJA

Predmet istraživanja ovog rada bio je krizno komuniciranje i uloga lokalnih digitalnih medija u vrijeme epidemije Corona virusa i ispitivanje doprinosa kriznom komuniciranju u lokalnoj zajednici 034-Portala.

Cilj rada je ispitati jesu li građani bili zasuti (i neprovjerenim) putem navedenog medija informacijama o epidemiji ili su one bile dozirane sukladno stanju i broju obo-

ljelih i opasnostima koje su prijetile, kojim izvorima (stožerima, svojim zapažanjima ili neprovjerenim), je portal poklanjao više prostora i prenosio njihove informacije, jesu li korištene riječi u tekstovima bile one koje potiču strah, neizvjesnost ili suprotno tome, te kakav stav su na osnovu članaka putem komentara na društvenim mrežama zauzimali građani. Odnosno je li portal ispunio svoju zadaću u pogledu kvalitetnog informiranja građana u krizi.

Za dobivanje rezultata, korištena je opća metoda i to metoda studije slučaja, a kao pomoćna metoda analize sadržaja, kojom je analizirano ukupno sedam grupa pokazatelja iz kojih se moglo kvalitetno izvesti zaključak istraživanja.

KRIZA I KRIZNE SITUACIJE

Kriza (njemački: krise, latinski: crisis, grčki: krisis), označava opasnost, odlučivanje, preokret, odnosno sama riječ odnosi se na promišljanje situacije, prosuđivanje situacije, te na temelju istih procjene mogućnosti u pogledu djelovanja. Koristi se kada se u nekom području, (zdravstvu, pravosuđu, politici, gospodarstvu, odnosno između država itd.) pojavi nesigurna, nestabilna, te teže upravljana uobičajenim načinima situacija. (Ivanović, 2014)

U rječniku hrvatskog jezika, autora Vladimira Anić, krizu opisuje kao vrlo teško stanje koje može rezultirati rješanjem problema ili katastrofom. (Anić, 1991)

Krize i krizne situacije, danas smo svjedoci mogu dogoditi u svim dijelovima svijeta, neovisno o stupnju društvenog napredaka, gospodarskog i drugog razvoja, jer pandemija ne bira područja, a općenito mogu zahvatiti veća područja na zemaljskoj kugli, pojedine države, dijelove društva ili pojedince.

Kriza, općenito, a pandemija bolesti COVID-19, to najbolje potvrđuje dolaze neočekivano i vrlo često kada ugroženi pojedinci ili zajednice su na njih najmanje spremne, ili uopće nemaju alata (cjepivo) za borbu protiv istih kao u slučaju COVID-19. Upravljanje krizom podrazumijeva strukturirane i organizirane odgovore na krizu, a s obzirom na kompleksnost kriznih situacija, postoji mnoštvo definicija istih. (Mihalinić, 2018)

Nastala globalna kriza izazvana bolesti COVID-19, uz mnogobrojne oboljele i preminule građane diljem svijeta, za sobom otvara i vrata najveće ekonomske krize u novijoj povijesti, te očigledne, nove globalne podjele i rast/pad utjecaja pojedinih zemalja u svijetu (one koje imaju cjepivo i bolje se nose s krizom), po definiciji je globalna, svjetska, društvena kriza sa jakim utjecajem na pojedince koji se nalaze na području epidemije. I ova kriza iskazuje se i na društvenoj i osobnoj (individualnoj) razini. Na planu društva, ova kriza zbog nužnih ograničenja u kretanja, obavljanju svakodnevnih poslova, te značajnih resursa koje treba koristiti na njenom suzbijanju, je prijetnja za ključne državne sustave i vrijednosti (ograničena su brojna prava zagaran-tirana čak i Ustavom). Na osobnoj razini izazvala je povećanu napetost, stres, bojazan za osobno i zdravlje obitelji, poznanika, suspendirala razne slobode i prava koja imaju značajan psihološki utjecaj na sve građane, te je u teškoj mjeri omela normalan rad i djelovanje pojedinca u zajednici.

Krizu izazvanu pandemijom bolesti COVID-19, i danas, gotovo nakon godinu dana od izbijanja, obilježava neizvjesnost u pogledu uzroka koji su je izazvali, nepoznato je, i je li virus nastao prirodnim putem ili djelovanjem čovjeka, razvoj niza pod sojeva koji postaju imuni na cjepivo, koje je odobravano po žurnoj proceduri,

nameće neizvjesnost u pogledu toga kako će se dalje razvijati ova kriza i koje će posljedice zbog nje nastati. Ograničenja aktivnosti u društvu, vezana za sprječavanje širenja pandemije, direktno utječu na ekonomije širom svijeta, a neizvjesnost na oba plana, uzrokuju nedvojbeno krizu širih razmjera, čije će se posljedice dugoročno otklanjati. I mediji, kao dio društva, susreli su se s novim izazovima tijekom ove krize i imaju u suvremenom svijetu neizostavnu ulogu koja se treba usmjeravati na izvješćivanje koje će doprinijeti kvalitetnom informiranju građana o kretanjima stanja krize, mjerama koje zajednica poduzima, a posebnu ulogu mediji moraju imati u prijenosu preventivno-edukativnih sadržaja i poruka kojima se smanjuje neizvjesnost, strah i potiče samo zaštitno ponašanje kod građana.

UPRAVLJANJE KRIZAMA

Upravljanje krizama, je proces u kojem društvo i pojedinci upravljaju rizicima, kako bi se izbjegle, ublažile i otklonile posljedice kriza, koje nastaju zbog istih, te povrat u stanje prije krize sa najmanje posljedica, što je posebno važno kod pandemije bolesti COVID-19. Kompletan proces upravljanja krizom preuzima krizni menadžment (u slučaju RH državni i lokalni stožeri) koji planiraju i poduzimaju aktivnosti i mjere na planu zaštite građana od pandemije, odnosno minimiziranja posljedica iste po društvo.

Kako bi upravljanje krizama bilo funkcionalno i uspješno, te se ugrožavanje društva i pojedinaca svelo na što manju moguću mjeru, pravovremeno reagiranje i kvalitetan krizni menadžment su ključni. Izostanak ili neadekvatno postupanje vezano uz kriznu situaciju može imati niz negativnih posljedica. Uspješno djelovanje i rad kriznog menadžmenta ima za preduvjete uključivanje u isti stručne i kvalificirane menadžere, a temelji se na suradnji i timskom radu, kvalitetnoj, efikasnoj i brzom komunikaciji, brzom donošenju ključnih odluka te na učinkovitom upravljanju informacijama. (Mihalinić, 2018)

Brza komunikacija, izuzetno je važna u odnosu menadžment-(stožeri)-mediji-građani, jer putem nje građani pravovremeno dobivaju preporuke, naredbe i obavijesti koje trebaju biti razumljive, životno provedive i sa jasno istaknutim ciljem kojim se želi postići tim mjerama. Istovremeno, mediji imaju i značajnu ulogu, (trebaju je imati), kao korektori koji će prvi ukazati na određene nelogičnosti i besmisao pojedinih mjera, (npr. zabrana kretanja na pojedinim područjima blisko vezanim gospodarskim ili prometnim poveznicama koje dodatno usložnjavaju krizu, povećavaju administriranje itd.).

Proces upravljanja krizom podrazumijeva sljedeće:

1. Izučavanje i proučavanje karakteristika i stanja krize,

2. Analiziranje uzroka i posljedica kriznog događaja,

3. Izradu plana svladavanja krize (s obzirom na: društvene interese; uvjete za povećanje životnog standarda i razvoja društva, gospodarstva, kulture, obrazovanja, zdravstva te socijalne zaštite; praćenje javnih troškova; slobodu pojedinaca; osjetljiva pitanja i aktualne društvene probleme; političko stanje),

4. Kontrolu krizne situacije,

5. Uspostavljanje mirne društvene situacije. (Galtung, 2009)

U slučaju korona krize u Hrvatskoj, s gledišta stanja u mjesecu kolovozu 2020.,

možemo zaključiti da je proces tek konzumirao točku 1., djelomično točku 2., a gotovo uopće nisu ispunjene točke 4., i 5., dok je točka 3., tek djelomično po pojedinim stavkama realizirana, ali nema plana za čitav spektar društvenih interesa, o čemu po-najbolje svjedoče i inicijative za ukidanje državnog stožera i najave prosvjeda protiv njegovih mjera.

KRIZNO KOMUNICIRANJE

Krizno komuniciranje dio je kriznog menadžmenta, a njegov cilj je informiranje javnosti o svakom aspektu krize. Podrazumijeva aktivnosti subjekata koje je zahvatila kriza na planu razmjene informacija, kako bi se minimizirao i sveo na najmanju mjeru utjecaj krize na subjekt ili zajednicu. To je planska i ciljana aktivnost usmjerena na ciljane skupine.

U uvjetima pandemije i bolesti COVID-19 i krize koju je izazvala i koja prijeti javnom zdravstvu, te ekonomiji, krizno komuniciranje možemo definirati kao aktivnost državnih i lokalnih vlasti (stožera u koje su uključeni stručnjaci, liječnici, epidemiolozi,) usmjerena prema javnosti, kojem je cilj informiranje građana o stanju u zajednici, broju oboljelih, simptomima, smrtnosti, broju izliječenih, mjerama koje stožer provodi s posebnim naglaskom na mjere prevencije.

Za te potrebe, stožer je zajedno s vladom RH, sadržajem, formom i vremenskim planiranjem kriznog komuniciranja pokušao utjecati na smanjenje štete ili pogoršanje situacije. A pri tome je u prvom redu provodio dnevne tiskovne konferencije, izdavao priopćenja, te na stranicama Civilne zaštite omogućio građanima uvid u podatke o kretanju broja oboljelih.

Kada je riječ o zdravstvenoj prijetnji kao u slučaju pandemije i bolesti COVID-19, krizno komuniciranje treba definirati i javnosti prenijeti podatke o pojavnim oblicima bolesti, njenom širenju, broj oboljelih po regijama, realnu sliku opasnosti po građane, mjere prevencije, mjere zabrane i ograničenja, te preporuke za samo zaštitno ponašanje i korištenje zaštitne opreme (maske, rukavice itd.). To posebice u početcima pandemije, nije bilo uspješno što je polučilo različita tumačenja i ponašanja kod građana, a do kojih je došlo zbog različitih izjava članova stožera, liječnika ili drugih uključenih u proces borbe protiv epidemije. Važna komponenta kriznog komuniciranja i upravljanja informacijama u kriznim situacijama je komunikacija sa medijima i razumijevanje medija i njihove „gladi“ za informacijama. Veći broj istraživanja i promatranja današnjeg način života (sveopća informatizacija i dostupnost medija) vezan za krizna komuniciranja, došao je do pokazatelja da građani u odnosu na prijašnja vremena, sve više koriste informacije koje prenose mediji i stvaraju sliku o svemu iz istih, pa tako i o krizama, te je tako suradnja nositelja kriznog komuniciranja s medijima od izuzetne važnosti. Mediji u vrijeme epidemija igraju ključnu ulogu u komuniciranju zdravstvenih rizika i preporuka široj javnosti. Oni su informacijska spona između stožera (javnih vlasti) i građana, ali i donositelj informacija iz ostalih područja svijeta, mišljenja neovisnih liječnika, epidemiologa i stručnjaka, te su u današnje doba najznačajniji čimbenik poimanja opsega krize i kreiranja stava o istoj od strane javnosti. Iako mediji često zbog naklade i prestiža posežu za senzacionalizmom i neprovjerenim informacijama, stožeri i javna uprava, trebaju na tom pravcu djelovati sa pravovremenim i kvalitetnim kriznim komuniciranjem, biti dostupni, te pružiti dostatan broj kvalitetnih i provjerenih informacija, te izložiti logične zahtjeve i ograničenja koje se

postavljaju, kako bi se izbjegao negativan stav, strah i panika kod građana. (Reynolds & Seeger, 2012).

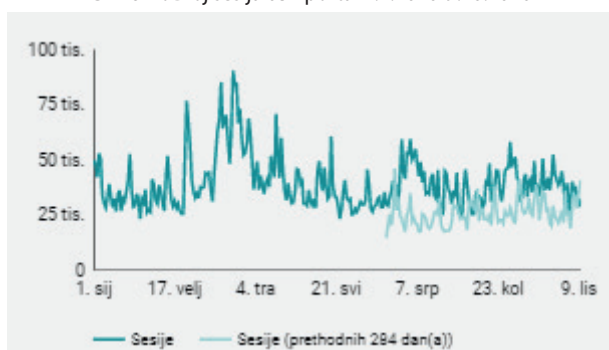
ULOGA DIGITALNIH MEDIJA POPUT 034 PORTALA U KRIZAMA

Već je navedeno da je 034 Portal duži niz godina vodeći web portal na prostoru Požeško-slavonske županije, 224 u RH i 80.968 u Svijetu, na rang listi Smilarweb koji uz vijesti na Internet portalu iste distribuira široj javnosti i putem facebook stranice na kojoj je omogućeno dijeljenja vijesti i komentiranja istih široj društvenoj zajednici. Portal svoju najveću čitanost bilježi na prostoru Požeško-slavonske županije, te nekoliko okolnih, ali sve više i izvan granica Hrvatske i to kod građana Požeštine koji su na privremenom radu u inozemstvu, te koji kao i svi iz minute u minutu putem raznih uređaja o računa do mobilnih telefona pristupaju portalu i doznaju vijesti iz Požeštine. Broj web (internetskih) portala i njihova popularnost, te praćenje od građana, raste svakodnevno, posebice u krizama kakva je pandemija, a ranije uobičajeni načini informiranja (TV, radio, novine), bilježe gubitak primata nad njima, te se i najpoznatije medijske kuće danas za brzo i dostupno informiranje građana putem web-a.

Model strukturiranog informiranja od vlasti ili agencija, u kojem je bilo određeno što će se i kada priopćiti javnosti, danas više ne egzistira u većini zemalja suvremenog svijeta, te je sve više prisutan model u kojem se informacije dijele od osobe do osobe, potpuno slobodno bez ograničenja. Tako je jasno da danas uopće više nije pitanje treba li web portale i aplikacije koristiti za informiranje, već kako ih najbolje iskoristiti u kriznom komuniciranju.

Nesporno je od početka ovog stoljeća, da iz krize u krizu u koje upada svijet ili pojedina njegova područja, ovisnost o webu i upotreba digitalnih mreža, medija i aplikacija raste. (Hadow & Hadow, 2014). To najbolje potvrđuje i posjećenost stranicama 034 portala u vrijeme korona krize koji je prikazan u sljedećoj slici.

Slika 1. Broj sesija 034 portal 1.1.2020-9.10.2020



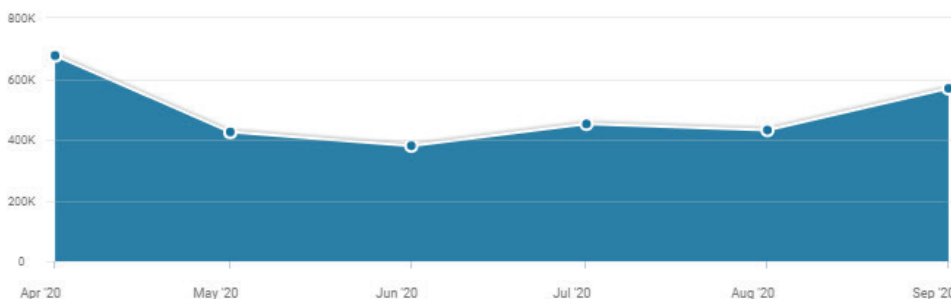
Izvor: (Mandarić, 2020)

Sesija je skup korisničkih interakcija s web-lokacijom koje se odvijaju unutar zadanog vremenskog okvira. Iz prikaza je vidljivo da je najveći broj posjeta stranici 034 portala ostvaren krajem mjeseca ožujka 2020., kada je u Požegi zabilježen prvi oboljeli od korona virusa, naime tada je evidentirana brojka od gotovo 85 tisuća sesija, te krajem mjeseca veljače 2020., kada je zabilježen prvi oboljeli u Hrvatskoj i kada je stranice portala posjetilo oko 75 tisuća posjetitelja. Ostali period bilježi višegodišnji

prosjeak posjeta koji se prema podacima vlasnika portala kreće od 25-45 tisuća sesija dnevno. Promatrano prema broju stanovnika prema podacima iz popisa stanovništva 2011., kada se na ovom prostoru nalazilo oko 78 tisuća stanovnika, proizlazi da je svaki od njih u vrijeme pojave oboljelih u Hrvatskoj i Požegi posjetio portal, te nekoliko tisuća njih izvan županije.

No, kada se uzme u obzir brojka od 50 tisuća stanovnika, na koliko se cijeni danas broj stanovnika samo Požeštine (županija bez Pakraca i Lipika), taj udjel je znatno veći i može se govoriti o značajnoj posjećenosti i važnosti ovog medija za informiranje u krizi. Kriza je utjecala i na ukupnu posjećenost stranicama 034 portala, što pokazuje i sljedeća slika. Naime, broj posjeta u navedenom periodu je najveći u ožujku i travnju kada je evidentirano oko 680.000 posjeta stranicama portala, što je značajno više u odnosu na ostale mjesece, koji su ujedno približno jednaki višegodišnjem prosjeku.

Slika 2. Ukupan broj posjeta stranicama 034 portala 20.4.-20.10.2020



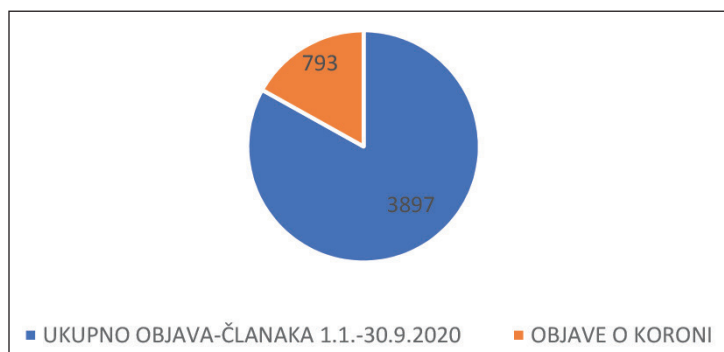
Izvor: (Similarweb, 2020)

034 portal i komunikacija u krizi

U svrhu dobivanja rezultata za potrebe ovog istraživanja korištena je metoda analize sadržaja kojom se najbolje mogu proučiti pojedini sadržaji. Sadržaj je analiziran u periodu od 1. siječnja 2020. do 30. rujna 2020. Za taj period su analizirani podaci objavljeni na odabranom portalu putem dostupne on-line baze i prema unaprijed zadanim kategorijama.

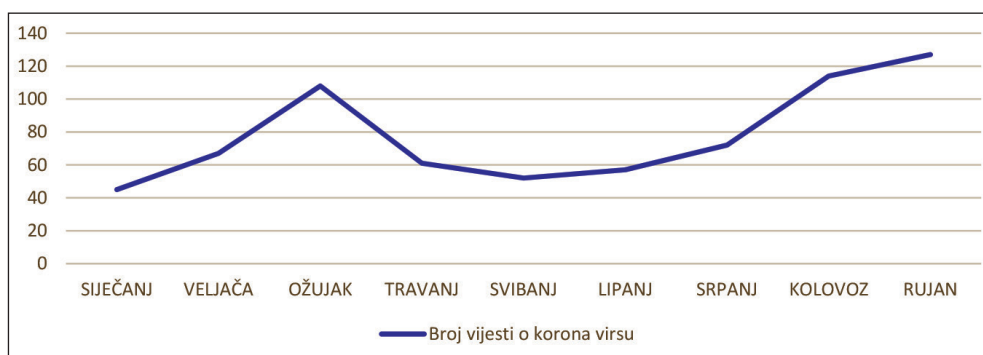
Pojavu epidemije korona virusa i izvješćivanje o navedenoj krizi na 034 portalu, možemo kroz sačinjenu analizu podijeliti u nekoliko perioda koji imaju sljedeća obilježja:

- prosinac 2019.,-kraj mjeseca veljače 2020.,-rijetka, gotovo nezastupljena tematika, o pojavi virusa, poneka vijest o stanju u svijetu;
- kraj mjeseca veljača 2020.,-kraj mjeseca ožujka 2020., -češća zastupljenost, posebice vijestima o oboljelim u RH, prenošenje preporuka Stožera;
- kraj mjeseca ožujka 2020.,-kraj mjeseca travnja 2020.,-prvi oboljeli u Požegi, vijest o krizi je na naslovnici, učestaliji članci, komentari, preporuke.
- travanj-početak kolovoza 2020.,;-izvješća o stanju u RH, dobri pokazatelji za Požegu, prilagođeni sadržaji.
- kraj kolovoza 2020.,: veći broj oboljelih, pojava kritičkih članaka (treba li se održati festival, devetnice vjernika itd.).



Grafikon 1. Ukupan broj objava 034 portal 1.1.-31.8.2020. i objave o korona virusu

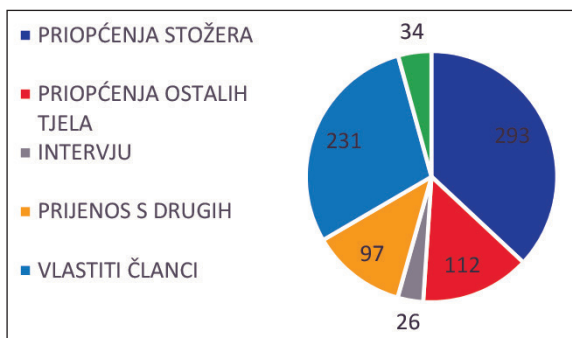
Izvor: (034 Portal, 2020)



Grafikon 2. Objave 034 portala po mjesecima 1.1.-30.9.2020. o korona virusu

Izvor: (034 Portal, 2020)

Analizom odabranog sadržaja u grafikonu II. utvrđeno je kako je učestalost objava medijskog sadržaja na temu korona virusa kroz promatran period varirala. Pretpostavka je da je uzrok toga sadržan u tri perioda, pojave virusa u Svijetu, RH, te veći broj oboljelih u Požeštini.

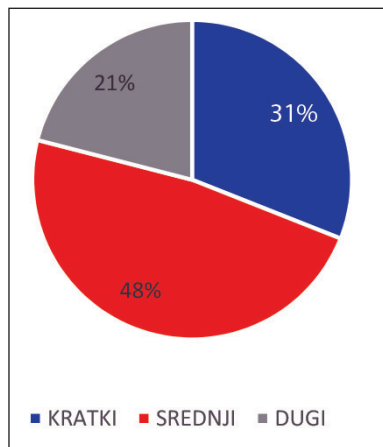


Grafikon 3. Sadržaj objava-članaka o koroni na 034 portalu prema izvoru izrade-saznanja

Izvor: (034 Portal, 2020)

Iz grafikona III vidljivo je da je menadžment najveću pažnju poklonio stručnim tijelima stožerima-nacionalnom i lokalnom, što također potvrđuje činjenicu o određenoj ka stručnom i kvalitetnom informiranju od vjerodostojnog izvora. Vlastiti članci slijede priopćenja stožera, a prijenos vijesti o koroni s drugih medija je na trećem mjestu u ukupnom udjelu vijesti o koroni na 034 portalu.

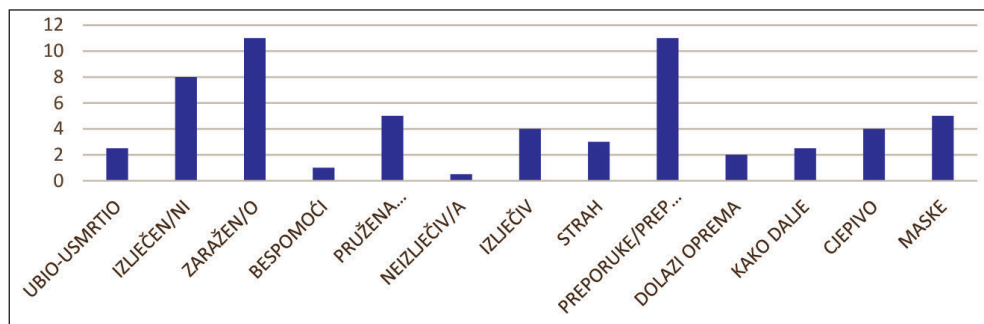
Pri izradi grafikona IV., za potrebe dobivanja pokazatelja o duljini pojedinih članaka, (teksta), isti su podijeljeni u tri grupe i to kratki do 1500 riječi, srednji od 1501 do 4000 riječi i dugi kojim su se smatrali svi oni iznad 4000 riječi.



Grafikon 4. Duljina članka o koroni na 034 portalu

Izvor: (034 Portal, 2020)

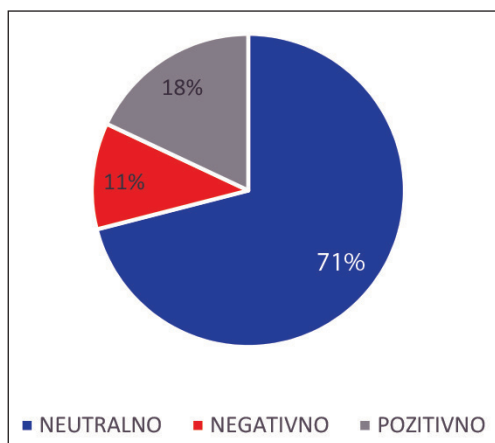
Prije izrade grafikona V., i analize članaka u njemu, pristupilo se definiranju skupova riječi koje karakteriziraju izvješćivanje u krizi, odnosno pandemiji, odnosno onih koje potiču osjećaj straha, nesigurnosti, nelagode prilikom čitanja, te dio njih koji su se odnosili na prevenciju i samo zaštitno ponašanje. Skupovi riječi koji su odabrani prenijeti su i prikazani u grafikonu:



Grafikon 5. Korištene riječi na 100 riječi članka o koroni

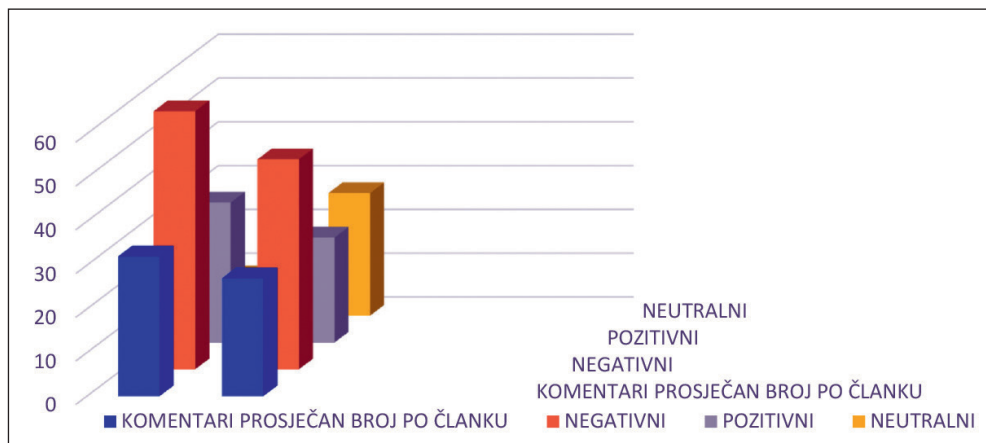
Izvor: (034 Portal, 2020)

Bitna činjenica vezana za medije i komuniciranje u kriznim situacijama, odnosi se na to kakvo gledište, (stav/stajalište), medij zauzima u pogledu krize, odnosno pandemije, te time isto prenosi korisnicima, koji po njemu zauzimaju svoj stav o krizi. Za iskazivanje tog pokazatelja, bilo je potrebno podatke prije izrade grafikona strukturirati, odnosno gledišta odrediti kao negativno, neutralno i pozitivno gledište o krizi, odnosno pandemiji. Iz dobivenih pokazatelja se uočava da 11% članaka bilježi pozitivno gledište o pandemiji, 18% neutralno i 71% negativno gledište.



Grafikon 6. Procijeneno stajalište 034 Portala o krizi

Izvor: (034 Portal, 2020)



Grafikon 7. Komentari općenito na objavljene članke i članke o koroni

Izvor: (034 Portal, 2020)

Kada se gleda povezanost gledišta pojedinih članaka i broja komentara na članke, uočava se da članci koji su procijenjeni negativnim imaju najveći broj komentara, dok oni pozitivno označeni imaju značajno manji broj komentara. To je slučaj i kod

svih članaka općenito, kao i kod članaka koji su se odnosili na pandemiju. Tako možemo istaći da za vrijeme nastupa epidemije kao krizne situacije, 034 Portal nije bio prepun sadržaja vezanog uz krizu, pogotovo zbog povoljnog stanja u Požeštini do kraja kolovoza 2020., i nije doveo do medijalizacije epidemijskog događaja koji je veoma složen. Već je menadžment portala uspio dobro komunicirati „novo normalno vrijeme“ kako ga je stožer nazvao, odnosno pratiti unatoč manjem broju oboljelih i krizu vezano za koronu, ali i ostale redovne (djelom smanjenje) sadržaje i time ne uzrokovati i utjecati na poticanja straha kod građana. (Rezultati nekoliko istraživanja provedenih o utjecaju medija na javnost za vrijeme epidemija, ukazuju na to da je medijska popraćenost epidemije važan faktor, te utječe na razinu zabrinutosti i širenja straha među populacijom). (Rašić, 2020)

ZAKLJUČAK

Informacija njenom posjedniku daje moć, a negativno prikazana, posebice u javnosti putem medija u vrijeme kriza kao što je korona kriza može uzrokovati strah, tjeskobu, nesigurnost i zabrinutost te potencijalno stupanj krize, odnosno njene posljedice podići na viši – nepotreban nivo. U doba digitalizacije i informatizacije, u kojem danas živimo najučestaliji način širenja informacija odvija se putem web-a, odnosno Interneta, kao i u slučaju 034-portala. Mediji u lokalnoj zajednici, malim sredinama, posebice vodeći kao 034 Portal, predstavljaju jedan od glavnih izvora informacija građanima, jer su vrlo dostupni, a pri kreiranju sadržaja vijesti i odabirom načina kako ih prezentirati široj javnosti u značajnoj mjeri mogu utjecati na kreiranje vlastitog stava kod građana o pojedinoj pojavi ili temi i mogu krizu i krizno upravljanje usmjeravati u željenom ili neželjenom – negativnom pravcu. To mogu činiti na više načina, ali i nesvjesno koristeći neprovjerene izvore i time oblikovanje stavove građanstva. Uslijed kreiranja i širenja izrazito negativnih i neprovjerenih informacija mediji direktno utječu na građane te potencijalno mogu stvoriti dodatne probleme u krizi. (Dobar primjer je prosvjed protiv mjera Stožera koji je dio medija prenio i dao mu značajan medijski prostor). Model na kojem se u vrijeme pandemije u Hrvatskoj stožeri i mediji vladaju u krizi neminovno nalaže strateško krizno komuniciranje prema građanima, koje treba što više nastojati usuglasiti između medija i stožera, kako bi se postiglo što učinkovitije informiranje, jer nisu rijetki slučajevi da se pojedina tema ili izvanredan događaj i pojava prikažu u drukčijem svjetlu, nego kakva su mu stvarna obilježja. U slučaju istraživog web portala, može se zaključiti kako se 034 portal i njegov menadžment unatoč brojnim neistinitim i kontradiktornim informacija u okruženju i na državnoj razini i u situaciji u kojoj je javnost bila zbunjena i zabrinuta uspio nositi sa senzacionalizmom i pravovremeno, kvalitetno i bez senzacionalizma izvještavao javnost o pandemiji. Može se reći, (za razliku od drugih prostora), da je na području djelovanja 034 portala njegovim radom stvoreno okruženje u kojem javnost dobro razlučuje kojem izvoru podataka vjerovati, a kojem ne, što potvrđuje posjećenost portalu, te brojni komentari građana. Zasižno je da korona kriza i njeni negativni efekti u pogledu dezinformiranja u slučaju 034 portala nisu uzrokovali eksponencijalno brzo širenje dezinformacija i stvaranje nesigurnog okruženja. Ono na što bi svakako trebalo ukazati menadžmentu je ipak činjenica da je zabilježen manji broj objava vezan za aktivnosti Svjetske zdravstvene organizacije u korona krizi, a kako će kriza očito imati nastavak menadžmentu će zasižno trebati poseći i za primjerom dobro promišljenog kriznog komuniciranja

koji je vidljiv u Svjetskoj zdravstvenoj organizaciji koja širenje neistinitih informacija pokušava izbjeći uz pomoć suradnje sa Google-om te društvenim mrežama na kojima zajednički ograničavaju neistinite vijesti o krizi.

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LOCAL MEDIA IN THE CORONA CRISIS: SIGNIFICANCE AND CHALLENGES ON THE EXAMPLE OF POŽEGA 034 PORTAL

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Summary: *The epidemic of the disease COVID-19, in Požeština in relation to China, where it originated in other parts of Croatia, appeared somewhat later, while Pože-ga-Slavonia County in terms of total share in relation to other counties in Croatia remained relatively well, 16th place, out of a total of 20 counties, ie a smaller number of patients was recorded. In the conditions of public health danger to the health and lives of people with expressed uncertainty, citizens around the world were flooded with numerous information, about the disease, ways of prevention, treatment that at one point threatened to turn into an infodemia, as warned by the WHO. The importance of crisis communication in such conditions is of great importance, and how governments and headquarters communicate messages about the crisis to the public, which is discussed in the first parts of the paper and points out several inconsistencies and illogicalities in the actions of the state headquarters. prohibition and permission to make recommendations contrary to the epidemiologist's recommendations. But more important than the recommendations of headquarters and governments, today are the recommendations and news transmitted by digital media, and especially the local ones that bring news and recommendations for the area where we live. Therefore, the aim of this paper was to investigate in the central part the significance of the local 034 Portal in the Corona crisis, and its monitoring of the crisis and its impact on the public. Research through several segments, it was found that the portal maintained the level of reporting on regular events and adjusted reporting on the Crown to the conditions and situation in the county, not leading to sensationalism, concern, fear, but was a carrier of preventive activities and a good ally in the fight. against the epidemic, that is, he followed the guidelines for informing the WHO and did not contribute to the creation of an infodemia.*

Key words: media; crisis communication; crisis; disease.

The JEL Classification: H12.



ANALIZA LIKVIDNOSTI I SOLVENTNOSTI REALNOG SEKTORA PRIVREDE SRBIJE 2018-2019

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Sažetak: *Pitanja likvidnosti i solventnosti kompanija, a ne samo pitanja profitabilnosti, od krucijalne su važnosti u kontekstu razmatranja budućeg poslovanja kompanija, a samim tim i privrednih sektora i privrede u celini. Već nekoliko godina unazad, potrebna kratkoročna sredstva i dalje nisu dovoljna za servisiranje tekućih obaveza. Stope likvidnosti su na polovini od zadovoljavajućeg nivoa, dok rast dugoročnih kredita, zajedno sa sopstvenim kapitalom, još uvek nije dovoljan za finansiranje stalne imovine (solventnost). Pitanja likvidnosti i solventnosti utiču kako na efikasnost tj produktivnost kompanije, tako i posredno na profitabilnost. U radu se na bazi raspoloživih informacija razmatraju rezultati realnog sektora privrede Srbije za period 2018-2019, u kontekstu likvidnosti i solventnosti, kao i odabranih pojedinih sektora, a pomoću opšteprihvaćenih indikatora. U novonastaloj situaciji izazvanom virusom COVID 19, kompanije su se našle u poziciji, da mnoge imaju potrebu za dodatnim kapitalom, kako bi poboljšale i uskladile finansijsku strukturu. Rezultat analize upućuje na zaključke da u pogledu prihoda i rentabilnosti realnog sektora neće doći do značajnih promena u kratkom roku, ali da će kriza uslovljena koronavirusom najviše pogoditi mala, mikro i srednja preduzeća kada su u pitanju likvidnost i solventnost, a koja već imaju narušenu ravnotežu u tom pogledu. U dugom roku, narušena solventnost, a potom i likvidnost uticaće i na još uvek dobru profitabilnost sektora. U tom osvrtnu, pitanja solventnosti imaju značajniji uticaj, jer će dugoročno gledano, ako se ne preduzmu korektivne mere, usloviti nemogućnost plaćanja dugoročnih dospelih obaveza, te uticati na povećanje kompanija koje posluju bez kapitala i povećati broj privrednih društava u blokadi. Sektori koji će imati najveće probleme i u pogledu likvidnosti i u pogledu solventnosti su sasvim sigurno saobraćaj, smeštaj i ishrana, umetnost, zabava i rekreacija, a vrlo verovatno i građevinarstvo.*

Ključne reči: likvidnost; solventnost; sektorska analiza; privredna kretanja.

JEL klasifikacija: E37

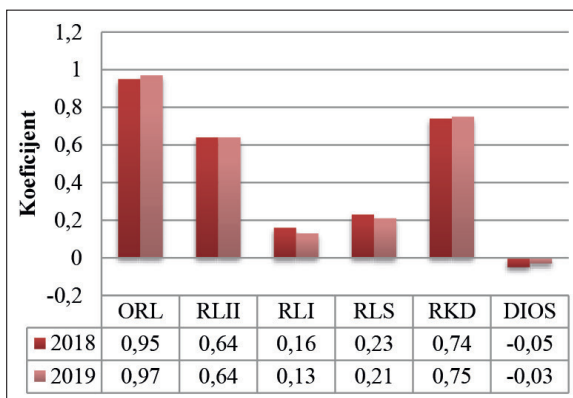
UVOD

Mnoge države, pa tako i Srbija, su se u prethodnih nekoliko godina oporavljale od posledica finansijske krize, a 2014. godina smatra se i godinom kada smo se suočavali i sa posledicama poplava. U poslednjih šest godina započet je period postepenog rasta privrede Srbije, rast BDP-a, kao i uvećanje obima poslovnih aktivnosti. Kada se posmatra celokupna privreda ili pojedinačna privredna društva, najčešći primarni pokazatelji koji mere uspešnost i koji se uzimaju u obzir su pokazatelji profitabilnosti tj rentabilnosti, kao i pokazatelji o akcijama, ako je društvo akcionarsko, tj pokazatelji tržišne vrednosti kompanije. Razlog za to jesu prvenstveno interesi investitora, vlasnika, akcionara, koji donose odluke da li uložiti sredstva u kompaniju ili ne. Iz tog razloga su i kompanije zainteresovane da im pokazatelji iz ove sfere budu na nivou pokazatelja koje pokazuje privreda u celini ili grana kojoj kompanija pripada. Međutim, u periodu oporavka privrede, kao i u novonastaloj situaciji izazvanom virusom COVID 19, kompanije su se našle u poziciji, da mnoge imaju potrebu za dodatnim kapitalom, kako bi poboljšale i uskladile finansijsku strukturu. Mnoge to rade ili pribavljanjem novih kredita od kreditora kao što su banke, ili restrukturiranjem postojećih ili konvertovanjem kratkoročnih u dugoročne kredite, kako bi imali više vremena za otplatu, ili pak povećavanjem obaveza iz poslovanja, dakle dugovanja dobavljačima zarad otplate kredita i ostalih obaveza. Upravo su zato i pitanja likvidnosti i solventnosti kompanija, a ne samo pitanja profitabilnosti, od krucijalne važnosti u kontekstu razmatranja budućeg poslovanja kompanija, a samim tim i privrednih sektora i privrede u celini. Dok su investitori oni koji su zainteresovani za pokazatelje profitabilnosti, kreditori su ti koji su zainteresovani za pokazatelje likvidnosti i solventnosti. Likvidnost predstavlja sposobnost preduzeća da plaća dospele obaveze i to one kratkoročne obaveze, tj one koje dospevaju u periodu do godinu dana, dok je solventnost sposobnost preduzeća da plaća dospele dugoročne obaveze, tj one koje dospevaju za više od jedne godine. U pogledu profitabilnosti mnoge privredne grane su znatno poboljšale svoje performanse u zadnjih šest godina, čak je i stopa izgubljenog kapitala (gubitak iznad visine kapitala) opala sa 43,7 odsto 2014.god na 36,5 odsto 2019.god. Gubitak iznad kapitala u vrednosti od 11,9 mlrd. EUR iskazalo je 25.267 preduzeća u 2019. god, odnosno čak 24,2% preduzeća poslovalo je bez kapitala. (Agencija za privredne registre, 2020) Međutim, to je i dalje ogroman procenat, jer upućuje da čak 24,2 odsto kompanija posluje bez kapitala i da su izgubili i veliki deo tuđeg (pozajmljenog) kapitala. Uz pomenuto, potrebna kratkoročna sredstva i dalje nisu dovoljna za servisiranje tekućih obaveza. Stope likvidnosti su na polovini od zadovoljavajućeg nivoa, dok rast dugoročnih kredita, zajedno sa sopstvenim kapitalom, još uvek nije dovoljan za finansiranje stalne imovine (solventnost). Pitanja likvidnosti i solventnosti utičaće na efikasnost tj produktivnost kompanije, jer od sposobnosti kompanije da servisira obaveze, utiče i njegoja sposobnost da efikasno upravlja svojom imovinom. Posledično, pitanja efikasnosti utiču na profitabilnost, jer prihodi i rashodi i njihova razlika (dobitak ili gubitak) proističu iz angažovanja sredstava i izvora finansiranja (aktive i pasive) neke kompanije. (Knežević, 2008) Ako su sredstva i izvori efikasno korišćeni, firma ostvaruje dobitak, u protivnom ostvaruje gubitak. (Knežević, 2008) Iz toga sledi da likvidnosti i solventnost utiču ne samo na efikasnost, nego i posredno na rentabilnost kompanije. Iz tog razloga, ovaj rad pozabaviće se pitanjima likvidnosti i solventnosti realnog sektora privrede Srbije u periodu 2018. i 2019. godine, kao i pojedinih izabranih privrednih sektora.

U radu se analiziraju performanse isključivo realnog sektora privrede. Informacije će se prevashodno bazirati na dostupnim podacima sa sajta Agencije za privredne registre, koji svake godine objavljuje makroekonomske podatke za privredu i sve privredne sektore. Polovinom ove 2021.godine sa nestrpljenjem očekujemo i finansijske izveštaje za 2020. godinu, gde ćemo moći sagledati realne efekte uticaja koronavirusa, koji je zadao ogromne probleme kompanijama, a posebno onima iz sektora ugostiteljstva, umetnosti, turizma, avio saobraćaja itd.

Prema izveštaju o tekućim makroekonomskim kretanjima koji je Ministarstvo finansija objavilo u septembru prošle godine, (Ministarstvo finansija RS, 2020) usluge će najnegativnije uticati na ukupne privredne aktivnosti u 2020. godini, pre svega zbog gubitaka u turizmu, transportu, ali i u delatnostima kao što su zabava i rekreacija. (Žarković, 2020) Upravo privredna zvezda iz 2019.god, sektor usluga, koji je predvodio privredni rast, prošle godine se preobratio u najveću žrtvu pandemije korona virusa. Za godinu dana u blokadu je ušlo više od 6.000 preduzeća. Na osnovu podataka Narodne banke Srbije, trenutno su blokirana 39.083 pravna lica. (Narodna banka Republike Srbije, 2021) Poslednjeg dana u januaru ove godine njihovi računi bili su blokirani za ukupno 294,7 milijardi dinara, bez kamate. Iznos prosečne blokade po preduzeću sada je manji, što govori da su firme sada u većim teškoćama i da su im i likvidnost i solventnost niži nego u 2018. god. U privredi uvek postoji međusobna povezanost i uslovljenost poslovanja između kupaca i dobavljača, a činjenica da je mnogo veći broj kompanija u blokadi govori i u prilog stavu da je veliki broj blokiranih kompanija, blokiranih od strane njegovih poslovnih partnera, kao oblika odbrane od sopstvene nelikvidnosti.

ANALIZA LIKVIDNOSTI REALNOG SEKTORA PRIVREDE SRBIJE 2018-19. GOD



Grafikon 1. Dinamika likvidnosti realnog sektora privrede Srbije, 2018 – 2019. god

Izvor: Proračun autora na bazi podataka APR

Ukoliko likvidnost privrede ocenjujemo na bazi kretanja opšteg racija likvidnosti¹ (ORL) možemo da zaključimo da se kratkoročna finansijska sigurnost privrede u posmatranom periodu blago poboljšala. (Živanović, 2018) Međutim, ona se i dalje

¹ Opšti racio likvidnosti predstavlja odnos između obrtne imovine i kratkoročnih obaveza i pokazuje sa koliko dinara obrtne imovine je pokriven svaki dinar kratkoročnih obaveza.

nalazi na relativno niskom nivou, budući da je vrednost pomenutog pokazatelja u svim posmatranim godinama iznosila manje od 1. To znači, da preduzeća u proseku nisu bila u stanju da obrtnom imovinom pokriju svoje kratkoročne obaveze. (Živanović, 2018) Budući da zalihe predstavljaju najnelikvidniji oblik obrtne imovine, jer im za konverziju u gotovinu treba najviše vremena, to se čini uputnim u analizu uključiti Racio likvidnosti II stepena² (RLII), koji isključuje zalihe i Racio likvidnosti I stepena ili Rigorozni racio likvidnosti³ (RLI), koji za odnos sa kratkoročnim obavezama ostavlja samo gotovinu. Oba ova pokazatelja su znatno ispod norme 1, a posebno Rigorozni racio likvidnosti, koji je iz 2018. u 2019. god, imao i pad. Pomenuto ukazuje da dolazi do pada učešća gotovine u aktivni kompanija. Iako veoma zastupljen u literaturi, Rigorozni racio likvidnosti ipak prikazuje stanje gotovine na dan bilansa, što može biti veoma diskutabilno, odnosno ne mora prikazivati stvarni cash flow kompanije, nego prikazuje samo presek na dan bilansa. S druge strane, gotovina može biti namenjena isplati rashoda, pa sa ovim pokazateljem treba biti veoma oprezan. Pokazatelj koji mnogo više ima smisla za analizu je Racio likvidnih sredstava (RLS)⁴, koji i dalje uzima u analizu samo najlikvidnije oblike imovine i koji je takođe u padu te i znatno ispod norme 1. Pokazatelj, koji prikazuje odnos između brzine naplate potraživanja i brzine isplate obaveza je Racio salda kupaca prema saldu dobavljača⁵ (RKD), te koji prikazuje da ne postoji izjednačenost ove dve dinamike, tj da naplata potraživanja u obe posmatrane godine ide dosta sporije u odnosu na isplatu obaveza. Neznatno je došlo do poboljšanja brzine naplate u poslednjoj godini posmatranja. Neto obrtna sredstva⁶ su u obe posmatrane godine negativna, iako je došlo do blagog poboljšanja u poslednjoj godini, a budući da ona pokazuju dugoročne izvore finansiranja obrtnih sredstava, ali i determinišu sposobnost zaduživanja na kratak rok, dolazimo do zaključka da privreda Srbije u realnom sektoru ima i dalje veliki problem nelikvidnosti, uprkos blagim poboljšanjima. Dakle, u svakom od aspekata dolazimo do zaključka da obrtna imovina ne pokriva kratkoročne obaveze. Racio opšte likvidnosti, koji jeste na graničnom nivou, je stoga posledica povećanja učešća zaliha u strukturi obrtne imovine, a ne monetarne aktive. Iz tog razloga možemo zaključiti da i ova tek granična likvidnost na koji ukazuje ovaj pokazatelj je diskutabilna.

Ukoliko u budućnosti ne dođe do značajnijeg povećanja efikasnosti u pogledu upravljanja zalihama (većeg obrta zaliha) i upravljanja potraživanjima (veći stepen naplate potraživanja uz skraćivanje perioda naplate) ne može se očekivati značajnije poboljšanje pozicije likvidnosti privrede (Živanović, 2018). Pored toga neophodno je nastaviti sa pravcem u kojem bi se skratio period isplate obaveza prema dobavljačima,

² Racio likvidnosti II stepena računa se (Obrtna imovina-Zalihe)/Kratkoročne obaveze i pokazuje pokriće kratkoročnih obaveza likvidnim sredstvima i potraživanjima

³ Rigorozni racio likvidnosti računa se Gotovina/Kratkoročne obaveze i pokazatelj je pokrića kratkoročnih obaveza sa gotovinom i gotovinskim ekvivalentima

⁴ RLS računa se (Kratkoročni finansijski plasmani + Gotovina)/Kratkoročne obaveze i pokazuje pokriće kratkoročnih obaveza sa gotovinom i kratkoročnim finansijskim plasmanima

⁵ RKD računa se Prosečna potraživanja/Prosečne obaveze prema dobavljačima i prikazuje izjednačenost naplate potraživanja i isplate obaveza

⁶ Neto obrtna sredstva dobijaju se tako što se od Obrtne imovine oduzmu Kratkoročne obaveze

budući da je primetan kontinuirani rast obaveza prema dobavljačima, koji može upućivati na zaključak da kompanije, odlažući plaćanje obaveza dobavljačima, zarad isplate drugih obaveza ili manjka likvidnih sredstava uopšte, pokušavaju da se kreditiraju na taj način, umesto uzimanja kredita od kreditora. Umesto toga, povećavaju ne samo svoju nelikvidnost, nego i čitavog lanca poslovnih partnera, što na koncu dovodi i do sve većih blokada računa kompanija u privredi. Uz prethodno pomenuto, ne smemo zaboraviti da svi ovi podaci dolaze iz perioda kada još nije bilo krize izazvane pandemijom koronavirusa. Analiza oštrijeg pokazatelja likvidnosti (RLI) pokazuje da se, iako je likvidnost privrede ostala faktički nepromenjena od 2016. god, struktura novčanih obrtnih sredstava (kada smo isključili zalihe) se promenila, zbog pada učešća kratkoročnih finansijskih plasmana, nauštrb rasta učešća gotovine i gotovinskih ekvivalenata. Razlozi u promeni strukture novčanih obrtnih sredstava leže u trendu smanjenja učešća rashoda za kamate u obrtnim sredstvima: sa 2,42% u 2015. god; 1,8% u 2016. god; 26,85% u 2017. god; 1,29% u 2018. god i 1,6% u 2019. godini. Treba napomenuti da je 40% kamata kontinuirano koncentrisano u velikim preduzećima. (Republički zavod za statistiku, 2020) Generalno, nelikvidnost privrede je hroničan problem, strukturnog je karaktera, predstavlja rezultat neefikasnosti poslovanja i visokog stepena volatilnosti na uticaj egzogenih varijabli.

ANALIZA SOLVENTNOSTI REALNOG SEKTORA PRIVREDE SRBIJE 2018-19 GOD

Prema izveštaju, odnosno proceni MMF-a (International Monetary Fund, 2020), postoji mogućnost da, usled krize izazvane pandemijom koronavirusa, procenat nesolventnih kompanija poraste između 11 i 20 odsto, kada su u pitanju razvijene zemlje, odnosno čak između 14 i 30 odsto kada su u pitanju zemlje u razvoju. Iako bi najavljene politike mogle da pomognu firmama da se suoče sa nedostatkom likvidnosti, kao i rezultirajućim povećanjem zaduženosti i dalje postoji zabrinutost zbog rizika solventnosti i perspektive ulaganja u budućnosti. Simulacije solventnosti za Evropu u nastupajućem periodu, a na osnovu projekcije MMF-a, sugerišu da bi koeficijenti leverage-a u korporativnom sektoru mogli znatno da porastu, posebno u naprednim ekonomijama kao i za preduzeća sa već visokim koeficijentima leverage-a. Nakon što sve državne mere budu sprovedene, MMF procenjuje da će udeo likvidnih, ali nesolventnih kompanija značajno porasti i to posebno u naprednim ekonomijama upravo zbog finansijskih troškova povezanih sa novouzetim kreditima, kao merama pomoći (International Monetary Fund, 2020).

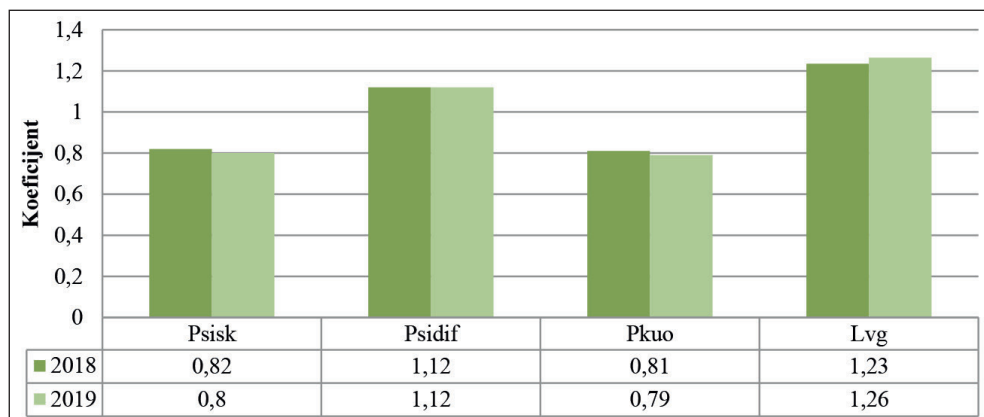
Pokazatelji solventnosti kojima ćemo se koristiti su: Pokazatelj pokrića stalne imovine sopstvenim kapitalom (Psisk)⁷ ili Capitalisation ratio, Pokazatelj pokrića stalne imovine dugoročnim izvorima finansiranja (Psidif)⁸, koeficijent leverage-a (LVG)⁹,

⁷ Psisk obračunava se deljenjem sopstvenog kapitala sa stalnom imovinom i pokazuje sa koliko dinara sopstvenog kapitala je pokriven svaki dinar stalne imovine.

⁸ Psidif se obračunava deljenjem kapitala i dugoročnih obaveza sa stalnom imovinom i pokazuje sa koliko dinara dugoročnih izvora je pokriven svaki dinar stalne imovine.

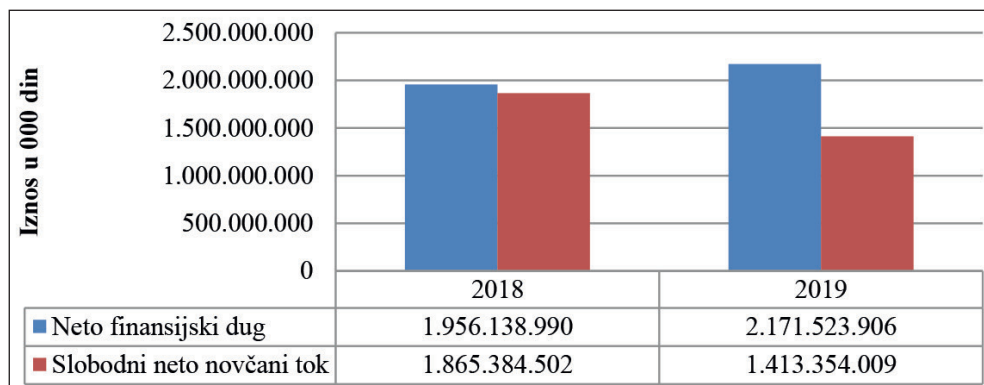
⁹ Leverage se obračunava kao odnos između ukupnih dugovanja i kapitala i pooku njega se pokušavaju izmeriti efekti finansiranja iz pozajmljenih izvora na rentabilnost.

Pokazatelj pokrića kapitala prema ukupnim obavezama (Pkuo)¹⁰, Neto finansijski dug (NFD)¹¹ i Slobodni neto novčani tok ili Free cash flow (FCF).¹²



Grafikon 2. Dinamika solventnosti realnog sektora privrede Srbije, 2018 – 2019. god

Izvor: Proračun autora na bazi podataka APR



Grafikon 3. Neto finansijski dug i Slobodni neto novčani tok realnog sektora privrede Srbije, 2018 – 2019. god

Izvor: Proračun autora na bazi podataka APR

Pokazatelj pokrića stalne imovine dugoročnim izvorima finansiranja je 1,12 i nepromenjen je u posmatranom periodu. Pokazatelj sugerise da se stalna imovina u potpunosti finansira iz dugoročnih izvora i to posle dugog perioda (2013. god-2017. god) finansiranja iz kratkoročnih izvora, (Živanović, 2018) što je svakako pozitivan trend. Međutim, ukoliko posmatramo poluge rasta dugoročnih izvora finansiranja vidimo da

¹⁰ Pkuo se obračunava kao odnos kapitala i ukupnih obaveza (dugoročnih i kratkoročnih) i govori o strukturi pasive.

¹¹ NFD pokazuje zaduženost preduzeća po osnovu finansijskih obaveza umanjjenih za finansijske plasmane i za raspoloživa novčana sredstva.

¹² FCF pokazuje iznos novčanih sredstava koji preduzeću ostaje nakon isplate svih troškova uključujući i investicije. Dobija se iz jednakosti $FCF = EBIT - POREZI IZ DOBITI + AMORTIZACIJA - \Delta OBRTNE IMOVINE - \Delta STALNE IMOVINE$.

one pre svega leže u porastu dugoročnih obaveza, budući da se njihovo učešće u dugoročnim izvorima finansiranja povećalo sa 26,76% u 2018. god na 28,22% u 2019. godini, odnosno da finansiranje sopstvene imovine leži u sve većoj zaduženosti, a ne u rastu sopstvenog kapitala. Upravo nam to potvrđuje i pokazatelj pokrića sopstvene imovine sopstvenim kapitalom, koji je ne samo ispod 1, nego je i u padu. Takođe, treba imati u vidu da je prema podacima Agencije za privredne registre (APR) došlo do pada broja privrednih društava u 2019. godini za 1.368 jedinica nego u 2018. godini na šta ukazuje i značajno manji iznos osnovnog kapitala u 2019. u odnosu na 2018. godinu. (Agencija za privredne registre, 2020) Samim tim, na izvor povećanja sopstvenog kapitala i solventnosti privrede može se računati samo putem povećanja neraspoređenog dobitka čija stopa rasta treba premašivati stopu pada osnovnog kapitala, usled smanjenja broja privrednih subjekata. Ukoliko posmatramo strukturu stalne imovine, zaključujemo da se nastavlja trend prenet iz prethodnih godina, po kome stopa rasta udela nekretnina, postrojenja i opreme raste značajno više nego što je to slučaj sa stopom rasta dugoročnih finansijskih sredstava. Pomenuto upućuje da su investicije preduzeća delimično preusmerene iz finansijske u realnu imovinu. Potencijalne razloge treba tražiti u višim stopama prinosa koje preduzeća mogu očekivati od ovakvog tipa ulaganja. (Živanović, 2018) Nerazvijenost domaćeg finansijskog tržišta, koje preduzećima nudi vrlo skromne mogućnosti za ulaganje u finansijsku aktivu, uz konstantan pad kamatnih stopa, očigledno je doveo do smanjenog plasiranja slobodnih novčanih tokova u finansijsku aktivu (Živanović, 2018). Stoga, na stopu pokrića finansiranja stalne imovine iz dugoročnih izvora i solventnosti realnog sektora ne može se računati trajno. Kada je u pitanju sam slobodan novčani tok i koji pokazuje iznos novčanih sredstava koji preduzeću ostaje nakon isplate svih troškova uključujući i investicije, došlo je do njegovog značajnog smanjenja za 24,23%, a najviše kao posledica sve veće zaduženosti, čemu u prilog govori povećanje pokazatelja neto finansijskog duga. Neto finansijski dug pokazuje zaduženost preduzeća po osnovu finansijskih obaveza (kao što su npr obaveze po osnovu kredita) umanjene za finansijske plasmane i za raspoloživa novčana sredstva. (Slović, 2010) Ovo je jedan od najznačajnijih pokazatelja za potencijalne investitore. Neto finansijski dug se povećao za 11,01%. Sumirani učinak negativno će uticati na solventnost odnosno dugoročnu likvidnost realnog sektora Srbije, ukoliko se ovakav trend nastavi.

Još jedan značajan pokazatelj solventnosti je Koeficijent leverage-a, ili popularno poznat kao pokazatelj zaduženosti, koji je takođe, a očekivano, porastao iz 2018. god u 2019. god., sa 1,23 na 1,26, odnosno u posmatranom periodu je zaduženost privrede rasla. Ukoliko na ovu već narušenu strukturu solventnosti privrede tj realnog sektora, dodamo predviđanja MMF, gde će udeo nesolventnih kompanija zemalja u razvoju porasti u 2020. god za između 14% i 30%, a usled pandemije, možemo biti sve samo ne optimistični. (Finalne procene još se očekuju) Jedan od problema privrede je trend rasta ukupnih obaveza i visina zaduženosti. Kumulirani gubici privrede su visoki – u 2019.god iznosili su skoro 30 mlrd. evra (Jakopin, 2020). U strukturi kumuliranih gubitaka, 48,6% je locirano u mikropreduzećima, 10% u malim, 11,9% u srednjim i 29,4% u velikim preduzećima, a podsetićemo stopa izgubljenog kapitala u privredi je i dalje izraženo visoka (36,6%). (Republički zavod za statistiku, 2020) Problem je u poslovanju mikro preduzeća, koja su jedino, od svih grupa preduzeća, povećala stopu izgubljenog kapitala. Upravo mala i mikro preduzeća će biti najviše na udaru problema likvidnosti i solventnosti u nastupajućem periodu. Visina spoljnog duga sužava

manevarski prostor za poboljšanje performansi privrede, rast investicija i povećanje životnog standarda. (Jakopin, 2020) Spoljni dug Srbije u periodu 2015–2019.god je povećan za 2,18 mlrd. evra, dug privrede za 2,44 mlrd. evra. (Republički zavod za statistiku, 2021) U strukturi veličine preduzeća, velika preduzeća su najsolventnija, dok je sektor malih, mikro i srednjih preduzeća konstantno ispodprosečno solventan, isključivo zbog niske solventnosti mikro preduzeća. Pomoći države privredi zbog krize izazvane koronavirusom, ogledale su se u ciljanim paketima pomoći privredi i zdravstvu, institucionalno-strukturnim reformama, sprovođenju prioritarnih reformi u javnom sektoru privrede, sistemskim merama za poboljšanje poslovanja privrede, unapređenju poslovnog ambijenta u cilju rasterećenja preduzetnika od administrativnog i finansijskog opterećenja itd. Ipak, treba naglasiti da su prognoze privrednog rasta za zemlje regiona u 2021. godini optimistične, a za Srbiju se predviđa rast od 6,1%.

ANALIZA LIKVIDNOSTI I SOLVENTNOSTI ODABRANIH SEKTORA PRIVREDE SRBIJE 2018-19. GOD

U drugoj celini ovoga rada, fokus je stavljen na analizu finansijskih performansi po delatnostima. Analizom su obuhvaćene dve poslednje godine, 2018. i 2019.god, pri čemu su u obzir uzete samo one delatnosti koje imaju značajniji uticaj na ukupna privredna kretanja, kao i one koje mogu pretrpeti najveći udar na likvidnost i solventnost u narednim godinama, a zbog posledica koronavirusa.

Tabela 1. Izabrani pokazatelji likvidnosti za pojedinačne sektore, 2018 – 2019. god

Poka- zatelj	Realni sektor-celina		Poljoprivreda		Rudarstvo		Prerađivačka ind.		El. Energija	
Likvid- nost	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
ORL	0,97	0,95	1,05	1,00	1,46	1,26	1,04	0,98	0,82	0,60
RLII	0,64	0,64	0,61	0,58	0,75	0,74	0,63	0,59	0,62	0,48
RLIII	0,13	0,16	0,08	0,07	0,19	0,24	0,12	0,11	0,11	0,10
RLS	0,21	0,23	0,17	0,16	0,26	0,31	0,17	0,16	0,13	0,11
RSKSD	0,75	0,74	0,70	0,71	0,70	0,62	0,77	0,90	0,80	0,62
NOS	-166.447.163	-322.625.697	11.771.363	483.866	53.947.241	32.311.598	61.836.720	-40.141.583	-63.824.379	-191.979.126

Poka- zatelj	Građevinarstvo		Trgovina		Saobraćaj		Smeštaj i ishrana		Umetnost, zabava i rekreacija	
Likvid- nost										
ORL	0,94	0,84	1,11	1,08	0,75	0,96	0,62	0,57	0,51	0,45
RLII	0,60	0,52	0,68	0,66	0,66	0,82	0,47	0,44	0,44	0,38
RLIII	0,12	0,11	0,14	0,13	0,17	0,34	0,13	0,11	0,20	0,15
RLS	0,20	0,19	0,19	0,18	0,25	0,43	0,25	0,23	0,32	0,26
RSKSD	0,69	0,58	0,70	1,02	0,77	0,70	0,32	0,22	0,31	0,22
NOS	-59.374.688	-127.228.103	172.349.843	128.056.957	-83.281.044	-12.822.771	-34.313.321	-36.208.111	-13.144.379	-15.785.402

Izvor: Proračun autora na bazi podataka APR

Sektorska analiza likvidnosti pokazuje da su najlikvidniji sektori: Rudarstvo (opšti ratio likvidnosti je 1,46 i reducirani ratio je 0,75), Prerađivačka industrija (1,04 i 0,63) i Trgovina (1,11 i 0,68), dok su najnelikvidniji sektori privrede Saobraćaj (0,75 i 0,66), Električna energija (0,82 i 0,62), Građevinarstvo (0,94 i 0,60), Smeštaj i ishrana (0,62 i 0,47) i Umetnost, zabava i rekreacija (0,51 i 0,44). (Agencija za privredne registre, 2020) Strogim tumačenjem pojma likvidnosti, nelikvidnim sektorima smatrali bi se sektori Električne energije, Građevinarstva, Saobraćaja, Smeštaja i ishrane i Umetnost zabava i rekreacija. Svi pomenuti nelikvidni sektori su takođe i ispod norme postavljene na nivou celine realnog sektora. Kada posmatramo sektorski prikaz solventnosti, a na osnovu pokrća stalne imovine dugoročnim izvorima finansiranja, uvidamo da su sektori rudarstva, prerađivačke industrije i trgovine najsolventniji (respektivno 1,18; 1,27; 1,54). Ovaj pokazatelj smatra se minimalno potrebnim da bi se moglo govoriti o solventnosti kompanije tj sektora u ovom slučaju, jer uzima u obzir sve dugoročne izvore iz pasive. Zanimljivo je napomenuti da su svi ostali sektori ispod proseka na nivou realnog sektora privrede. Sa istog aspekta, najnesolventnije rezultate zabeležili su sektori saobraćaja, smeštaja i ishrane i umetnosti, zabave i rekreacije. S druge strane, svi sektori, sa izuzetkom sektora trgovine, beleže nedovoljno dobre rezultate kada je u pitanju pokrća stalne imovine sopstvenim kapitalom. Ovo iz razloga što je pre retkost nego pravilo da preduzeća mogu da finansiraju stalnu imovinu samo iz kapitala. Zaduživanje je skoro uvek neophodno, pogotovo ako se radi o kompanijama sa visokim kapitalnim investicijama. Kada je u pitanju pokazatelj pokrća kapitala prema ukupnim obavezama, ne postoji usaglašeno mišljenje o optimalnom odnosu između kapitala i obaveza, odnosno idealnoj strukturi kapitala. Ovaj pokazatelj zavisi od mnogih faktora kao što su raspoloživost različitih izvora finansiranja, finansijske politike preduzeća itd. Međutim, smatra se da postoji uska međuzavisnost između vrste delatnosti i vrednosti ovog koeficijenta. U tom smislu, određenu zabrinutost izazivaju sektor građevinarstva, koji kontinuirano uvećava udeo obaveza a smanjuje udeo kapitala u pasivi, kao i sektor saobraćaja koji je u 2018. god imao značajan primat udela kapitala, da bi u 2019. god taj primat, prešao na stranu obaveza (sa 1,23 na 0,67), što se retko dogodi na nivou jedne godine a u celom sektoru. U sektoru saobraćaja, došlo je naime do porasta dugoročnih obaveza za svega 2%, ali je sa druge strane došlo i do drastičnog smanjenja kapitala (43,47%), kao posledica i smanjenja osnovnog kapitala (44,06%), a i smanjenja neraspoređenog dobitka (23,36%), koji je delimično upotrebljen za umanjeње gubitaka iz prethodnih perioda. S obzirom da je u sektoru saobraćaja došlo do povećanja broja privrednih subjekata iz 2018. god u 2019. god, ovo veliko smanjenje osnovnog kapitala dodatno zabrinjava, jer je očigledno reč o dekapitalizaciji, odnosno o smanjenju osnovnog kapitala za potrebe umanjeња gubitaka. Ovakav trend može dodatno ugroziti dugoročnu stabilnost sektora saobraćaja i usloviti da veliki broj preduzeća ovog sektora počne da posluje sa gubitkom iznad kapitala, što posledično vodi u blokade i stečaj i što će posebno ugroziti opstanak kada se ovim parametrima pridruže i parametri narednih kriznih godina. Ovaj sektor takođe beleži i pad opšteg racia likvidnosti, koji je već nekoliko godina unazad i ispod norme i ispod proseka realnog sektora, kao i pad svih ostalih parametara likvidnosti, što ukazuje da problem u sektoru saobraćaja nije samo dugoročna već i kratkoročna finansijska stabilnost. Ogroman pad sektor saobraćaja ostvario je i u slobodnom neto novčanom toku, gde je sa 341.173.032 hiljada dinara u 2018. god opao na - 196.587.808 hiljada

dinara u 2019.god dakle za 537.760.840 hiljada dinara, što ovaj sektor čini najmanje uspešnim kada je ovaj pokazatelj u pitanju. Pomenuto dovodi u pitanje ne samo nove investicije u ovom sektoru, nego i mogućnost plaćanja svih, kako kratkoročnih tako i dugoročnih obaveza, a koje su se iz 2018. god u 2019. god čak i povećale.

Shodno svemu rečenom, kao posledica, neto finansijski dug se uvećao i na nivou realnog sektora privrede, kao i u svim pojedinačnim sektorima, sa izuzetkom sektora prerađivačke industrije i sektora električne energije, u kojima smanjenja finansijskog duga nisu tako ubedljiva kao povećanja neto finansijskog duga u ostalim sektorima. Najveće povećanje finansijskog duga dogodio se upravo u sektoru saobraćaja, što ukazuje na ozbiljne tekuće, kao i ozbiljne nastupajuće probleme ovog sektora.

U pogledu ujednačenosti brzine naplate potraživanja sa isplatom obaveza, čak i sektori koji beleže uopšteno najbolje rezultate u ovoj analizi, kao što su prerađivačka industrija i trgovina, nemaju ujednačen odnos naplate potraživanja sa isplatom obaveza. Trgovina je značajno smanjila ovaj pokazatelj sa 0,7 na 0,58, što upućuje na docnju u isplati obaveza a sve veću otežanost u naplati potraživanja. Sličan odnos dogodio se i u prerađivačkoj industriji gde je pokazatelj opao sa 0,9 na 0,77. Prevashodni problem leži u efikasnosti upravljanja zalihama sektora prerađivačke industrije gde je prosečan period obrta zaliha, čak 305 dana godišnje. Prosečan period naplate potraživanja za isti sektor je 275 dana, što znači da je potrebno čak 580 dana da se zalihe konvertuju u gotovinu, kao poželjnog likvidnog oblika, što je izuzetno dug period, jer je reč o godinu i po dana. S obzirom da je prerađivačka industrija jedan od najboljih sektora u pogledu i likvidnosti i solventnosti, možemo zaključiti da je jedan od osnovnih problema svih sektora, efikasnost u upravljanju zalihama, usporena naplata potraživanja i docnja u isplati obaveza.

U sektoru poljoprivrede došlo je do porasta skoro svih pokazatelja likvidnosti, što će naročito povoljno uticati na održanje dobrih rezultata i u 2020. i 2021. godini, iako će ovi pokazatelji sasvim sigurno biti nešto lošiji, budući da su svi sektori pretrpeli pritisak u uslovima otežanog poslovanja tokom krize izazvane virusom. Stoga je moguće da u budućnosti poljoprivreda bude jedan od glavnih poluga privrednog rasta. Razlog dobrih rezultata sektora poljoprivrede leži u činjenici da je došlo do rasta obrtno imovine (2,79%), u okviru koje najveći rast beleže potraživanja od kupaca (4,47%) i gotovina od čak 14,03%, kao najlikvidnijih oblika obrtno imovine. Istovremeno beleži se pad kratkoročnih obaveza od 1,71%. Ipak, došlo je i do pada kratkoročnih finansijskih plasmana, što sugerise na preraspodelu ulaganja u nemonetarne oblike obrtno imovine i na šta treba obratiti pažnju, budući da se radi o visokolikvidnom obliku ulaganja. Ove kompanije, zbog prirode svoje delatnosti moraju imati visok udeo obrtno imovine u zalihama, kao najlikvidnijeg oblika, te ako bi došlo do problema u naplati u nastupajućem periodu i ova veoma dobra likvidnost poljoprivrede može biti narušena jer će onda automatski doći i do problema u isplati obaveza. Iako dugoročne obaveze beleže rast od 9,3%, njihov rast nije narušio balans u dugoročnom finansiranju. Poljoprivreda beleži i rast kapitala, prvenstveno rasta neraspoređenog dobitka (10,8%), što se smatra zdravim rastom, a došlo je i do rasta osnovnog kapitala (2,09%). Budući da je broj privrednih društava ostao približno isti u obe posmatrane godine, čak je i rast osnovnog kapitala posledica dokapitalizacija, a ne rasta osnovnog kapitala po osnovu novoosnovanih preduzeća. Pokazatelj pokrića stalne imovine kapitalom pokazuje da kapital poljoprivrede nije dovoljan za finansiranje stalne imovine, ali kao što je već napomenuto, retko od koje

kompanije pa samim tim i sektora, možemo očekivati potpunu pokrivenost stalne imovine kapitalom. Jedini sektor koji u tome uspeva je trgovina.

Sektori koji će imati najveće probleme i u pogledu likvidnosti i u pogledu solventnosti su sasvim sigurno saobraćaj, smeštaj i ishrana, umetnost, zabava i rekreacija, a vrlo verovatno i građevinarstvo.

Tabela 2. Izabrani pokazatelji solventnosti za pojedinačne sektore, 2018 – 2019. god

	Realni sektor-celina		Poljoprivreda		Rudarstvo		Prerađivačka ind.		El. Energija	
Solventnost	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
PSISK	0,8	0,82	0,89	0,88	0,84	0,85	0,94	0,90	0,75	0,70
PSIDIF	1,12	1,12	1,09	1,07	1,18	1,19	1,27	1,24	0,94	0,87
PKUO	0,79	0,81	1,48	1,44	1,38	1,32	0,74	0,67	1,85	1,46
NOK	1.109.084.012	1.056.552.332	52.269.726	42.799.901	77.254.756	78.297.990	464.059.383	395.167.025	-100.475.753	-205.900.796
NFD	2.171.523.906	1.956.138.990	118.150.174	112.781.909	64.127.777	49.889.160	534.547.672	602.034.604	159.308.813	260.149.888
FCF	1.413.354.009	1.865.384.502	48.124.671	74.911.910	94.719.352	163.571.642	499.001.284	389.504.729	133.634.266	164.934.364

	Građevinarstvo		Trgovina		Saobraćaj		Smeštaj i ishrana		Umetnost, zabava i rekreacija	
Solventnost	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
PSISK	0,71	0,72	1,15	1,17	0,61	0,80	0,59	0,60	0,76	0,73
PSIDIF	1,09	1,03	1,54	1,54	0,93	1,03	0,92	0,89	0,85	0,92
PKUO	0,57	0,65	0,55	0,55	0,67	1,23	0,66	0,68	1,61	1,17
NOK	101.396.359	31.463.834	506.183.851	464.736.799	-39.400.977	23.871.594	-13.414.762	-15.128.549	-10.615.326	-4.957.775
NFD	432.204.169	347.492.764	275.637.803	270.927.985	182.139.284	83.392.071	48.891.609	42.231.946	238.171	10.320.796
FCF	415.304.287	233.819.068	362.605.529	257.525.157	-196.587.808	341.173.032	33.794.991	20.927.161	16.852.576	21.025.235

Izvor: Proračun autora na bazi podataka APR

ZAKLJUČAK

Zahvaljujući jezgru privrede, kao što su prerađivačka industrija i trgovina, koji ostvaruju značajno veće prihode od svih ostalih sektora, zaključujemo da se ni ukupni prihodi realnog sektora, a samim tim ni pokazatelji profitabilnosti neće značajno promeniti u 2020. god. Ono što ostaje kao suštinski problem privrede, a na šta je ukazano u radu, jesu problemi likvidnosti i u dosta većoj meri solventnosti. Prikazani problemi, a posebno solventnost, će se zbog svoje prirode (dugoročnosti) tek razvijati u narednim godinama, a moguće je i znatno pogoršanje likvidnosti već u 2021. god. Ono na šta bi preduzeća trebala da obrate pažnju jesu bolja racionalizacija troškova poslovanja, adekvatnije upravljanje svim delovima imovine, a naročito zalihama i potraživanjima, gde je posebno važna ažurnija naplata potraživanja od svojih dužnika jer bi na taj način obezbedili i veći priliv novca kojim bi pokrili svoje dugove. Razlog zbog kojeg neke kompanije ne preduzimaju mere oporavka najčešće leži u tome da menadžment preduzeća kasno uočava ozbiljnost problema, posebno kada je solventnost u pitanju, jer se radi o otplati dugova na duži rok, dakle u periodu od nekoliko godina, te često dolaze u situaciju da je prekasno učiniti bilo šta. Nelikvidnost privrede je hroničan

problem, strukturnog je karaktera, predstavlja rezultantu neefikasnosti poslovanja i visokog stepena volatilnosti na uticaj egzogenih varijabli. U pogledu solventnosti možemo zaključiti da je jedan od osnovnih problema svih sektora, efikasnost u upravljanju zalihama, usporena naplata potraživanja i docnja u isplati obaveza. U privredi uvek postoji međusobna povezanost i uslovljenost poslovanja između kupaca i dobavljača, a činjenica da je mnogo veći broj kompanija u blokadi govori i u prilog stavu da je veliki broj blokiranih kompanija, blokirani od strane njegovih poslovnih partnera, kao oblika odbrane od sopstvene nelikvidnosti. Privreda Srbije u realnom sektoru ima i dalje veliki problem nelikvidnosti, uprkos blagim poboljšanjima. U pogledu ukupnih prihoda za 2020. god ne očekujemo značajne promene, iako se pad prihoda svakako prognozira. Likvidnost privrede će ostati ili nepromenjena ili će biti blago pogoršana, dok solventnost privrede traži posebnu pažnju, jer ukoliko se nastavi pravac kojim se ide već nekoliko godina unazad, možemo očekivati značajna i nagla pogoršanja u 2020. god koji bi se produbili i u nastupajućim godinama.

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LIQUIDITY AND SOLVENCY ANALYSIS OF THE REAL SECTOR OF THE ECONOMY OF SERBIA FOR 2018-2019

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Summary: *Issues of liquidity and solvency of companies, and not only issues of profitability, are crucial in the context of considering the future business of companies, and thus the economic sectors and the economy as a whole. For several years now, the required short-term funds are still not enough to service current liabilities. Liquidity rates are at half of a satisfactory level, while the growth of long-term loans, together with equity, is still not sufficient to finance fixed assets (solvency). Liquidity and solvency issues affect both the efficiency and productivity of the company, and indirectly the profitability. Based on the available information, the paper discusses the results of the real sector of the Serbian economy for the period 2018-2019, in the context of liquidity and solvency, as well as selected individual sectors, using generally accepted indicators. In the new crisis caused by the COVID 19 virus, companies have found themselves in a position where many of them need additional capital in order to improve and harmonize their financial structure. The illiquidity of the economy is a chronic problem, it is structural in its nature, which is the result of business inefficiency and a high degree of volatility on the impact of exogenous variables. In terms of solvency, we can conclude that one of the basic problems of all sectors is efficiency in inventory management, slow collection of receivables and late payment of liabilities. If we add the IMF forecasts, to this already disrupted structure of the solvency of the economy, ie the real sector, in which, the share of insolvent companies in developing countries will increase by between 14% and 30% in 2020, (due to the pandemic), we can be not optimistic. On the other hand, we must emphasize that the forecasts of economic growth for the countries of the region in 2021 are fairly optimistic, and for Serbia the predicted growth is 6.1%. The result of the analysis points to the conclusion that there will be no significant changes in terms of revenue and profitability of the real sector in the short term, but that the crisis caused by coronavirus will mostly affect small, micro and medium enterprises when it comes to liquidity and solvency, in this respect. In the long run, impaired solvency, and after that liquidity, will affect the still intact profitability of the sector. In that regard, solvency issues have a more significant impact, because in the long run, if corrective measures are not being taken, they will cause the inability of the companies to pay long-term overdue liabilities, and increase the number of companies operating without equity and the number of blocked companies. The sectors that will have the biggest problems in terms of liquidity and solvency are certainly transport, accommodation and tourism, art, entertainment and recreation, and very likely construction.*

Keywords: liquidity; solvency; sector analysis; economic trends.

The JEL Classification: E37



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Peter, C. (2013). Privatization, urban fragmentation, and sustainable development. In: *Institutional and Social Innovation for Sustainable Urban Development*, Mieg, H. A., Töpfer, K. (ur.). Oxon i New York: Routledge: 130-146.

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Articles in journals: last name, initials. (year) Article title. Name of journal, volume (number): pages. (if there are two or three authors, their last names and initials should be listed in order, separated by a comma)

Giddings, B., Hopwood, B., O'Brien, G. (2002). Environment, economy and society: fitting them together into sustainable development. *Sustainable Development*, 10(4): 187-196.

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The author relies on the relevant general research conducted to date in the field of work in question		

Appropriate methodology has been applied		
Methodology has been precisely defined		
The author compares relevant research conducted to date in the selected area with his/her own research		
The interpretation of research results is valid		
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The paper provides new and original contribution		
The paper's style of writing and language are clear		
The paper uses tables, charts and figures in an appropriate and clear manner		
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