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ПРЕГЛЕДНИ НАУЧНИ РАДОВИ / SCIENTIFIC REVIEW ARTICLE

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CONCEPTUALIZATION OF INDEX METHODOLOGY FOR MEASURING MANAGER'S SATISFACTION WITH THEIR JOB, PRIVATE LIFE AND WORK/LIFE BALANCE

Abstract

In the era of knowledge economy, company's competitive advantage is mostly created by skills and knowledge of its employees, especially managers as the most significant segment of company's human intellectual capital. The subject of this paper is manager's work/life balance and possibility of its measurement. Balanced and satisfied managers represent a good foundation for achieving company's goals. The paper will present certain subjective factors and company factors that can affect manager's work/life balance. Within these factors, various practices and benefits for establishing manager's work/life balance can be distinguished, depending on whether they are created by companies and offered to their managers, or they are designed and implemented by managers themselves outside the company. The purpose of this paper is presenting the conceptual model of interdependence of manager's job satisfaction, manager's private life satisfaction and manager's work/life balance satisfaction, which includes dimensions of each of these types of manager's satisfaction that managers can assess through a questionnaire. Based on this model and managers' grades, the result of this paper is reflected in the created index methodology for calculating the values of indices of the mentioned types of manager's satisfaction, which can be applied at the level of the individual manager as well as at the level of the company, and it can also be used for comparing the values of determined satisfaction indices by managers, by years and between companies.

Key words: work/life balance, job satisfaction, private life satisfaction, manager satisfaction index

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КОНЦЕПТУАЛИЗАЦИЈА ИНДЕКСНЕ МЕТОДОЛОГИЈЕ ЗА МЕРЕЊЕ САТИСФАКЦИЈЕ МЕНАЏЕРА ПОСЛОМ, ПРИВАТНИМ ЖИВОТОМ И УСКЛАЂЕНОШЋУ ПОСЛА И ПРИВАТНОГ ЖИВОТА

Апстракт

У ери економије знања, конкурентску предност предузећа већином креирају вештине и знања његових запослених, нарочито менаџера као најзначајнијег сегмента хуманог интелектуалног капитала предузећа. Предмет овог рада представља усклађеност посла и приватног живота менаџера и могућност за њено мерење. Усклађени и задовољни менаџери представљају добру основу за постизање циљева предузећа. У раду ће бити презентовани одређени субјективни фактори и фактори предузећа који могу утицати на усклађеност посла и приватног живота менаџера. У оквиру ових фактора могу се издвојити различите праксе и погодности за постизање усклађености посла и приватног живота менаџера, у зависности од тога да ли су креиране од стране предузећа и понуђене њиховим менаџерима, или су осмишљене и примењене од стране самих менаџера ван предузећа. Сврха овог рада је презентовање концептуалног модела међузависности сатисфакције менаџера послом, сатисфакције менаџера приватним животом и сатисфакције менаџера усклађеношћу посла и приватног живота, који укључује димензије сваке врсте сатисфакције менаџера које менаџери могу да оцене путем анкетног упитника. На основу овог модела и оцена менаџера, резултат овог рада огледа се у креираној индексној методологији за мерење вредности индекса наведених врста сатисфакције менаџера, која се може применити како на нивоу појединих менаџера тако и на нивоу целог предузећа, а такође се може користити и за поређење вредности утврђених индекса сатисфакције по менаџерима, годинама и компанијама.

Кључне речи: усклађеност посла и приватног живота, задовољство послом, задовољство приватним животом, индекс сатисфакције менаџера

Introduction

Managers with their specific skills, knowledge and experience are considered a key resource and the most significant factor of gaining and maintaining competitive advantage of contemporary companies, which can contribute to the achievement of the company's results both through their own commitment and through motivating their team members. On the other hand, due to the nature of manager's job, the modern way of manager's work and life is often characterized by overtime work, high stress level, and certain health problems such as cardiovascular disorders, physical pain, sleep deprivation, anxiety or depression (Frone, 2000).

Manager's work/life balance represents one of the three biggest challenges for the human resources sector in contemporary companies (McCarthy, Darcy & Grady, 2010). Therefore, companies within their branding strategies should tend to attract, develop and

retain the best quality managers, while striving to contribute to establishing their work/life balance by offering various practices and benefits to managers, thereby differentiating themselves on the labor market and creating a reputation of an innovative and desirable employer that follows modern trends (Ivanović-Đukić & Đorđević, 2005). Therefore, work/life balance benefits can be considered a "win-win" solution for both managers and companies (Mladenović, 2020).

Research conducted by Fapohunda (2014) showed that 68% of bank managers in Nigeria were under constant stress at work and that 74% of managers did not have enough time for their families after work. Another survey conducted by Lockwood (2003) found that 70% of over 1,500 employees felt that they had not established work/life balance. Furthermore, research results by the IBM Institute for Business Value (2020) indicate a huge gap between the perception of employers and employees - as many as 86% of employers and only 46% of employees perceive their companies to really consider work/life balance of their employees. Therefore, employees in the human resources sector of companies should put more emphasis on listening and considering the needs of their managers and other employees.

The main objectives (goals) of this paper are to answer the following research questions:
1. Which dimensions of manager's satisfaction with their job, private life and work/life balance can be defined?
2. How can the level of manager's satisfaction with their job, private life and work/life balance be measured?
3. How can the measured level of manager's satisfaction with their job, private life and work/life balance be compared by managers, by years and between companies?

In order to answer these research questions, the authors will first explain certain determinants of manager's work/life balance, grouped into subjective factors and company factors, including various work/life balance practices that managers can apply both at home and at work. Afterwards, the authors will present the created conceptual model of interdependence of manager's job satisfaction, private life satisfaction and work/life balance satisfaction based on previous literature research. Finally, the authors will explain the created index methodology for calculating the values of indices of manager's satisfaction, which can be used for comparison between managers and companies, as well as comparison within the same company by years. The illustrated examples of calculating manager's satisfaction indices in this paper are based on managers' hypothetical grades of their satisfaction dimensions through a questionnaire.

Concept and determinants of manager's work/life balance

Work/life balance can be defined as achieving satisfaction with the state, situation and experience in both spheres of life through investing a satisfactory level of commitment, effort, energy and time in both work and private activities (Postolov et al., 2019). Friedman & Greenhaus (2000) view work and private life as allies instead of enemies, claiming that performing work tasks does not interfere with performing private activities and vice versa, but rather that positive experience in one life sphere contributes to achieving success in the

other one. Therefore, work/life balance can be established by placing enough "weight" on work activities while maintaining a healthy "counterweight" in the form of personal interests and quality relationships with friends and family members (Mladenović, 2020). Determinants (factors) that can affect manager's work/life balance can be grouped into: 1) subjective factors and 2) company factors (Gilbreath, 2004; Koekemoer & Mostert, 2010).

1) *Subjective factors* of manager's work/life balance include: A) manager's personal characteristics, B) private support from manager's family members and friends, as well as C) private work/life balance practices that managers can apply outside the company (Koekemoer & Mostert, 2010).

A) Manager's *personal characteristics* that can affect their work/life balance include: internal locus of control, workaholism, ability of working under stress, time management ability, and positive outlook on life (Simard, 2011).

B) Manager's *private support* consists of open and honest communication, empathy and understanding by their family members and friends, as well as providing support and help in taking care of children and performing household chores and other private duties (Walsh, 2002).

C) The most important *private* work/life balance *practices* that managers can apply outside the company include: privately attending workshops, training and education of personal development, privately hiring a coach outside the company, and practicing fun, relaxing and sports activities (Bird, 2006).

2) *Company factors* of manager's work/life balance include: A) characteristics of manager's job, B) characteristics of company's organizational culture, communication and support from manager's superiors and colleagues, as well as C) work/life balance practices and benefits that companies can offer managers (Gilbreath, 2004).

A) *Characteristics of manager's job* include: management of activities and people, challenging work tasks, flexibility and autonomy in decision-making, number of working hours, and stress at work (Ford & Collinson, 2011).

B) *Organizational culture* represents a common system of values, beliefs, attitudes and behavior norms, as well as way of *communication* and support from superiors and colleagues, that are adopted and shared by managers and other employees in the company, providing them with a sense of belonging (Burke, 2010).

C) Work/life balance *practices and benefits* that *companies* can offer managers include: flexible work arrangements (flexible working hours, part-time work, compressed work week, and working from home), days off and annual leave, maternity leave, childcare and elderly care, workshops and education of professional and personal development, mentoring and coaching programs, as well as fun, sports and relaxing activities (Mladenović & Krstić, 2021b).

Conceptual model of interdependence of manager's job satisfaction, manager's private life satisfaction and manager's work/life balance satisfaction

For the purpose of researching the interdependence of manager's job satisfaction, manager's private life satisfaction and manager's work/life balance satisfaction, a specific conceptual model was created based on previous empirical research from various countries (Crozier-Durham, 2007; Herlin, 2010; Mukhtar, 2012; Riley, 2012; Stepanova, 2012;

Mladenović, 2022). This conceptual model includes the following variables (Figure 1):

- characteristics (nature) of manager's job, as a dimension of manager's job satisfaction,
- characteristics of organizational culture, communication and manager's support at work, as a dimension of manager's job satisfaction,
- company practices for establishing manager's work/life balance, as a dimension of manager's job satisfaction,
- manager's job satisfaction, as a dimension of manager's work/life balance satisfaction,
- manager's personal characteristics, as a dimension of manager's private life satisfaction,
- manager's support at home, as a dimension of manager's private life satisfaction,
- private practices for establishing manager's work/life balance, as a dimension of manager's private life satisfaction,
- manager's private life satisfaction, as a dimension of manager's work/life balance satisfaction,
- manager's work/life balance satisfaction.

Figure 1: Conceptual model of interdependence of manager's job satisfaction, manager's private life satisfaction and manager's work/life balance satisfaction
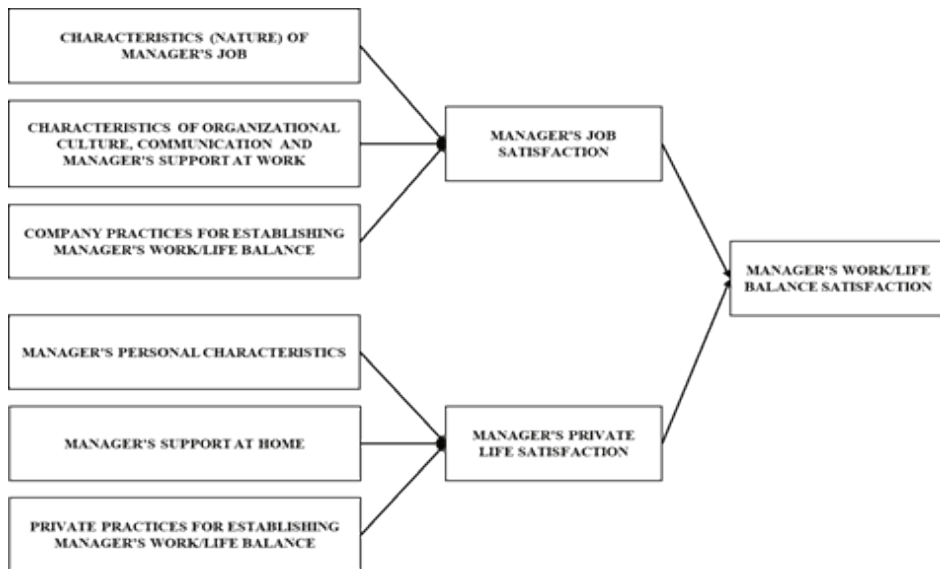
Source: Adapted from: Mladenović, M. (2022). Usklađenost posla i privatnog života kao determinanta produktivnosti menadžera i preduzeća u Republici Srbiji. Doktorska disertacija.

Within the conceptual model of interdependence of manager's job satisfaction, manager's private life satisfaction and manager's work/life balance satisfaction, an index methodology for measuring this interdependence was created, both at the level of the

individual manager and at the level of the company. This methodology, based on the methodology developed by Krstić & Janković-Milić (2002) and adapted by Mladenović (2022) with regard to managers as research subjects, includes the following indices:

- manager's job satisfaction index,
- manager's private life satisfaction index,
- manager's work/life balance satisfaction index.

The created index methodology enables measuring:

- satisfaction of each manager with each dimension of satisfaction separately,
- satisfaction of each manager with all dimensions of satisfaction in total,
- satisfaction of all managers with each dimension of satisfaction separately,
- satisfaction of all managers with all dimensions of satisfaction in total.

The mentioned indices can be determined by conducting a survey on managers through a questionnaire, where managers can evaluate with grades 1-5 the degree of agreement with various statements grouped by previously mentioned variables. The 5-point Likert scale used in the created index methodology includes the following grades for assessing the degree of agreement with different statements in the survey: 1 - I completely disagree, 2 - I disagree, 3 - I neither agree nor disagree, 4 - I agree and 5 - I completely agree. Given that the chosen evaluation scale has the grades within the range of 1-5, the index value will also range 1-5. In the following parts of the paper, tables will be presented that illustrate the method of determining the presented satisfaction indices on the example of a hypothetical company which has a total of 5 managers.

Manager's job satisfaction index - conceptualization and methodology of index determination

Manager's job satisfaction can be measured through a questionnaire with questions most often including the following topics: working conditions, availability of resources for performing work tasks, job content (types of work activities), decision-making freedom, communication with superiors and team members, compensation package, awards and recognition for excellent results, opportunities for learning, development and career advancement, as well as practices and benefits for balancing work and private life offered by the company (Warier, 2014, p. 230).

The mentioned topics can be grouped into dimensions of manager's job satisfaction. Based on the aforementioned research, the previously presented dimensions of manager's job satisfaction which are defined within the created conceptual model are (Figure 1):

- characteristics (nature) of manager's job,
- organizational culture, communication and manager's support at work,
- company practices for establishing manager's work/life balance.

Managers evaluate the specified dimensions of their job satisfaction with grades 1-5 in the questionnaire, whereby the dimensions of job satisfaction themselves or various individual pre-defined statements related to each dimension of job satisfaction can be evaluated, depending on the needs of the company for research. Based on the

manager's grades, manager's job satisfaction index can be determined at the individual level (MJSI) and at the company level (CJSI).

Manager's job satisfaction index at the individual level (MJSI) can be calculated through average grades of each individual manager for all dimensions of manager's job satisfaction, based on the methodology provided by Krstić & Janković-Milić (2002) and adapted by Mladenović (2022):

$$MJSI_i = \frac{JS_{1i} + JS_{2i} + \cdots + JS_{ai}}{a}$$

JS - grade of manager's job satisfaction
i = 1, 2, ..., n
n - number of managers
a - number of dimensions of manager's job satisfaction or number of statements in the questionnaire related to each dimension of manager's job satisfaction

Manager's job satisfaction index at the company level (CJSI) can be determined through average grades of all managers in the company for all dimensions of manager's job satisfaction, based on the methodology given by Krstić & Janković-Milić (2002) and adapted by Mladenović (2022):

$$CJSI = \frac{\overline{JS}_1 + \overline{JS}_2 + \cdots + \overline{JS}_a}{a}$$

$$\overline{JS}_a = \frac{\sum_{i=1}^{n} JS_{ai}}{n}$$

$\overline{JS}$ - average grade of manager's job satisfaction

Table 1 shows the method of determining manager's job satisfaction index at the individual level (MJSI) and at the company level (CJSI) on the example of a hypothetical company with 5 managers in total.

In the columns in Table 1, hypothetical grades 1-5 of each of the 5 managers individually for each dimension of manager's job satisfaction are given. First, manager's job satisfaction indices of each of the 5 managers at the individual level (MJSI$_1$-MJSI$_5$) are calculated as the average of the grades of each individual manager for all dimensions of manager's job satisfaction. Afterwards, manager's job satisfaction index at the company level (CJSI) is determined as the average of the grades of all 5 managers in the company for all dimensions of manager's job satisfaction (JS$_I$-JS$_{III}$).

Table 1: Example of calculating manager's job satisfaction index at the individual level (MJSI) and at the company level (CJSI)

DMJS	M1	M2	M3	M4	M5	$\overline{JSa}$
I - JC	$JS_{11} = 3$	$JS_{12} = 4$	$JS_{13} = 4$	$JS_{14} = 5$	$JS_{15} = 3$	$\overline{JS_{I}} = 19 / 5 = 3,8$
II - OC	$JS_{21} = 4$	$JS_{22} = 5$	$JS_{23} = 3$	$JS_{24} = 5$	$JS_{25} = 5$	$\overline{JS_{II}} = 22 / 5 = 4,4$
III - CP	$JS_{31} = 4$	$JS_{32} = 4$	$JS_{33} = 3$	$JS_{34} = 4$	$JS_{35} = 4$	$\overline{JS_{III}} = 19 / 5 = 3,8$
MJSI	$MJSI_1 =$ 11 / 3 = **3,67**	$MJSI_2 =$ 13 / 3 = **4,33**	$MJSI_3 =$ 10 / 3 = **3,33**	$MJSI_4 =$ 14 / 3 = **4,67**	$MJSI_5 =$ 12 / 3 = **4**	$CJSI = (3,8 + 4,4 + 3,8) / 3 = 12 / 3 = 4$

M1 - M5 - manager 1 - manager 5
MJSI - manager's job satisfaction index at the individual level
CJSI - manager's job satisfaction index at the company level
DMJS - dimensions of manager's job satisfaction:
I - JC - characteristics (nature) of manager's job
II - OC - organizational culture, communication and manager's support at work
III - CP - company practices for establishing manager's work/life balance

Source: Adapted from: Mladenović, M. (2022). Usklađenost posla i privatnog života kao determinanta produktivnosti menadžera i preduzeća u Republici Srbiji. Doktorska disertacija.

Based on the presented calculation in Table 1, it can be concluded that manager 4 has the highest manager's job satisfaction index ($MJSI_4 = 4,67$), followed by manager 2 ($MJSI_2 = 4,33$), manager 5 ($MJSI_5 = 4$) and manager 1 ($MJSI_1 = 3,67$), while manager 3 has the lowest manager's job satisfaction index ($MJSI_3 = 3,33$). Manager's job satisfaction index at the company level (CJSI) is 4 and it represents the overall average grade of manager's job satisfaction of all 5 managers in the company.

Manager's private life satisfaction index - conceptualization and methodology of index determination

Manager's private life satisfaction can be measured through a questionnaire, the questions of which usually include the following aspects: living conditions, communication with family members and friends, feeling of fulfillment, stress, time available for private life, conscious presence (mindfulness), as well as activities for balancing work and private life privately practiced by managers (Nosak & Zubanov, 2013).

The mentioned aspects can be grouped into dimensions of manager's private life satisfaction. Within the created conceptual model, based on the aforementioned research, the previously presented dimensions of manager's private life satisfaction are (Figure 1):
- manager's personal characteristics,
- manager's support at home,
- private practices for establishing manager's work/life balance.

In a similar way to determining manager's job satisfaction index, with grades 1-5 in the questionnaire, managers evaluate the defined dimensions of their private life satisfaction, whereby they can evaluate the dimensions of private life satisfaction or individual pre-defined statements related to each dimension of private life satisfaction, depending on the company's needs for research. After obtaining the manager's grades, manager's private life satisfaction index can be calculated at the individual level (MLSI) and at the company level (CLSI).

Manager's private life satisfaction index at the individual level (MLSI) can be calculated through average grades of each individual manager for all dimensions of manager's private life satisfaction, based on the methodology provided by Krstić & Janković-Milić (2002) and adapted by Mladenović (2022):

$$MLSI_i = \frac{LS_{1i} + LS_{2i} + \cdots + LS_{bi}}{b}$$

LS - grade of manager's private life satisfaction
i = 1, 2, ..., n
n - number of managers
b - number of dimensions of manager's private life satisfaction or number of statements in the questionnaire related to each dimension of manager's private life satisfaction

Manager's private life satisfaction index at the company level (CLSI) can be determined through average grades of all managers in the company for all dimensions of manager's private life satisfaction, based on the methodology given by Krstić & Janković-Milić (2002) and adapted by Mladenović (2022):

$$CLSI = \frac{\overline{LS_1} + \overline{LS_2} + \cdots + \overline{LS_b}}{b}$$

$$\overline{LS_b} = \frac{\sum_{i=1}^{n} LS_{bi}}{n}$$

$\overline{LS}$ - average grade of manager's private life satisfaction

Table 2 shows the method of determining manager's private life satisfaction index at the individual level (MLSI) and at the company level (CLSI) on the example of a hypothetical company with a total of 5 managers.

In Table 2, the columns show hypothetical grades 1-5 of each of the 5 managers individually for each dimension of manager's private life satisfaction. First, manager's private life satisfaction indices of each of the 5 managers at the individual level ($MLSI_1$-$MLSI_5$) are calculated as the average of the grades of each individual manager for all dimensions of manager's private life satisfaction. Afterwards, manager's private life satisfaction index at the company level (CLSI) is determined as the average of the grades of all 5 managers in the company for all dimensions of manager's private life satisfaction (LS_I-LS_{III}).

Table 2: Example of calculating manager's private life satisfaction index at the individual level (MLSI) and at the company level (CLSI)

DMLS	M1	M2	M3	M4	M5	$\overline{LSb}$
I - MC	$LS_{11} = 5$	$LS_{12} = 4$	$LS_{13} = 3$	$LS_{14} = 4$	$LS_{15} = 5$	$\overline{LS_I} = 21 / 5 = 4{,}2$
II - MS	$LS_{21} = 5$	$LS_{22} = 4$	$LS_{23} = 4$	$LS_{24} = 5$	$LS_{25} = 4$	$\overline{LS_{II}} = 22 / 5 = 4{,}4$
III - MP	$LS_{31} = 5$	$LS_{32} = 2$	$LS_{33} = 4$	$LS_{34} = 4$	$LS_{35} = 3$	$\overline{LS_{III}} = 18 / 5 = 3{,}6$
MLSI	$\mathbf{MLSI_1 =}$ $\mathbf{15 / 3 = 5}$	$\mathbf{MLSI_2 =}$ $\mathbf{10 / 3 =}$ $\mathbf{3{,}33}$	$\mathbf{MLSI_3 =}$ $\mathbf{11 / 3 =}$ $\mathbf{3{,}67}$	$\mathbf{MLSI_4 =}$ $\mathbf{13 / 3 =}$ $\mathbf{4{,}33}$	$\mathbf{MLSI_5 =}$ $\mathbf{12 / 3 = 4}$	$\mathbf{CLSI} = (4{,}2 + 4{,}4 + 3{,}6) / 3 = 12{,}2 / 3 = \mathbf{4{,}07}$

M1 - M5 - manager 1 - manager 5

MLSI - manager's private life satisfaction index at the individual level

CLSI - manager's private life satisfaction index at the company level

DMLS - dimensions of manager's private life satisfaction:

I - MC - manager's personal characteristics

II - MS - manager's support at home

III - MP - private practices for establishing manager's work/life balance

Source: Adapted from: Mladenović, M. (2022). Usklađenost posla i privatnog života kao determinanta produktivnosti menadžera i preduzeća u Republici Srbiji. Doktorska disertacija.

Based on the presented calculation in Table 2, it can be concluded that manager 1 has the highest (and at the same time the maximum possible) manager's private life satisfaction index ($MLSI_1 = 5$), followed by manager 4 ($MLSI_4 = 4{,}33$), manager 5 ($MLSI_5 = 4$) and manager 3 ($MLSI_3 = 3{,}67$), while manager 2 has the lowest manager's private life satisfaction index ($MLSI_2 = 3{,}33$). Manager's private life satisfaction index at the company level (CLSI) is 4,07 and it represents the overall average grade of manager's private life satisfaction of all 5 managers in the company.

Manager's work/life balance satisfaction index - conceptualization and methodology of index determination

Manager's job satisfaction and manager's private life satisfaction represent dimensions of manager's work/life balance satisfaction. Therefore, after calculating manager's job satisfaction index at the individual level (MJSI) and at the company level (CJSI), as well as manager's private life satisfaction index at the individual level (MLSI) and at the company level (CLSI), manager's work/life balance satisfaction index can be determined at the individual level (MWLBSI) and at the company level (CWLBSI).

Manager's work/life balance satisfaction index at the individual level (MWLBSI) can be calculated by weighting manager's job satisfaction index at the individual level (MJSI) and manager's private life satisfaction index at the individual level (MLSI). The weight

of 0,5 i.e. 50% is used considering that balance represents establishing alignment between manager's work and private life:

$$MWLBSI_i = MJSI_i * 0,5 + MLSI_i * 0,5$$

i = 1, 2, ..., n

n - number of managers

Manager's work/life balance satisfaction index at the company level (CWLBSI) can be determined by weighting manager's job satisfaction index at the company level (CJSI) and manager's private life satisfaction index at the company level (CLSI). The weight of 0,5 i.e. 50% is also used considering that balance represents establishing alignment between work and private life of all managers in the company:

$$CWLBSI = CJSI * 0,5 + CLSI * 0,5$$

Based on the presented Tables 1 and 2 with calculated manager's job satisfaction index and manager's private life satisfaction index at the individual level and at the company level, it is possible to determine manager's work/life balance satisfaction indices at the individual level (MWLBSI$_1$-MWLBSI$_5$) by weighting manager's job satisfaction index at the individual level (MJSI) and manager's private life satisfaction index at the individual level (MLSI) by 0,5 i.e. 50% each, for each individual manager (Table 3).

Table 3: Example of calculating manager's work/life balance satisfaction index at the individual level (MWLBSI)

MSI	M1	M2	M3	M4	M5
MJSI	MJSI$_1$ = 3,67	MJSI$_2$ = 4,33	MJSI$_3$ = 3,33	MJSI$_4$ = 4,67	MJSI$_5$ = 4
MLSI	MLSI$_1$ = 5	MLSI$_2$ = 3,33	MLSI$_3$ = 3,67	MLSI$_4$ = 4,33	MLSI$_5$ = 4
MWLBSI = MJSI * 0,5 + MLSI * 0,5	**MWLBSI$_1$** = 3,67 * 0,5 + 5 * 0,5 = 1,84 + 2,5 = **4,34**	**MWLBSI$_2$** = 4,33 * 0,5 + 3,33 * 0,5 = 2,16 + 1,66 = **3,82**	**MWLBSI$_3$** = 3,33 * 0,5 + 3,67 * 0,5 = 1,66 + 1,84 = **3,5**	**MWLBSI$_4$** = 4,67 * 0,5 + 4,33 * 0,5 = 2,34 + 2,16 = **4,5**	**MWLBSI$_5$** = 4 * 0,5 + 4 * 0,5 = 2 + 2 = **4**
M1 - M5 - manager 1 - manager 5					
MSI - manager's satisfaction indices at the individual level:					
MJSI - manager's job satisfaction index at the individual level					
MLSI - manager's private life satisfaction index at the individual level					
MWLBSI - manager's work/life balance satisfaction index at the individual level					

Source: Adapted from: Mladenović, M. (2022). Usklađenost posla i privatnog života kao determinanta produktivnosti menadžera i preduzeća u Republici Srbiji. Doktorska disertacija.

Based on the presented calculation in Table 3, it can be concluded that manager 4 has the highest work/life balance satisfaction index (MWLBSI$_4$ = 4,5), followed by manager 1 (MWLBSI$_1$ = 4,34), manager 5 (MWLBSI$_5$ = 4) and manager 2 (MWLBSI$_2$ = 3,82), while manager 3 has the lowest work/life balance satisfaction index (MWLBSI$_3$ = 3,5).

Based on the determined manager's satisfaction indices in Tables 1, 2 and 3, the ranking of managers according to the value of their job satisfaction index (MJSI), private

life satisfaction index (MLSI) and work/life balance satisfaction index (MWLBSI) at the individual level is presented in Table 4, starting from the highest to the lowest index value.

Table 4: Example of ranking managers by the value of their job satisfaction index (MJSI), private life satisfaction index (MLSI) and work/life balance satisfaction index (MWLBSI) at the individual level

RANK	MJSI	MLSI	MWLBSI
1.	**M4** ($MJSI_4 = 4,67$)	**M1** ($MLSI_1 = 5$)	**M4** ($MWLBSI_4 = 4,5$)
2.	**M2** ($MJSI_2 = 4,33$)	**M4** ($MLSI_4 = 4,33$)	**M1** ($MWLBSI_1 = 4,34$)
3.	**M5** ($MJSI_5 = 4$)	**M5** ($MLSI_5 = 4$)	**M5** ($MWLBSI_5 = 4$)
4.	**M1** ($MJSI_1 = 3,67$)	**M3** ($MLSI_3 = 3,67$)	**M2** ($MWLBSI_2 = 3,82$)
5.	**M3** ($MJSI_3 = 3,33$)	**M2** ($MLSI_2 = 3,33$)	**M3** ($MWLBSI_3 = 3,5$)
M1 - M5 - manager 1 - manager 5			
MJSI - manager's job satisfaction index at the individual level			
MLSI - manager's private life satisfaction index at the individual level			
MWLBSI - manager's work/life balance satisfaction index at the individual level			

Source: Adapted from: Mladenović, M. (2022). Usklađenost posla i privatnog života kao determinanta produktivnosti menadžera i preduzeća u Republici Srbiji. Doktorska disertacija.

By comparing the presented satisfaction indices by managers in Table 4, it can be observed that manager 4 has very high values of all indices, with slightly higher value of job satisfaction index ($MJSI_4 = 4,67$) compared to private life satisfaction index ($MLSI_4 = 4,33$). Manager 5 has very high both job satisfaction index ($MJSI_5 = 4$) and private life satisfaction index ($MLSI_5 = 4$). Manager 1 has a very high private life satisfaction index ($MLSI_1 = 5$) and a medium job satisfaction index ($MJSI_1 = 3,67$). In contrast, manager 2 has a very high job satisfaction index ($MJSI_2 = 4,33$) and a medium private life satisfaction index ($MLSI_2 = 3,33$). Finally, manager 3 has medium values of all indices, with slightly higher value of private life satisfaction index ($MLSI_3 = 3,67$) compared to job satisfaction index ($MJSI_3 = 3,33$).

It is also possible to calculate manager's work/life balance satisfaction index at the company level (CWLBSI) by weighting manager's job satisfaction index at the company level (CJSI) and manager's private life satisfaction index at the company level (CLSI) by 0,5 i.e. 50% each. Table 5 shows manager's satisfaction indices at the company level on the example of a hypothetical company which has a total of 5 managers.

Table 5: Example of calculating manager's work/life balance satisfaction index at the company level (CWLBSI)

CJSI	CJSI = **4**
CLSI	CLSI = **4,07**
CWLBSI = CJSI * 0,5 + CLSI * 0,5	CWLBSI = 4 * 0,5 + 4,07 * 0,5 = 2 + 2,04 = **4,04**
CJSI - manager's job satisfaction index at the company level	
CLSI - manager's private life satisfaction index at the company level	
CWLBSI - manager's work/life balance satisfaction index at the company level	

Source: Adapted from: Mladenović, M. (2022). Usklađenost posla i privatnog života kao determinanta produktivnosti menadžera i preduzeća u Republici Srbiji. Doktorska disertacija.

In the example presented in Table 5, all indices determined at the company level have very high values, with slightly higher value of manager's private life satisfaction index at the company level (CLSI = 4,07) compared to manager's job satisfaction index at the company level (CJSI = 4). Manager's work/life balance satisfaction index at the company level is also very high (CWLBSI = 4,04).

The above mentioned manager's satisfaction indices should be measured periodically, at least once a year, both at the individual level and at the company level. It can also be very significant to compare the values of these indices by years and by managers in order to determine which dimensions of work or private life have had an increase or decrease in satisfaction, so that eventual corrective actions can be taken. This comparison can be made by creating the previously presented Tables 1-5 and by comparing them by years.

Discussion of the effects of manager's work/life balance

Managers can implement various work/life balance practices and benefits, both privately and organized by their companies. Thereby, from the offered practices and benefits by the company, each individual manager should choose the ones that are most significant to them, depending on their current career position, living conditions, life circumstances, as well as personal values, needs, goals and priorities (Mladenović & Krstić, 2021c).

It is extremely important that managers' superiors work on increasing managers' awareness of the benefits of these practices, and on encouraging their practical implementation by managers both at home and at work by emphasizing their contribution to both personal development and professional progress of managers (Blair-Loy & Wharton, 2002). At the same time, it is also important to create such a work environment in the company that the manager feels free to ask superiors or colleagues for help in a certain work or private situation, where crucial is managers' perception of respect for their private obligations through congruence of their superiors who show in their behavior that they really understand managers' private obligations, representing a role model of behavior for managers (Allen, 2001).

In the application of managers' work/life balance practices and benefits inside and outside the company, there may be certain obstacles, such as lack of finances, time, motivation or prioritization of work/life balance by managers (Mladenović & Krstić, 2021a). On the

other hand, managers who achieve work/life balance can experience positive effects at work, such as better communication, a higher level of commitment, motivation and productivity, and lower level of stress, absenteeism and turnover (Haar & Roche, 2010), as well as positive effects in their private life, such as more time spent with family members, better physical and mental health, and a higher level of happiness, satisfaction and quality of life (Cinamon & Rich, 2010).

Conclusion

Stress at work is considered a disease of the 21st century, taking into account that circumstances in private life can also be very stressful, especially for managers. Research shows that adequate communication with superiors, colleagues and subordinates in the company can significantly increase manager's job satisfaction (Petković & Rapajić, 2021). Manager's private life satisfaction can be significantly contributed by setting boundaries with people and separating manager's work and leisure time by not answering work e-mails outside of working hours, but rather spending quality time with family members at home (Trenbeth & Drewe, 2002).

Concern for establishing work/life balance of managers and other employees can be considered an element of social responsibility of contemporary companies (Stojanović-Aleksić & Bošković, 2017). Therefore, companies can differentiate themselves from the competition by investing in improving knowledge, abilities, skills, motivation, commitment, well-being, and quality of life of their managers and other employees (Ansari, 2011). The paper presented certain subjective factors and company factors as determinants of manager's work/life balance, within which were also presented different work/life balance practices that managers can apply outside the company, as well as benefits that companies can offer their managers.

Research questions in the paper related to the definition of dimensions and the possibility of measuring manager's satisfaction are answered by creating the conceptual model of interdependence of manager's job satisfaction, private life satisfaction and work/life balance satisfaction. The presented model emphasizes the defined dimensions of manager's job satisfaction (characteristics of manager's job, organizational culture, communication and manager's support at work, and company practices for manager's work/life balance), as well as the defined dimensions of manager's private life satisfaction (manager's personal characteristics, manager's support at home, and private practices for manager's work/life balance). Managers can assess the mentioned satisfaction dimensions through a questionnaire by conducting empirical research, and based on managers' grades, manager's job satisfaction index and manager's private life satisfaction index can be calculated. The paper also presents the conceptualization and methodology of determining manager's work/life balance satisfaction index by weighting previously calculated manager's job satisfaction index and manager's private life satisfaction index (as dimensions of manager's work/life balance satisfaction).

Limitations of the paper are reflected in the information for determining manager's satisfaction indices, which is obtained through a questionnaire and therefore represents the grades of manager's satisfaction at the moment of completing the survey. These limitations can be overcome by repeating the research i.e. by re-completing the survey questionnaire by

the same managers in different time periods (e.g. by years) and comparing the values of the determined satisfaction indices. In this way, as well as by conducting the identical research and implementing the identical index methodology in different companies, research question in the paper related to the possibility of comparing the measured satisfaction by managers, by years and between companies is also answered.

Practical recommendations for managers and companies include measuring manager's satisfaction indices periodically, at least once a year, both at the individual level and at the company level. Moreover, it is extremely useful to compare the values of these satisfaction indices by managers and by years in order to determine in which dimensions of work or private life there has been a positive or negative change, so that corrective measures can be implemented if necessary. Finally, it can be very significant to measure and compare manager's work/life balance before and after using certain practices both at work and at home in order to determine and quantify their benefits, which could be the subject of future research.

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SIGNIFICANCE OF AGE AND GENDER DIVERSITY IN AUDITORS AND CLIENTS DECISIONS - CASE STUDY OF SERBIA

Abstract

Purpose: This paper highlights that the age and gender of the client board matters when deciding about the type of auditing company to do the audit and the type of opinion they get from the auditor. Design/Methodology: We took secondary data from audit reports issued to private and public corporations containing qualified, disclaimer, and adverse opinions and derived certain conclusions about the possible age and gender board memeber influence on those decisions. The research methodology was based on descriptive statistics and data correlation analysis. The sample consists of 62 companies' audit reports with qualified opinions. Findings: Board members in their golden age and women as board members are better negotiators than other age and gender groups in this context. Originality: When the board is dominated or has an older female, it will rather engage in contracts with the local audit companies. On the other hand, a board dominated by younger male members engaging with local audit companies, when a qualifying opinion is given. The results do not confirm the research questions because the age and gender of the board members have mixed effects when choosing the audit company and the decision to be made.

Keywords: auditor-client negotiation, age diversity, corporate governance, modified opinion

JEL classification: *M42, M14, M 41*

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ЗНАЧАЈ СТАРОСНЕ И РОДНЕ ПРИПАДНОСТИ У ДОНОШЕЊУ ОДЛУКА РЕВИЗОРА И КЛИЈЕНАТА-СТУДИЈА СЛУЧАЈА РЕПУБЛИКЕ СРБИЈЕ

Апстракт

Сврха: Овај рад наглашава идеју да су старост и род преговарача у одбору клијената битни када се одлучује о врсти ревизорске куће која ће обавити ревизију и врсти мишљења које они добијају од ревизора. *Методологија*: Коришћењем секундарних података ревизорских извештаја издатих корпорацијама чије су акције листиране на берзи и корпорацијама чије акције нису листиране на берзи, а који садрже квалификовано мишљење, уздржавање од мишљења и негативно мишљење, изведени су одређени закључци о томе да ли старости и род чланова одбора клијената утиче на избор ревизорске куће и добијено мишљење. Методогија се зансива на дескриптивној статистици и корелацији. Узорак се састоји од 62 квалификована мишељења. *Резултати*: Чланови одбора који се налазе у златном добу, без обзира на род, као и жене као чланице одбора су бољи преговарачи од других група у овом контексту. *Оригиналност:*. Различите старосне и родне групе заступљене у одборима клијената бирају различите ревизорске куће. Истраживање је показало да ако у одбору има старијих чланова, а посебно уколико старије жене доминирају у избору локалне компаније ревизори, док ако у одбору има млађих мушких чланова одбора или оних у средњим годинама опет је изабрана локална компанија када се клијент суочава са квалификованим мишљењем. Резултати не потврђују постављена истраживачка питања, односно године и родна структура делује у комбинованом ефекту, а не као појединачне варијабле.

Кључне речи: преговарање ревизор-клијент, старосна разноликост, корпоративно управљање, модификовано мишљење

Introduction

The audit-client negotiation and decision-making process consists of auditors on the one side and the client's board of directors or auditing committee on the other side. Companies whose shares are traded on the stock exchange and closely held corporations and their financial statements are all subject to auditing. That is common in all jurisdictions, including Serbia. Auditors should express their opinion on whether those financial statements comply with legal and accounting standards. Auditors' independence while issuing those opinions will not be jeopardized with the client-audit negotiation process as long as the ' 'auditor's ethical and professional standards are met.

When a company receives a positive opinion, also called an unqualified opinion, there is less need for negotiation between auditor and client. The positive opinion is given when auditor perception is based on audit methodology and evidence supporting the fact that no material misstatements are presented in the 'client's annual report and that financial statements and disclosures are in line with a set of accounting standards, mainly

International Financial Reporting Standards (IFRS).On the other side of the spectrum are companies whose opinions will be modified. A modified opinion ranges from qualified to the disclaimer and adverse, all of which could force a company to be delisted from the stock exchange or will signalize investors that a company is not an optimal investment alternative, e.g., investors should " sell" their shares. A modified opinion could be separated into three categories: qualified, disclaimer, and adverse. Qualified opinion, according to Pasiouras et al. (2007), is issued when there is either a limitation on the scope of the ' 'auditor's examination that results in insufficient evidence to express an unqualified opinion; the auditor disagrees with the treatment of the disclosure of a matter in the financial statements; financial statements in its entirety do not give a true and fair view of the matters on which the auditors are required to report or do not comply with relevant accounting or other requirements. Also, a qualified opinion is given when a company does not comply with the going concern principle, e.g., will go bankrupt or discontinue its operations. When a client company does not meet the going concern standards, a disclaimer opinion could be issued instead of qualified, but there is no precise guidance for auditors. Audit partners said that when facing issuing disclaimer opinions, they consider factors such as good and bad entities' news, internal control items, financial ratios, auditor perception of litigation risk, and auditor relationship with the client (LaSalle & Anandarajan, 1996). An adverse opinion is issued when there is a material misstatement in client financial statements or when financial statements are not prepared by accounting standards in effect in that jurisdiction. Based on all of the above mentioned, there is a certain space for negotiations between client and auditor in the context when a client expects to get qualified/adverse or disclaimer opinion. As auditor partners mentioned to LaSalle and Anandarajan (1996), litigation risk and the auditor's relationship with the client influence the negotiation process.

From the client's side, negotiations and decisions differ a lot.

In Serbia, as an emerging market, the role of the board of directors and its members in choosing an audit company and making negotiations is much more effective than the role of the audit committee. That is because Serbian financial markets are illiquid and shallow, and according to the Law on Corporations, not all corporations are required to have an audit committee. Only public companies have this obligation, while private or closely held corporations are not required to establish this committee (Article 409). The audit committee recommends the auditor to the board of directors while the board makes the decision (Article 441). It seems that the board's role is emphasized more than the audit committee, and the committee has a less formal role in the Serbian corporate environment. For the above-mentioned reasons, we took the board of directors members into the analysis of negotiations instead of audit committee members. As mentioned by PWC (2015), a corporation does not need to have an audit committee, and its function is regulated less formally but efficiently. The audit committee could be considered as a sub-board (PWC, 2015). That means that the main role in Serbian corporations lies with the board of directors, and the audit committee has a less visible role. Auditors discuss with the board members or audit committee many different topics such as the audit process, audit planning procedures, auditor position toward accounting practice of the company (accounting policies and procedures, disclosure practice, etc.), auditor

assurance about the financial statements, key auditing topics during the audit and challenges that auditor are exposed to during an audit, as well as internal control issues (PWC, 2015). Serbian corporations need to fulfill listing requirements if their shares will be trading at the Belgrade Stock Exchange (https://www.belex.rs/trzista_i_hartije/uslovi), and in those requirements, it is found that a corporation listed at Prime needs to submit a positive opinion (unqualified) while for corporation listed at Standard listing, unqualified and modified opinion is accepted (qualified and disclaimer). Disclaimer and qualified opinions are more common in Serbia than in developed countries. In developed countries, if a qualified opinion is issued to the company, it will be delisted, let alone a disclaimer and adverse. In Serbia, because companies are not frightened to be withdrawn from the stock exchange because of qualified and disclaimer opinions, negotiation between client and auditor is hidden behind. Only adverse opinion, if received, affects corporate delisting in Serbia. This opens much room for the negotiation process between clients and auditors.

Zhang et *al.* (2021) proposed a negotiation integrative model based on three negotiation components – task, dynamic variables of negotiators, and context placed in four dimensions - informational and computational, procedural, social, and strategic. The negotiation process that we emphasize in this paper consists of tasks in the form of discussing important accounting procedures and politics, while the dynamic variable is the gender and age of client board members, and the context is an emerging economy such as Serbia. We took into analysis incorporated businesses (closely held and public companies) that are recipients of audit reports and auditors (type of company and audit opinion issued). From the secondary data, we derived hidden audit-client negotiation trends.

Even though the age of board members is an observable board characteristic, audit negotiation is less observable and is rarely discussed by auditors in a free and open manner because it is a sensitive issue. If disclosed by the auditor, it could mean the independence is undermined. Scholars have rarely investigated the negotiation process between auditor and client for the reasons mentioned above. Gibbins *et al.* (2001) claim that the negotiation process has been influenced by two 'parties' capabilities, interpersonal relationships between auditor and client, and constraints of external conditions. Difficulties in issuing qualified audit opinions by the auditor are even more complex because of the two types of audit report misclassifications (Carey *et al.*, 2008).

They are known as Type II and Type I errors. Type II error is that a bankrupt company will not receive a qualified audit opinion regarding the going concern assumption, and Type I is to give a qualified opinion to a company that will survive the bankruptcy. In the first case, the auditor is stigmatized by the investment community, while in the second case, the auditor will be subject to a court proceeding by the client. It seems that much space for negotiation is opened when this information is taken into the spectrum of the audit-client negotiation process when a modified opinion is to be issued. For Gibbins *et al.* (2001), the negotiation process depends on the cost of negotiation, reporting deadlines, the size of the audit company, and the size of a client relative to the audit firm. Gibbins *et al*. (2001) applied a questionnaire design to address those issues and find primary data and links between them in negotiations. But, those data are influenced by auditor bias. That is why we take a secondary data analysis in this specific case.

Why would client board age and gender characteristics influence the negotiation process when the company is facing to receive modified opinions? In answering this

question, we need to consider that a client, when facing receiving a modified opinion, will pressure the auditor to issue a qualified opinion instead of an adverse or disclaimer. Characteristics of the ' 'client's age and gender in putting this pressure on the auditor during negotiations make a difference in the negotiation process and its outcome (opinion given). The boards of some companies receiving qualified opinions disagree strongly with auditors (Carcello & Neal, 2003). This supports our idea that the negotiation process happens in this specific type of environment where we conduct our research.

On the other spectrum, auditors could also have in mind that issuing less modified opinion is better for auditing business because the client cannot sue the auditor and the client will not terminate the relationship with the auditor, or the auditor will not be subject to auditor switch and lose the auditing fee from the client. Auditors lose their fees when they apply a more conservative methodology to assess the going concern principle in audit when issuing qualified opinions (Krishnan, 1994). So, we assume that auditors will also support the idea of negotiation and be subject to it reasonably.

In making those negotiations, we found different age groups and their traits very important in this research. The idea that different age groups negotiate differently is supported by research in specific settings, such as leisure spaces, but not in business negotiations (Pain *et al.*, 2000). In business negotiations, more gender issues are found important, as well as negotiation context, process, and outcomes (Agndal *et al.*, 2017). This idea that age is important for negotiations is based on the work of the following authors: Li *et al.*, 2020; Bleidorn & Schwaba, 2018; Damian *et al.*, 2019; and Kandler, 2015.

Li *et al.* (2020) found many consequences of age-diverse workplaces and workforces. Results of this study indicate that age diversity was positively associated with organizational performance through the mediation of increased human and social capital. An age-diverse workforce creates value through knowledge-based organizational resources. Damian *et al.* (2019) found that people change continuously throughout their lifespan, which appears to be most profound during adulthood. However, not everyone follows these normative trends. Life experience may influence personality changes throughout the lifespan. Bleidorn and Schwaba (2018) found that retirement influences change in older people. Kandler et al. (2015) found that although individual differences in personality traits were fairly stable due to genetic and environmental sources, individual changes were primarily due to environmental sources (beyond random error), indicating plasticity in old age. Age differences matter in negotiation in audit client relationships because older people could be better negotiators because of accumulated knowledge and more social and professional connections with auditors.

Based on all the above, the choice of the auditing company and conducting the audit-client negotiation process depends on the personality traits of client board members, and those traits differ between men and women and different age groups. As more women advance into upper-level positions in organizations, it is increasingly important to understand how gender impacts the behaviours, processes, and outcomes of negotiation (Stuhlmacher & Walters, 1999). There is a widespread belief that women are less effective negotiators than men. However, Neu *et al.* (1988) found no differences between male and female sellers. They supported this with the fact that sex differences in interaction styles may fade as people gain experience in the workplace. Gender differences in negotiation depend on the topic; men outperformed women in the

masculine version of our negotiation task, and the gender difference was eliminated in the feminine version of the task (Bear & Babcock, 2012). Walters *et al.* (1998) found that women are more competitive than men when competing against opponents who pursued a" "tit for tat" bargaining strategy.

There are twofold importance of this research.

It will help the *Serbian Chamber of Authorized Auditors* by highlighting gender and age as factors in the client-audit negotiation process. It will also help them protect audit companies and their interest from a client's non-ethical pressure in the negotiation process. Academicians, on the other hand, would benefit from extending the research of audit negotiation into the area of corporate governance and client board diversity, which is in line with Directive 2014/95/EU of the *European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU as regards disclosure of non-financial and diversity information by certain large undertakings and groups* demanding from companies to make board diversity information publicly available. Therefore, this manuscript is directed to the area of manuscripts promoting gender diversity on the board and in decision-making and negotiations.

The paper is structured as follows: a literature review is presented, followed by empirical research and results from the discussion. The last part of the paper is devoted to concluding remarks.

Theoretical foundations of the research

How the age and gender of the client board of directors influence the audit-client negotiation process could be explained by two theories: social capital and upper echelons theory.

Social capital theory can be defined as all the resources in possession of a person or group. Bourdieu and Wacquant define social capital as "the sum of the resources, actual or virtual, that accrue to an individual or a group by possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition." (Niu and Chen, 2016).

Niu and Chen (2016) argue that the quality of board performance could be improved if the social network closure can improve trust and collaboration within the board, while external contacts may benefit a company with more diverse sources of information. In this respect, gender and age diversity in corporate boards contribute to businesses with different social capital. Therefore, social capital empowers directors, and different kinds and strengths of social networks and social capital may offer different kinds of chemistry in board meetings, affecting the quality of corporate governance and decision-making (Niu & Chen, 2016).

Upper echelons theory (Bassyouny et al., 2020; Hambrick & Mason, 1984) states that the characteristics of their top managers predict strategic choices and firms' outcomes. Bassyouny et al. (2020) put their research in the environment in which they evaluate how upper-echelon characteristics influence the tone in the narrative disclosures of financial statements. They found that older female and financial expert CEOs display a less positive

tone, while audit committee and board independence are negatively associated with a positive narrative tone. Hambrick and Mason (1984) argue that theorists of the Carnegie School pointed out that complex decisions are largely the outcome of behavioural factors rather than a mechanical quest for economic optimization. Older individuals are more conscientious as they are more responsible than younger individuals, have more cautious decision-making strategies, are more risk-averse than younger individuals, and have more experience (Hambrick & Mason, 1984; Taylor, 1975). According to Taylor (1975), age influenced performance more than prior decision-making experience. Taylor (1975) found that young managers are more inclined to pursue risky strategies than older managers (in product innovation, diversification, and financial leverage). According to upper echelon theory, complex decisions result from the upper echelon's behavioural characteristics, namely the board of directors and managers. The more complex the decision is, the more behavioural factors influence it. Each decision-maker brings its own set of behavioural aspects to the decision-making process. Hence, as decision-makers age, they have a different set of knowledge, assumptions, and alternatives they put in it.

Demographic characteristics of board members and audit committee members are put in relationship with corporate disclosures, financial reporting variables, earning quality, audit report lag, stock prices, and audit fees (Mustafa et al., 2017; Komal et al., 2021; Hashim et al., 2019; Abed et al., 2020; Yeung & Lento, 2018; Felix et al., 2021).

Mustafa et al. (2017) report that demographic diversity (e.g., gender and age) and cognitive diversity (e.g., interlocking directorship and levels of education) of the board of 'directors' impact on ''the client's incentive and ability to demand high audit quality proxy by Big4 auditors. Authors find a positive relationship between directors within 36-55 and 46-55 years old and audit quality. Komal et al. (2021) study aims to examine how the age diversity of audit committee financial experts (ACFEs) influences the financial reporting quality of Chinese non-financial firms. The study shows that younger ACFEs mitigate earnings management better than older ACFEs. Hashim et al. (2019) found that Gender and Age diversity do not significantly impact earnings quality. Abed et al. (2020) results indicate strong empirical evidence that several non-executive directors, role duality, director age, board diversity, and institutional ownership influence management report lag. Yeung and Lento (2018) find that a stronger ownership structure and higher audit quality are associated with lower stock price crash risk, and the association is stronger since the IFRS and split-share reforms than before them. Felix et al. (2021) find that audit committee cultural diversity is associated with a lower likelihood of financial accounting restatements. More culturally diverse audit committees are more effective in restraining CEO accounting opportunism.

The relationship between age diversity and firm performance, borrowing cost, dividend policy, and earnings management was part of numerous studies as well (Ferrero-Ferrero et al., 2015; Waheed & Malik, 2019; Algatan, 2019; Knežević et al., 2021; Arenas-Torres et al., 2021; Marzuki et al., 2019).

Results regarding age diversity and its influence on entity results are quite mixed and raise inconclusive evidence. Kagzi and Guha (2018) found a positive linear relationship between the overall board demographic diversity index (board gender, age, tenure, and education) and firm performance. Arioglu (2021) suggests that board age diversity positively affects both company performance and risk but does not suggest that intra-group conflicts regarding work-related values are the underlying causes of this

positive effect. Jonson et al. (2020) found that the average age of board members is positively associated with firm performance. Mbonu and Amahalu (2021) showed that gender diversity, age diversity, and geographical diversity significantly positively affect Borrowing costs. Ali et al. (2021) illustrate that a higher diversity on the corporate board (in terms of age, gender, tenure, education, and expertise) positively influences firm efficiency, while Wang and Fang (2020) found that understanding the age diversity of the workforce is imperative to understand how organizations can maximize the benefits that can be derived from it. Despite the positive influence of age diversity, negative and insignificant influences are also found. Talavera et al. (2018) found a negative relationship between board age diversity and bank profitability. Emad Eldeen et al. (2021), in an empirical study made in the UK, indicate that age diversity hurts firms. Woschkowiak (2018) found the insignificant influence of age on financial performance.

In Serbia, age diversity is rarely taken into consideration. Whether the influence of age is considered important depends on the industry itself. Pavlović et al. (2018) found no influence of age on performance in the agriculture sector in Serbia.

Regarding gender differences in negotiations, the following studies are found: Hernandez-Arenaz and Iriberri, 2019; Mazei et al., 2015; Hong and van der Wijst, 2013; Andersen et al., 2018. Agndal et al. (2017), found that in real life, a large portion of negotiations takes place within the frame of established relationships, where negotiating is one form of interaction between the parties of the relationship. Relationships are also not static, i.e., they evolve as parties interact and get to know each other (Agndal, 2017). Carlsson and Karlsson (1970) stated that changing conditions would become more visible directly in the behaviour of young people in late cohorts and much less in the behaviour of earlier cohorts, that is, among middle-aged or older people. This is also in line with results obtained by Kagzi and Guha (2018), Woschkowiak (2018), and Arioglu (2021) that younger males are risk-takers.

Men are more likely to enter into negotiations; when negotiating, they obtain better deals than women (Hernandez-Arenaz & Iriberri, 2019). Mazei et al. (2015) found that men achieved better economic outcomes than women on average, but gender differences depend on the context. Power significantly reduces the differences in negotiation outcomes between men and women (Hong & van der Wijst, 2013). Women in matrilineal society earn more than men in negotiations (Andersen, 2018). More evidence supports the idea that women are less effective than men in negotiations. When negotiation is in question, Beattie et al. (2000) found that the audit committee reduces the level of negotiation and increases the level of discussion in a client-audit relationship. Negotiation issues align with earnings management instruments applied by the client companies, while compliance issues dominate discussions (Beattie et al., 2000).

Gender and age are heavily investigated as factors of organizational performance, financial accounting quality, and audit quality, but not as a negotiating factor. From the scarce literature review regarding audit-client negotiations presented, the following research questions are drawn:

RQ1: Are men more effective negotiators than women when clients expect to receive qualified, adverse, or disclaimer opinions in Serbian corporations?

RQ2: Are older board members more effective negotiators than younger board members when clients expect to receive qualified, adverse, or disclaimer opinions in Serbian corporations?

In explaining our research question, we would like to point out that our idea lies in the fact that client who faces difficulties in terms of fulfilling going concern assumption or having other financial difficulties will first make a choice of the auditing company, and then it will influence the audit-client negotiations. The type of audit company doing an audit in this specific case will be of paramount importance. We assume that clients, when facing qualified or adverse and disclaimer opinions, will choose a domestic company to do the audit because of its well-established network with domestic auditors and its size. These are smaller audit companies that do not have rigorous procedures and audit methodology, so a better negotiation outcome for the client is possible (less negative opinion from the pool of modified opinion). After the auditing company is chosen, the client starts negotiations with the auditor to get a better opinion and not be delisted.

Methodology

The sample consists of audit reports issued in 2019 for Serbian corporations (listed and closely held), and 62 received qualified opinions, disclaimers of opinions, or adverse opinions from the audit companies. Auditor reports and types of opinion, as well as the audit company, were part of the database and can be found at the website *https://data.mendeley.com/datasets/x3z4zx8vwr/1 and checkpoint.rs.* The other data regarding the age and gender of board members are hand-collected from respective companies' websites and directors' reports.

The size of the audit company is defined as a local firm (coded with 1), international (coded 2), and Big4 (coded 3). Audit opinion issued is also a categorical variable coded with -3 when an adverse opinion is issued, -2 for a disclaimer opinion, and -1 for a qualified opinion. Female and male board member ages are collected from their year of birth. Board age structure is decomposed into various groups: group 1 -age up to 45, group 2- 45-55, group 3- 55-65, group 4- 65-75, and group 5- more than 75 years old.

Results

Empirical results are presented for the sample of a total of 62 companies receiving qualified, adverse, and disclaimer opinions together with the board diversity characteristics and president of the board age and gender. Results are divided into descriptive statistics and Pearson correlation analysis for all those variables.

To describe the variables in question, we presented client board characteristics in terms of total board 'members' gender, age, board president, age, gender, and CEO age.

Table I shows the gender and age statistics of client board members. According to Table I, the mean age of the female board 'members' is 53.2817 years old, with a minimum age of 37 and a maximum of 71. In the male group, the average age is 58.7965, with a minimum of 39.33 and a maximum of 73. 75. In companies receiving qualified, adverse, and disclaimer opinions, female board members are much younger than their male board counterparts.

Table 1 *Client board age and gender statistics* **-** *Descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
Female_board_members_age	29	37.00	71.00	53.2817	8.07986
Male_board_members_age	62	39.33	73.75	58.7965	7.61078
Board_age_average	62	39.33	71.20	58.0593	6.78339
Valid N (listwise)	29				

Source: Authors' calculation

All company board presidents with qualified/adverse/disclaimer opinions are male. Table II indicates that the average age of the board president is 59.47, which is higher than the average age of the male board members (58.7965). No female presidents existed in the companies in question. Male presidents are appointed as very young (min. 36) and very old (max. 82).

Table 2 *Client President of the board age statistics* **-** *descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
President_of_board_age	62	36	82	59.47	10.003
Valid N (listwise)	62				

Source: Authors' calculation

Table III shows that the CEO's age average is 53.66, which is younger than the board's age average (58.0593). It seems that younger individuals are appointed CEOs in this group of companies, and they are younger than the president of the board average (59.47).

Table 3 *CEO age statistics - descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
CEO_of_company_age	62	31	82	53.66	10.784
Valid N (listwise)	62				

Source: Authors' calculation

The set of Tables IV and V consists of a description of auditor type and audit opinion. It shows that in 71% of cases, local audit companies are engaged to do the audit, and they have issued 4.8% of adverse opinions, 33.9% of disclaimers and 61.3% of qualified opinions. International companies are engaged in 25.8% of cases, and Big 4 in 3.2%

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Table 4 *Auditor Type*

	Frequency	**Percent**	**Cumulative Percent**
Local	44	71	71.0
International	16	25	96.8
Big 4	2	3.2	100.0
Total	62	100	

Source: Authors' calculation

Table 4 *Auditor Type*

	Frequency	**Percent**	**Cumulative Percent**
Adverse opinion	3	4.8	4.8
Disclaimer of opinion	21	33.9	38.7
Qualified opinion	36	61.3	100.0
Total	62	100.0	

If female board members are younger (see Table VI), they tend to engage more international auditors (group 1, mean 1.75), while if female board members are older (group 4), they tend to engage local auditors (mean 1.00).

Table 6 *Female board members are divided into five age groups and auditor-type statistics* (group 1: up to 45; 2: (45,55]; 3: (55,65]; 4: (65,75]: 5: >75 years)

Group Female	**Group characteristics**	**Auditor type**
1	**N**	**4**
	Mean	1.75
	St.Deviation	.957
2	**N**	**12**
	Mean	1.08
	St.Deviation	.289
3	**N**	**12**
	Mean	1.50
	St.Deviation	.522
4	**N**	**1**
	Mean	1.00
	St.Deviation	

Total	N	29
	Mean	1.34
	St.Deviation	.553

Source: Authors' calculation

In the next section, Table VII, explains male board member groups and engaging the auditors. If male board members are younger (group 1), they engage local companies to do the audit (mean 1.0), while if they are older (group 4 mean is 1.53), they engage more international auditors.

Table 7 *Male board members divided into five age groups and Auditor type statistics*
(group   1: up to 45; 2: (45,55]; 3: (55,65]; 4: (65,75]: 5: >75 years)

Group Male	Group characteristics	Auditor type
1	N	2
	Mean	1.00
	St.Deviation	.000
2	N	18
	Mean	1.22
	St.Deviation	.428
3	N	27
	Mean	1.30
	St.Deviation	.609
4	N	15
	Mean	1.53
	St.Deviation	.516
Total	N	62
	Mean	1.32
	St.Deviation	.536

Source: Authors' calculation

Table VIII explains female board members and their type of opinion. Female board members are categorized into five age groups. The table shows that boards have only one female in the old age group (65-75), while 12 belong to the group 45-65 and 12 in the group 55-65, and we name those groups "golden age." Women in their golden age get more qualified opinions (14 total for both groups) instead of disclaimers (10 total for both groups), and no adverse given. Older women (75 and older) negotiate for a qualified opinion. So, golden age and older females are good negotiators. The very young female group (less than 45 years old) gets qualified and disclaimers opinion, and we could conclude that they negotiate the same as the golden age female group.

Table 8 *Female members were categorized into age groups and correlated*
with the type of opinion

GROUP Female		Age	Audit Opinion	
≤45	N	4	Qualified = –1	2
	AS	40.00	Disclaimer of Opinion = –2	2
	SD	2.9439	Adverse Opinion = –3	0
(45,55]	N	12	Qualified = –1	7
	AS	49.76	Disclaimer of Opinion = –2	5
	SD	2.5868	Adverse Opinion = –3	0
(55,65]	N	12	Qualified = –1	7
	AS	59.75	Disclaimer of Opinion = –2	5
	SD	2.3012	Adverse Opinion = –3	0
(65,75]	N	1	Qualified = –1	1
	AS	71	Disclaimer of Opinion = –2	0
	SD	/	Adverse Opinion = –3	0
≥75	N	0	Qualified = –1	0
	AS	/	Disclaimer of Opinion = –2	0
	SD	/	Adverse Opinion = –3	0
Total	N	29	Qualified = –1	17
	AS	53.28	Disclaimer of Opinion = –2	12
	SD	8.0799	Adverse Opinion = –3	0

Source: Authors' calculation

Table IX presents data for male age subgroups and types of opinions. As male members are younger, they get qualified opinions. If they belong to the golden age groups (45-65) with the highest level of knowledge and expertise, they get more qualified opinions than the disclaimer opinion by the auditor (11:8 in the group 45-55 and 18:8 in the group 55-65). But in older groups (45-55 and 55-65), males also got two adverse opinions. That differs greatly from the female group, where no adverse effects are given.

Table 9 *Male members were categorized into age groups and correlated*
with the type of opinion

GROUP Male		Age	Audit Opinion	
≤45	N	2	Qualified = –1	2
	AS	41.165	Disclaimer of Opinion = –2	0
	SD	2.5951	Adverse Opinion = –3	0
(45,55]	N	18	Qualified = –1	11
	AS	50.585	Disclaimer of Opinion = –2	6
	SD	3.0254	Adverse Opinion = –3	1
(55,65]	N	27	Qualified = –1	18
	AS	60.63	Disclaimer of Opinion = –2	8
	SD	2.6814	Adverse Opinion = –3	1

(65,75]	N	15	Qualified = –1		7
	AS	67.71	Disclaimer of Opinion = –2		7
	SD	2.1967	Adverse Opinion = –3		1
≥75	N	0	Qualified = –1		0
	AS	/	Disclaimer of Opinion = –2		0
	SD	/	Adverse Opinion = –3		0
Total	N	62	Qualified = –1		38
	AS	58.79	Disclaimer of Opinion = –2		21
	SD	7.6108	Adverse Opinion = –3		3

Source: Authors' calculation

Correlation in Table X shows that as client female board members are older, they are more inclined to get qualified opinions (Corr.0.169). In contrast, in the male group, the same correlation is negative (Corr.-0.139), meaning that older male members are more adverse, and a disclaimer opinion is given on average. However, the results are not statistically significant because of large age variations in the board.

Table 10 Correlation with audit opinion by gender

		group_Female	**group_Male**
Audit_Opinion	Pearson Correlation	0.169	-0.139
	Sig. (2-tailed)	0.382	0.283
	N	29	62

Source: Authors' calculation

Results discussion

To discuss the results and our research questions imposed above, we can conclude that the age and gender of the board matter when choosing an audit company and in audit-client negotiations when the client is facing qualified, disclaimer, or adverse opinion in the audit report.

Our results will be discussed from two negotiation angles: the age and gender of board members in determining the type of audit company through the negotiation process between board members and age/gender in negotiating regarding the opinion received in the client-audit negotiation process.

That is why our paper is based on the idea that if the client board consists of older board members, they will be at a point where financial security and career security are important in their lives. They will avoid engagement in audit contracts considered to be of lower quality, therefore inclining to international or Big 4 audit firms. Our results do not support the research questions. On the contrary, they show that gender and age cannot be observed as isolated variables. Their effects are quite mixed.

We assumed that younger board members would take riskier audit contracts and be more inclined to local firms when negotiating. That is especially true when a company is about to receive adverse, disclaimer, or qualified opinions. Because international and Big 4 companies have strengthened policies and procedures, we assume older members should be inclined towards more international companies. However, this situation is complicated if we take gender into the analysis. Our results confirmed that in a group of companies in Serbia receiving adverse/disclaimer/qualified opinions, younger *male* board members engage local companies to do the audit, while if they are older, they engage more international auditors. On the other hand, younger female board members tend to engage international auditors. If they are older, they sign the contract with local auditors.

This is in line with the widespread opinion that older top executives tend to be more conservative and risk-averse, and they are expected to have more ethical behaviour as a consequence (Pavlović et al., 2019). This is in line with Larimer et al. (2007), who pointed out that males dominate social hierarchies and males are oriented toward status. This could be the explanation for why older males tend to sign contracts with more prestigious audit companies such as Big 4 auditors. They tend to engage international auditors to ensure high-quality audits in this difficult situation.

Well, women of different ages do not follow these patterns in Serbia. It seems that women in top positions tend to be more prone to risk compared with older males in the same position, and they sign more contracts with the local companies, which is against the assumed older members' behavior. Younger female board members, on the other hand, tend to sign contracts with international auditors. Being risk-averse as younger women could be explained in this specific sample of Serbian companies because there are no female boards, so in the mixed environment (male-female board), younger women follow older men's behavior and decisions. This is the case even in politics, where female support groups enhance the authority of male decision-makers while they remain excluded from the source of power (Cohen, 1979). This is in line with Zinkhan and Karande (1991), who found that women are more conservative than men when they perceive the situation as ambiguous and, hence, have to make decisions under uncertainty.

When answering the second research question about the negotiations before issuing an opinion by the auditor, results also show that when older women are included in the client board, the auditor gives fewer disclaimers and adverse opinions. In this specific case, when an opinion is received, it is confirmed that older or golden-age women are as good negotiators as men. The economic outcome in the form of auditor opinion supports this fact. This is opposed to the results of Hernandez-Arenaz and Iriberri (2019) and Mazei (2015). In these studies, men are better negotiators and achieve better economic outcomes.

As mentioned before, having an adverse opinion means a delisting situation for the company, or it gets the attention (Susanto, 2018). This applies to Serbia as well. So, the company will try to avoid this if possible and force negotiation towards a better outcome: qualified and disclaimer. However, the auditor will focus on this outcome as well (Cipriano et al., 2017). We strongly suggest that when negotiation happens, the auditor and client would have the same outcome in mind - to prepare a report with a disclaimer or qualified option and avoid the adverse option, if possible. As Gibbins

et al. (2001) pointed out in this context, negotiation will be placed on the side where accounting standards for preparing a report are unclear, ambiguous, and incomplete, making alternative treatments for specific client interests difficult for the auditor to oppose, which is why it led to multiple rounds of negotiations. Johnson and Powell (1994) stated that the problem-solving ability of women significantly improved when the problems set had a '"'feminine' rather than '"'masculine' content. Negotiation in this context could be seen as having feminine content where judgment, ability to present the idea, and pursuing the auditor to give qualified/disclaimer instead of adverse is of primary importance. Our results support both that negotiations before making decisions happen and that women are as good as men in that process. Unfortunately, there are no direct scientific results in Serbia about negotiations because the subject is very sensitive for auditors and clients, and that is why we have taken this indirect approach in research, using only secondary data and revealing possible relationships.

Conclusion

Gibbins et al. (2001) pointed out that the auditor-client accounting negotiation model must be contextualized. Our research chooses the context in which modified opinion is given to Serbian corporations. Research focuses on the area of client perceptions as a key factor affecting negotiations with auditors, as Gibbins et al. (2001) suggested.

Besides presenting the evidence of negotiation context not influenced by the auditor bias (relying on auditor memory about the events and auditor-specific situation chosen), our objective is to provide researchers with a possible line of audit-client negotiation derived from external secondary data analysis. We derived the indirect evidence that the gender and age of the client board matters in this specific case of negotiation. Our results confirm that age and gender of the client board are factors of interest in the audit-client negotiation process before issuing the opinion and that older females are as good negotiators as men.

These research results are valuable for the academic community, auditors, and their professional bodies. From the academic angle, this paper extends the shortage of literature on audit-client negotiations, putting it in the context of the age demography of board members, the choice of audit company, and the audit opinion issued. From the angle of professional associations of auditors, this paper can serve as a proxy that can reveal possible ethical dilemmas that auditors may face when the client board is composed of different member age groups. The research shed light on the emerging country where different contextual factors shape audit-client negotiations. Considering that corporate boards in Serbia heavily choose local audit companies, the role of the Serbian Chamber of Authorized Auditors in governing the audit process and establishing audit policies should not be underestimated.

Limitations of the research are based on the country where the research has been conducted because it is an emerging market, so the results cannot be transposed to other countries. Also, future researchers could extend the results using interviewing techniques to go deeply into the motives of audit-client negotiations. Based on these preliminary statements found in our research, future researchers could derive an empirical study or

model and give attention to specific factors: the number of individuals participating, the range of reports, negotiation accounting topics, and the strategy adopted.

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ECONOMIC ASPECTS OF FRUIT PRODUCTION IN SERBIA ON THE EXAMPLE OF APPLE ORCHARDS[4]

Abstract

Apple is one of the most important fruits in the world and in Europe. In the Republic of Serbia, it is grown on 27,034 ha of agricultural land and, judging by this criterion, is in second place, right behind plum. The paper analyzes the production of Golden Delicious apple cultivar on a family farm in the region of Šumadija and Western Serbia, on an area of 1 ha, with a 3.2 x 0.8 m planting distance. The apple crop is in full bloom, with all agrotechnical measures necessary for proper cultivation applied in production, including irrigation. The recorded production value is from the yield of 45.0 t/ha of apples. Total variable costs amount to RSD 687,445.00/ha or EUR 5,864.83/ha. Ratio of total costs and income from apple production in 2022 gives a contribution margin of RSD 1,337,555.00/ ha or €11,411.15/ha, i.e. RSD 29.72/kg or €0.25/kg, at apple selling price of 45 din/kg, i.e. 0.38 €/kg. The efficiency of apple production is 2.95. Results point to the conclusion that apple production can be profitable and that it is a moderately risky production line.

Key words: *apple, production, export/import, prices, costs, contribution margin/ profit, cost-effectiveness of production*

JEL classification: *Q14, Q13, R3.*

ЕКОНОМСКИ АСПЕКТИ ВОЋАРСКЕ ПРОИЗВОДЊЕ У СРБИЈИ НА ПРИМЕРУ ЗАСАДА ЈАБУКЕ

Сажетак

Јабука је једно од најважнијих воћа у свету и Европи. У Републици Србији се гаји на 27.034 ха пољопривредног земљишта и по овом критеријуму је на другом месту, одмах иза шљиве. У раду је анализирана производња сорте јабуке Голден Делишес на породичном газдинству у региону Шумадије и Западне Србије, на површини од 1 ha, са растојањем садње 3,2 x 0,8 m. Род јабуке је у пуном цвату,

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а у производњи се примењују све агротехничке мере неопходне за правилан узгој, укључујући и наводњавање. Евидентирана производна вредност је од приноса од 45,0 t/ha јабуке. Укупни варијабилни трошкови износе 687.445,00 динара/ha или 5.864,83 €//ha. Однос укупних трошкова и прихода од производње јабуке у 2022. години даје маржу доприноса од 1.337.555,00 RSD/ha или 11.411,15€/ха, односно 29,72 RSD/кг или 0,25€/кг, по продајној цени јабуке од 45 дин/кг, односно 0,38 €/ha. /kg. Ефикасност производње јабуке је 2,95. Резултати упућују на закључак да производња јабука може бити исплатива и да је реч о умерено ризичној производној линији.

*   **Кључне речи:** јабука, производња, извоз/увоз, цене, трошкови, маржа доприноса/профит, исплативост производње*

***JEL classification:** Q14, Q13, R3.*

Introduction

The share of fruit production in the total value of agricultural production in the Republic of Serbia is 11% (Strategy of Agriculture and Rural Development of the Republic of Serbia 2014-2024), which ranks fruit growing as one of the most important branches of agriculture. Fruit growing is the most productive branch of agriculture, which greatly intensifies entire agricultural production (Kljajić et al., 2013). Fruit production, especially for fresh consumption, is very labor-intensive and very profitable (Mamuza and Vaško, 2013). Fruit production has a direct impact, through primary production and agro-industry, on the overall economic development, especially in rural areas, and then on the development of the country's economy as a whole. The indisputable importance of fruit growing implies the following: the irreplaceability of fruit in the nutrition of the population; fruit as a raw material in food industry and other related activities; export of fresh or unprocessed fruit to the foreign market; employment during the year, especially during the harvest season; high profit per unit area; use of natural resources; fight against soil erosion; microclimate change, beekeeping and others (Božić, 2005, Milić et al., 2005a).

In different natural conditions (microclimate and soil characteristics), the possibilities for growing different types of fruit and their varieties also differ. According to fruit representation, in Serbia, stone fruits (peach, apricot, plum, cherry, sour cherry, morello cherry) are in first place, followed by apples (apples, pears, quinces, medlars, sorb apples), berries (raspberries, blackberries, strawberries, currants, gooseberry, blueberry, mulberry), while nuts (walnut, hazelnut, almond, chestnut) are represented to the smallest extent. Apple is one of the most common types of fruit in our country (Lukić and Milošević, 2016). According to the Statistical Office of the Republic of Serbia, Statistical Yearbook 2022, plums are grown on the largest areas (on 72,569 ha of agricultural land), followed by apples (on 27,034 ha of agricultural land).

Apple is one of the most important fruits in the world and in Europe. It can be said that apple production shows the development of the entire fruit production in any country (Subić et al, 2017; Kljajić et al., 2014). Apple originates from Asia Minor and Central Asia, to be transferred to Europe in the Middle Ages, then from Europe to North and South America

and then to Australia. It was used as food since prehistoric times. It belongs to the apple type of fruit, along with pear, quince, medlar and sorb apples, and is a very durable stone fruit that can be preserved and used throughout the year (Milić et al., 2005a, Milić et al., 2014). Apple belongs to the *Rosacea* family. According to Magazin et al., domestic apple (*Malus domestica Borkh*) is the most economically important species out of 33 species within the Malus genus. It was created as a hybrid of wild apple (M. Sieversii (Lodeb.) Roem.) and European and Asian apple varieties (Brown, 2012).

Owing to its properties, apple is a very healthy fruit that works effectively in the body's fight against viruses and bacteria, improves immunity, controls diabetes, is a good antioxidant, and generally protects the body from various chronic diseases.

Apple contains from 15% to 19% of dry matter, with 9-16% of fruit mass made up of sugars (mainly glucose and fructose), from 0.2% to 1.8% of organic acids, and 0.4% of mineral matter. Of minerals, there is the most potassium (Purić, 2021). Other biologically significant substances apple contains are vitamin C, carotene, anthocyanins, tannins, amino acids, etc. (Mratinić, 2016).

The success of apple growing depends on environmental conditions in which it is grown. Consequently, apple and its production must be adapted to environmental conditions, i.e. the climatic, soil and hydrological conditions of the area where it is grown. Regarding apple cultivars, the leading cultivar in Serbia is still Idared (Milošević et al., 2007). The share of this cultivar in the production structure is 20-25%. It is an American cultivar obtained as a cross between two apple varieties, "Jonathan" and "Wagener" in 1942. It is grown all over the world. It came to Serbia in 1961 (Rakićević et al., 2008). In the last few years, varieties that belong to the group of fall apple varieties with an earlier ripening period have gained primacy. In this way, the apple harvest period is extended. There is a pronounced trend of introducing other varieties depending on market demand. The share of Granny Smith and Golden Delicious and Jonagold is growing. Red Delicious, Gloucester, Mutsu, Gala and others are present to a lesser extent. Club varieties appear in production as well: Pink Lady, Modi, Fuji Kiku (Lukić and Milošević, 2017; (http://www.minpolj.gov.rs/dokumenti/izvestaji-sa-trzista/).

Material and method

The aim of the paper work is to demonstrate the economic justification of apple cultivation on the example of the production of one registered agricultural farm in the Šumadija Region and Western Serbia.

The paper work is designed so that it is divided into two parts. In the first part of the paper work, an analysis of the representation of areas under apple plantations and the total and average yield of apples in the Republic of Serbia, and at the level of the Šumadija Region and Western Serbia, was presented. The analysis covered the period from 2013 to 2022. Relevant changes in the area under apple plantations and total production were analyzed using the average annual rate of change. In addition, the export of apples from Serbia is shown, as well as the import of apples to the Republic of Serbia. These values are expressed in thousands USD. At the end of the first part, the average annual purchase prices of apples in the Republic of Serbia for the period 2013-2022 are shown year.

In the second part of the paper work, the calculation of the apple production of the agricultural farm per 1 ha of surface area, the sensitivity analysis in apple production – the

change in the coverage margin in relation to the drop in yield and the critical value in apple production was done.

For the purposes of the research, data from statistical publications of the Statistical Office of the Republic of Serbia (RZS) for the period 2013-2022 were used. Trade statistics for international business development (TRADEMAP), market reports of the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia, as well as available scientific and professional literature dealing with this topic. The results of previous research on the mentioned issue were also used. Data are presented tabularly and graphically.

Research results and discussion

The average area under apple plantations in the last ten-year period (2013-2022) amounts to 26,298 ha. Table 1 shows that the largest area under apple plantations in the Republic of Serbia is in 2022 (27,253 ha), and the least in 2013 (23,989 ha). The largest production is in 2013 in the value of 516,411 t and the lowest in 2017 in the value of 378,644 t. The average value of total production in the period 2013-2022 is 471,251 t. The highest achieved yield is in 2013 (21.5 t/ha), and the lowest in 2017 (15.1 t/ha), while the average value for the observed ten-year research period is 17.9 t/ha.

Table 1. Average value of area, total production and apple yield in the Republic of Serbia for the period 2013-2022

Research period	Harvested area, ha /fertile area, ha	Li	Total production (t)	Li	Yield, t/ha	Li
2013	23.989	–	516.411	–	21,5	–
2014	24.441	101,88	403.936	78,22	16,5	76,74
2015	24.703	101,07	431.759	106,89	17,5	106,06
2016	24.818	100,47	400.473	92,75	16,1	92,00
2017	25.134	101,27	378.644	94,55	15,1	93,79
2018	25.917	103,12	460.404	121,59	17,8	117,88
2019	26.089	100,66	499.578	108,51	19,1	107,30
2020	26.360	101,04	489.426	97,97	18,6	97,38
2021	27.034	102,56	513.238	104,87	19,0	102,15
2022	27.253	100,81	486.215	94,73	17,8	93,68
Average	26.298		471.251		17,9	
Average annual rate of change (%)	1,43		-0,67		-2,08	

Source: https://data.stat.gov.rs/Home/Result/130102?languageCode=sr-yrl&displayM ode=table&guid=68df3487-0c0a-45ff-a139-2b51f0cfa503

In the observed period from 2013-2022, the total area under apple plantations increased by 1.43% on average per year. Total apple production decreased by 0.67% on average per year, while the total yield decreased by 2.08% on average per year.

The largest apple production is in the Šumadija Region and Western Serbia. For the period 2013-2022, the average area under apple plantations was 10,117 ha, with an average total production of 139,885 t and an average yield of 13.3 t/ha. This region accounts for 52.9% of the total apple production in the Republic of Serbia (Table 2).

Table 2. Average value of area, total production and apple yield in the Republic of Serbia for the period 2013-2022

Territory	Harvested area, ha/fertile area (ha)	Total production (t)	Yield (t/ha)
Republic of Serbia (total)	26.298	471.251	17,9
Serbia-North	10.017	221.911	22,1
Belgrade region	2.423	31.366	12,9
Vojvodina region	7.594	190.545	25,1
Serbia-South	16.281	249.340	15,4
Region of Šumadija and Western Serbia	10.117	139.885	13,3
Region of Southern and Eastern Serbia	6.164	109.455	17,7

Source: Author's calculation based on data from https://data.stat.gov.rs/Home/Result/130102?languageCode=sr-yrl&displayMode=table&guid=68df3487-0c0a-45ff-a139-2b51f0cfa503

Modern apple production makes it possible to achieve high and stable yields. It implies the application of all necessary agrotechnical measures, as well as irrigation, hail and frost protection, etc. This reduces the risk of production to the smallest possible extent (Potkonjak i et al., 2011). When modern agricultural techniques are applied in production, it is possible to achieve high yields, satisfying fruit quality and high financial results (Čejvanović et al., 2005). According to Đurović et al. (2023), the fruits of trees under intense irrigation are characterized by uniformity, are larger, better colored, ripen earlier, have a more harmonious taste, and so on. However, the application of irrigation requires moderation, so when irrigating with a non-optimal amount of water, the fruit loses its quality, i.e. fruits become tasteless and their storage length is shorter.

The structure of apple producers has changed significantly in recent years. Ten years ago, the main apple producers in Serbia were individual farmers who grew apples in the traditional way, on 2-5-ha plots. Now they are commercial farms that gradually increase the plantation area to about 10 ha. In addition, these farms apply modern and contemporary technology in apple production. The number of companies with 25-250-ha apple plantations is also growing. They apply the most modern growing technology and, therefore, get high yield (50-70 t/ha).

The export of apples is the basis for increasing the total domestic fruit production, because apples are in second place among all types of fruit in terms of production. To increase exports, the growth of domestic apple production is necessary, on the one hand, as well as the change and adaptation of apple varieties to market requirements, on the other hand (Vlahović et al., 2015).

Tables 3 and 4 show the export and import of apples from and to Serbia for the period 2013-2022 to all world countries as well as to the EU countries.

Table 3. Export of fresh apples from the Republic of Serbia for the period 2013-2022.

Year	All countries		EU countries (28)	
	Quantity (t)	Value in thousand USD	Quantity (t)	Value in thousand USD
2013	115.938,2	53.024,8	38.835,7	8.836,3
2014	135.982,2	81.307,5	4.880,2	1.708,8
2015	187.365,6	104.096,7	22.985,0	4.843,3
2016	232.203,8	127.074,6	23.303,1	4.150,9
2017	197.581,8	124.667,5	23.034,9	7.513,6
2018	144.747,0	101.414,5	11.775,5	4.579,1
2019	217.000,2	118.517,4	38.238,6	8.608,4
2020	173.098,4	125.400,7	21.715,6	6.733,4
2021	179.639,9	127.390,3	19.194,2	7.657,4
2022	148.077,4	107.674,7	8.842,6	4.035,8
Average	177.294,7	109.917,9	23.102,8	5.866,7

Source: https://data.stat.gov.rs/ Last update: 22 February 2023

For the research ten-year period, the largest export of 232,203.8 t was in 2016, worth 127,074.6 thousand USD, while the smallest apple export was in 2013 (115,938.2 t), worth 53,024.8 thousand USD. This data refers to the export of apples to all world countries. The situation is similar when it comes to apple export to EU countries (28). In contrast to exports, apple import into our country is insignificant. According to Trade Statistics for International Business Development, in 2022, apples were mostly exported from the Republic of Serbia to North Macedonia, the Netherlands, Russia, Germany, Italy... (Chart 1).

Chart 1. Prospects for market diversification for a product exported by Serbia in 2022. Product: 0808 Apples, pears and quinces, fresh
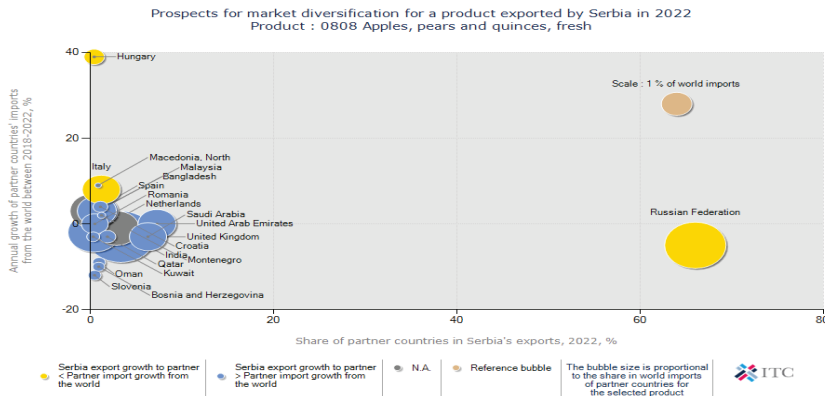
Source:https://www.trademap.org/Country_SelProductCountry_Graph.aspx?nvpm=%7c88%7c%7c%7c%7c0808%7c%7c%7c4%7c1%7c1%7c2%7c1%7c1%7c2%7c1%7c%7c2

Regarding apple imports, it was 40,749 t on average with a value of 12,678 USD. Of that, 59.8% was imported from the EU countries.

Table 4. Import of fresh apples to the Republic of Serbia for the period 2013-2022

Year	All countries		EU countries (28)	
	Quantity (t)	Value in thousand USD	Quantity (t)	Value in thousand USD
2013	28.753,2	10.429,0	5.622,9	4.276,3
2014	24.543,8	8.352,8	12.313,0	5.387,7
2015	58.223,1	17.258,1	32.260,4	12.381,8
2016	75.570,0	23.101,1	63.038,7	21.014,1
2017	66.439,7	20.637,0	56.032,3	18.061,7
2018	35.992,7	12.741,0	22.151,8	10.782,4
2019	33.209,9	8.518,7	24.105,7	7.422,8
2020	26.565,4	11.208,6	12.839,2	8.392,4
2021	20.713,1	6.714,5	8.988,9	4.920,5
2022	37.483,3	7.822,0	6.274,3	3.509,6
Average	40.749,4	12.678,3	24.362,7	9.750,8

Source: https://data.stat.gov.rs/ Last update: 22 February 2023
The average purchase price of apples, obtained from the values for the analyzed period (Chart 2), is 45.33 dinars/kg.

Chart 2. Average annual purchase prices of apples in the Republic of Serbia for the period 2013-2022.
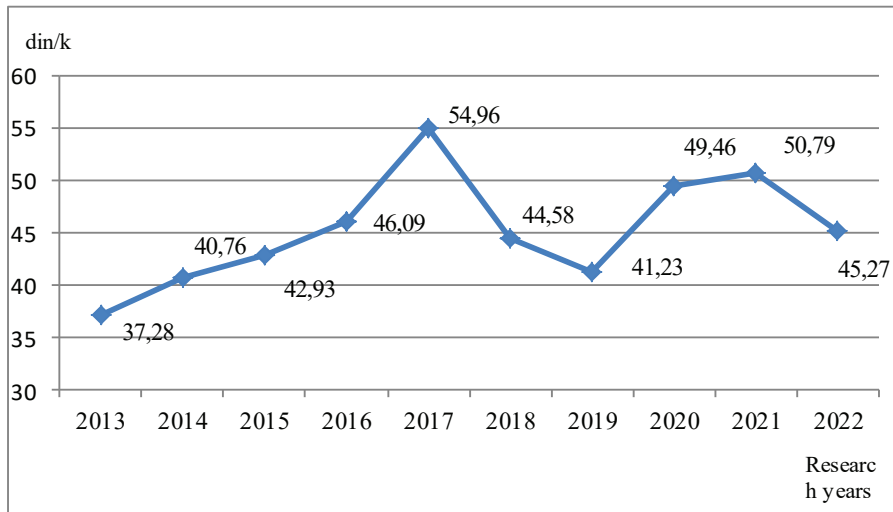
Source: https://data.stat.gov.rs/Home/Result/0302010302?languageCode=sr-Cyrl&displayMode=table&guid=1c4f54bc-4373-4ac4-a8b9-6349cd8a6f97, Last update: 27th June 2023.

Fruit market is free and there are no guaranteed purchase prices. The price of apples, as well as other agricultural products, is defined according to "supply and demand" market principle.

Economic results of apple production on a family farm

When marketing apples (as well as other fruit and other agricultural products) on the domestic and foreign markets, quality and continuity in delivery are necessary, so such market requirements impose the need for economically profitable and environmentally acceptable production (Jeločnik et al., 2011.; Maksimović et al., 2015;).

Table 2 shows the analytical calculation of apple production on an individual farm in the region of Šumadija and Western Serbia. The farm produces apples on a 5-ha-production area. It sells apples to well-known customers on the farm and on local green markets. It applies all agrotechnical measures in production, including irrigation. Without irrigation in apple production, the financial result after harvest would be somewhat uncertain. Therefore, irrigation in apple orchards is a mandatory measure for production safety and good financial result. A drip irrigation system has been installed in the garden. Costs related to system operation refer to energy costs for pump operation, water costs and maintenance of the irrigation system parts. All the necessary materials for plant care are purchased at the local market.

Table 2. Calculation of apple production of an agricultural farm on 1-ha area with a planting distance of 3.5 x 0.8 m (2022 in RSD/EUR/ha)

Element	Quantity	Unit of measure	Price (RSD/ UM)	Total value (RSD)	Total value (EUR)*
I INCOME					
Apple production (kg)	45.000	kg	45,0	2.025.000,00	17.275,99
Total income				2.025.000,00	17.275,99
II EXPENSES					
1. *Cost of material*					
1.1. Seedlings for replacement	25	piece	175,0	4.375,00	37,32
1.2. Binder	12	kg	410	4.920,00	41,97
1.3. Mineral fertilizer				32.500,00	277,27
1.4. Stable manure				28.500,00	243,14
1.5. Pesticides				94.700,00	807,92
1.6. Packaging (wooden crates)	1.900	piece	75	142.500,00	1.215,72
1.7. Irrigation				23.250,00	198,35
1.8. Other cost of material				19.500,00	166,36
Total				350.245,00	2.988,06
2. *Costs of depreciation and use of machinery*					

2.1.	Transportation and spreading of mineral fertilizers	1	ha	4.250,0	4.250,00	36,26
2.2.	Transport and spreading of manure	1	ha	6.500,0	6.500,00	55,45
2.3.	Treatment with protection agents	12	ha	5.350,0	5.350,00	45,64
2.4.	Inter-row processing and grass cutting	2	ha	7.850,0	7.850,00	66,97
2.5.	Transport	15	tour	1.050,0	15.750,00	134,37
	Total				39.700,00	338,69
3.	*Labour costs*					
	3.1. Pruning	400	hour	350	140.000,00	1.194,39
	3.2. Harvesting and packaging	450	hour	350	157.500,00	1.343,69
	Total				297.500,00	2.538,08
Total expenses					687.445,00	5.864,83
III Contribution margin (I–II)					1.337.555,00	11.411,15

Source: Author's research conducted in 2022
*1 EUR =117,2147 RSD (average NBS exchange rate on 1 October 2022)

Total costs, market value of production and profit were obtained based on data on costs in the production process and yield. Costing includes total costs, where costs of material are calculated based on market prices. 95% of the produced apples belong to the first class, and only 5% are in the second class, so when selling and buying a single apple price of RSD 45.0/kg is applied.

In the structure of variable costs, costs of material have the largest share (50.95%). Within the cost of materials, packaging costs have the largest share (40.69%). Packaging includes wooden crates with a capacity of 25 kg. In addition to these costs, the costs for the procurement and application of pesticides (27.04%) have a significant share in the total costs of materials (Table 3).

Within the costs of depreciation and use of machinery, the costs are approximately equally distributed between the transportation and spreading of mineral fertilizers and manure, treatment with protection agents, inter-row processing and transport. The share of these costs in total costs is only 5.77%.

Table 3. Cost structure in apple production expressed in RSD and in %

Type of costs	Value (RSD)	Share (%)
Costs of material	350.245,00	50,95
Costs of depreciation and use of machinery	39.700,00	5,77
Labour costs	297.500,00	43,28
Total costs	687.445,00	100,0

Source: Author's calculation based on research conducted in 2022

Within the labor costs in apple production, pruning costs account for 47.06%, and apple harvesting and packaging costs for 52.94% of total labor costs.

The total variable costs in apple production on the family farm included in this research amount to RSD 687,445.00/ha or EUR 5,864.83/ha. When translated into a value per kg, this cost amounts to RSD 15.08/ha or 0.13€/kg, which, compared to the apple selling price, is a significantly lower value and represents an exceptional benefit for apple producers. By comparing the total costs and realized income in apple production in 2022, we get a contribution margin of RSD 1,337,555.00/ha or 11,411.15€/ha, i.e. RSD 29.72/kg or 0.25€/kg, at the selling price of apples of 45 din/kg, i.e. 0.38 €/kg. The efficiency of apple production is 2.95.

Every investment in production brings a certain degree of risk due to unforeseen circumstances during the production itself and crop life, so evaluating the efficiency of future crops under risk and uncertainty is very important. The goal is to meet producers' expectations under potentially changing production conditions (Maksimović et al., 2015.; Jeločnik et al., 2021).

The analysis of sensitivity of contribution margin to a fall in yield or a fall in the selling price of apples is given in Table 4, which shows that the value of apple production and the price of apples on the market can fall by over 60%, while the farm still has a positive contribution margin in its production.

Table 4. Sensitivity analysis in apple production – change in contribution margin in relation to yield decline.

Fall in yield or fall in selling price of apples (%)	Contribution margin (RSD)
10,00	1.135.055,00
20,00	932.555,00
30,00	730.055,00
40,00	527.555,00
50,00	325.055,00
60,00	122.555,00
70,00	Negative

Source: Author's calculation based on data in Table 2.

Table 5 shows the critical values in apple production where contribution margin equals zero. The critical price of apples is 15.28 dinars/kg, the critical yield is 15,276.56 kg, and the critical variable costs are 2,025,000.00 dinars.

Table 5. Critical values in apple production, expressed in kg/ha, RSD

Description	RSD (kg/ha)
Expected yield (OP)	45.000,00
Expected (average) price (OC)	45,00
Subsidies (S)	0,00
Variable costs (VT)	687.445,00

Critical price: KC = (VT - S) / OP	15,28
Critical yield: KP = (VT - S) / OC	15.276,56
Critical variable costs: KVT = (OP x OC) + S	2.025.000,00

Source: Author's calculation based on research conducted in 2022.

The results obtained based on the analysis of apple production on the family farm lead to the conclusion that apple production is a profitable production line. This implies respect for the apple requirements as a fruit species in terms of its soil, water and climate needs, and the application of all necessary measures for its care and protection in production.

Conclusion

The results obtained during the analysis of apple production point to the following conclusion:

- Total variable costs amount to 687.445,00 RSD/ha or 5.864,83 EUR/ha;
- Cost of materials have the largest share in the structure of variable costs, first of all the costs of packaging when harvesting and packing apples, and then the costs of purchasing pesticides for the care and protection of plantations;
- Production achieved a positive contribution margin of RSD 1,337,555.00/ha or 11,411.15€/ha, to cover production costs and get a positive financial result;
- Critical production values at which the contribution margin equals zero have the following values: critical apple price is RSD 15.28/kg, critical yield is around 45.0 t/ha and critical variable costs are RSD 2,025,000.00/ha;
- The value of apple production and the market price of apples can fall by over 60%, while the farm still has a positive margin in its production;
- The efficiency of apple production is 2.95.

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TESTING THE MONETARY TRILEMMA THEORY ON THE EXAMPLE OF SERBIA[2]

Abstract

Monetary trilemma (MT) is an economic concept based on the idea that a country cannot concurrently have exchange rate stability, free capital flows and monetary independence, which is why it has to choose two of these three available options. The purpose of this article is to determine the validity of the MT hypothesis in Serbia, in the period from 2006 to 2022. After constructing the MT measures, the article approaches to multiple linear regression with the aim of establishing the binding relations among these variables. Serbia has a stable exchange rate policy and extensive capital flow controls, as well as monetary independence that could be much greater. Serbia appears to have voluntarily given up its monetary autonomy in favour of its exchange rate stability and financial closure. The originality of this article stems from the novel approach to this issues, being informative for domestic policy makers in their further policy considerations.

Key words: monetary trilemma, exchange rate stability, financial openness, monetary independence, Serbia, linear regression.

JEL classification: *E12, E42, E52, E62, O24*

ТЕСТИРАЊЕ ТЕОРИЈЕ МОНЕТАРНЕ ТРИЛЕМЕ НА ПРИМЕРУ СРБИЈЕ

Апстракт

Монетарна трилема (МТ) је економски концепт који се заснива на идеји о томе да земља не може истовремено да има стабилност девизног курса, слободу токова капитала и монетарну независност, због чега мора да изабере две од ове три расположиве опције. Сврха овог чланка је да утврди валидност хипотезе о деловању МТ у Србији, у периоду од 2006. до 2022. године. Након конструкције мера МТ, у чланку се спроводи вишеструка линеарна регресија са циљем утврђивања природе везе између ових варијабли. Србија се карактерише стабилном политиком девизног курса и обимним мерама контроле токова

капитала, као и монетарном независношћу која би могла да буде далеко већа. Наиме, чини се да се Србија добровољно одрекла своје монетарне аутономије у корист стабилности свог девизног курса и финансијске затворености. Оригиналност овог чланка простиче из потпуно новог приступа овим питањима, из чега и произилази његов значај за креаторе домаће монетарне политике у њиховим даљим разматрањима.

__Кључне речи:__ монетарна трилема, стабилност девизног курса, финансијска отвореност, монетарна независност, Србија, линеарна регерсија.

Introduction

The Monetary trilemma is a term in economic theory that indicates that a country has three equal options at its disposal when conducting its monetary and economic policy. These three goals of economic policy include: a) exchange rate stability, b) freedom of cross-border capital flows, i.e. financial integration, and c) independent monetary policy. Although the trilemma indicates that the country is faced with three possible policy choices, these options are mutually conflicting and exclusive because they cannot be all realized at the same time. Therefore, the trilemma suggests that a country can in a given time pursue and choose between any two of the three offered monetary policy objectives. The Monetary trilemma, or the so-called *Impossible trinity*, has its foundation in the Mundell-Fleming trilemma model, which indicates inherent instability during the simultaneous application of all three available policy options within the framework of the country's monetary policy (Tica, Globan & Arčabić, 2019, p. 63). In this way, the vertices of an imaginary triangle, as illustrated in Figure 1, can also represent these available and mutually exclusive economic and monetary policy options.

Figure 1: Policy choices in the Monetary trilemma issue
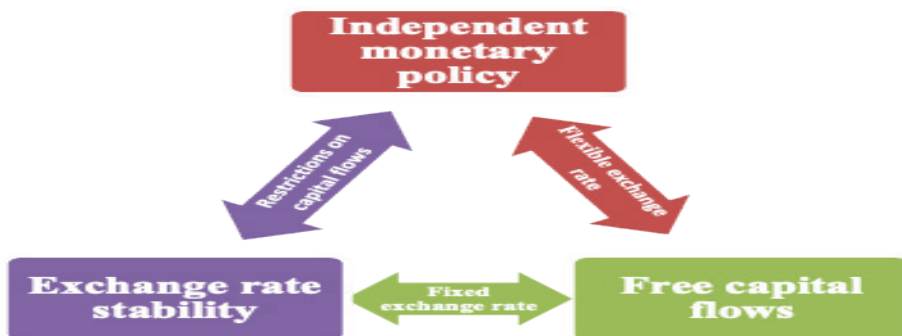
Source: Rieber (2017)

Thus, the Mundell-Fleming trilemma framework suggests that in a regime of free capital flows and a fixed exchange rate, the central bank cannot have monetary autonomy, nor it can contribute to the internal stabilization goals of its economic policy.

For example, when a country pursues a policy of fixed exchange rate and financial openness, its interest rate must follow the interest rate of the base country, in which case it gives up its monetary autonomy. Conversely, if a country does not peg its interest rate to the interest rate of the base country and has a liberal capital account, it breaks the peg, thus achieving its monetary independence, but it may at the same time deter investors from further investments, thus generating domestic currency depreciation. Another implication of the Mundell-Fleming trilemma is that in the case of closed capital flows or a flexible exchange rate, a country should be able to achieve its domestic economic and monetary policy objectives. In this way, and according to the postulates of the Monetary trilemma model, a flexible exchange rate compared to a fixed exchange rate gives the economy a certain amount of agility and freedom, whenever it has a need for an inflow of fresh capital (Carmi, 2020, p. 14).

In the context of this article, monetary policy independence is perceived as the ability of the central bank to set independently its interest rates from the movement of the interest rate in the base country (Aizenman, Chinn & Ito, 2012, pp. 6-7), as well as a capability of realization of the defined objectives of its monetary policy. At the same time, the choice of exchange rate regime represents a fundamental macroeconomic issue, especially in small open economies that need fresh capital inflows. This article is dedicated to testing the hypothesis about the Monetary trilemma functioning in the Republic of Serbia (RS), as a good example of small open economy, in the period from 2006 to 2022 for which there are available data. Thus, the time horizon under investigation includes the beginning of the 21st century when Serbia, after its period of international isolation from the 1990s, opened up and began its extensive economic reforms. However, this period has broader implications as it includes stages of large capital inflows and substantial appreciation of its real exchange rate (Petrović & Gligorić, 2010, pp. 23-24), especially in the wake of and after the global financial crisis of 2008, but also the recent global health *Covid-19* and Ukrainian crisis.

The next section of the article provides a brief literature overview on the *Impossible trinity* of macroeconomic policies, while the third one explains the construction of the Monetary trilemma measures used in this analysis. The fourth section discusses the obtained results, while the last section concludes the article, with a hint of the general characteristics and problems of the current monetary policy framework in Serbia. The scientific contribution of this article is reflected in its novelty, as well as in the fact that, at least according to the author's knowledge, no one has investigated the issue of Monetary trilemma in Serbia.

Theoretical Backgrounds

Up to this point, many authors have researched and addressed the issue of the Monetary trilemma and its feasibility in practice. As already indicated, the Monetary trilemma theory is often attributed to Robert Mundell and Marcus Fleming, who, in the middle of the last century, completely separately described the relationships among the stability of the exchange rate, the freedom of cross-border capital flows, and the autonomy of monetary policy. However, Maurice Obstfeld and Alan M. Taylor, who presented the modern Monetary trilemma model in their epoch-making article from 1997, laid its deeper foundations. Obstfeld and Taylor

(1997) studied the impact of global capital market integration on the trend of international capital mobility in the period from the 19th to the end of the 20th century, with an extensive discussion of capital movement controls and the achievement of domestic policy goals under conditions of changing monetary regimes. They were the first who introduced the notion of the macroeconomic policy trilemma, which forces policy makers to make trade-offs among these mutually conflicting economic policy goals. The goal of capital mobility prevailed in the circumstances of broad policy support for conducting a monetary policy subordinated to the exchange rate, as well as in the conditions of a monetary regime put in the service of fulfilling domestic policy goals, at the expense of exchange rate stability (Obstfeld & Taylor, 1997, p. 1).

In their somewhat later article, Obstfeld, Shambaugh and Taylor (2004, p. 75) conclude that even in the disordered period between World War I and World War II, economic policy was burdened with a choice among a fixed exchange rate policy, open capital markets, and independent monetary policy. Latter, Obstfeld, Shambaugh and Taylor (2008, pp. 1-9) broadened the scope of their analysis and examined the role of rapid growth in international reserves in the contemporary era of globalized capital markets. They concluded that the share of domestic financial obligations (M_2) in GDP, financial openness, the possibility of accessing foreign currency, and the exchange rate regime are among the main factors of holding foreign exchange reserves. All these factors are very important, while they multiply and mutually compound each other in their impact on the level of international reserves of a given country. Here again, the role of the Monetary trilemma comes to the fore, but in a somewhat different context. From this aspect, the demand for central bank reserves in its role as lender of last resort (LLR) is growing in all those economies where there is a risk of capital flight. The role of holding international foreign exchange reserves goes even further, indicating that they represent a key instrument for managing domestic financial instability, as well as a key tool for defending the exchange rate in conditions of increasingly strong financial globalization. In addition to affecting terms of exchange and improving the trade balance, foreign exchange reserves protect the domestic banking sector and credit markets, and thus prevent the depreciation of the national currency.

Among others, the authors Helen Rey and Joshua Aizenman further expanded the scope of this analysis, pointing out its complexity in the conditions of contemporary global capital flows. Aizenman, Chinn and Ito (2013, pp. 447-458) introduced entirely new measures for measuring key aspects of the Monetary trilemma (metrics of exchange rate flexibility, monetary independence, and capital account openness), also considering the role of significant accumulation of international reserves that has taken place since the beginning of the 21st century. The authors, by testing the linearity of the *binding* Monetary trilemma model, provided substantial empirical evidence of the existence of an *Impossible trinity* of the three aforementioned macroeconomic policy objectives. In their more recent paper, Aizenman, Chinn and Ito (2022, pp. 24-27) also introduce international reserves as a fourth variable, turning the trilemma of essential macroeconomic policies into a kind of *Monetary quadrilemma*. They point out that economic policy makers change its goals and configurations with the aim of stabilizing economic and financial conditions or minimizing vulnerability. In a financially highly globalized world, in addition to these three mutually exclusive standard goals, the holding of international reserves also plays an important role since they serve as a tool to ensure liquidity. The authors finally conclude that, in general, developing countries increased their foreign exchange reserves after the Asian Financial

Crisis (AFC), which especially applies to those ones that were exposed to higher terms of trade (TOT) shocks and higher rates of economic decline. Their findings indicate that holding international reserves is a good incentive to insure against some future financial crisis.

Finally, Helen Rey (2015) recently challenged the existence of the Monetary policy trilemma, pointing out that regardless of whether a country implements a fixed or flexible exchange rate regime, there is only a *Monetary dilemma* that refers to the choice between free cross-border capital flows and independent monetary policy. Rey emphasizes that in the conditions of the global capital flows financial cycle, asset prices and credit expansion, countries with greater capital inflows become more sensitive to its components. At the same time, the global financial cycle is not adapted to the economic specificities of the given country, leading to a possible excessive growth of the volume of loans and to the asset bubble bursting, and therefore to potential financial crises. Since in circumstances of capital mobility the global financial cycle constraints domestic monetary policies, the trilemma turns into a dilemma suggesting that monetary autonomy is possible only in the presence of imposed controls on the capital account. Rey (2013) concludes that, in addition to implementing capital control measures, the issue of monetary dilemma and financial instability can probably be solved by directly targeting the source of the problem, i.e. of excessive leverage and abundant credit expansion.

Construction of the Monetary Trilemma Metrics

The purpose of this article is to determine the validity of the hypothesis of Monetary trilemma in the case of Serbia, in the period from 2006 to 2022 for which there are available data. The methodology for calculating the indicators of the Monetary trilemma is taken from the article by Aizenman et al. (2013, pp. 448-449). In doing so, the data used are derived from the IMF's International Financial Statistics database and the IMF's relevant Annual Reports on Exchange Arrangements and Exchange Restrictions (AREAER). As already mentioned, monetary independence is treated as a deviation of the domestic interest rate from the interest rate of the base country (Cevik & Zhu, 2019, p. 6). For this purpose, the Index of the extent of monetary independence (MI) was used, which is calculated based on the annual correlations between monthly money market rates in Serbia and the Eurozone as the currency area to which Serbia has unofficially pegged its currency. In addition, the European Union (EU) is Serbia's largest trading partner, while the euro is often used as the currency of denomination. Thus, the MI index is calculated based on the following formula:

$$MI_t = 1 - \frac{corr(i_i, i_j) + 1}{2} \quad (1)$$

where i_i indicates the domestic money market rate, while i_j indicates the Eurozone money market rate. The MI index ranges from 0 to 1. While its lower values suggest monetary policy dependence, higher values of this indicator imply greater monetary autonomy levels.

The stability of the exchange rate is calculated by the Index of exchange rate stability (ERS) in the form of the annual standard deviations of the dinar monthly exchange rates against the euro in the observed period, based on the following mathematical expression:

$$ERS_t = \frac{0.01}{0.01 + stdev(\Delta(\log(exch\_rate)))} \quad (2)$$

The ERS index also has a range from 0 to 1, where higher values of this index indicate a more stable trend of the dinar exchange rate against the euro. This variable was further coded in such a way that if the monthly rate of the exchange rate change stayed within its bounds of ±0.33%, the exchange rate was treated as fixed and assigned a value of 1. On the other hand, if its monthly rate of change went out of its bounds of ±0.33%, the exchange rate of the Serbian dinar was perceived as flexible and was assigned a code of 0. Furthermore, if the exchange rate of the dinar during 11 of the 12 months of a given calendar year had a percentage change of 0, it was considered fixed exchange rate for that observed year (code 1).

Following the approach of Aizenman et al. (2013, pp. 448-449) and Mody & Murshid (2005, pp. 254-255), the Index of financial openness, i.e. financial integration (KAOPEN index) was compiled based on data on imposed control measures on current and capital transactions from the IMF aforementioned AREAER documents for all observed years. The indicators that contributed to the construction of the KAOPEN index included the following variables: a) a variable indicating the presence of dual and/or multiple exchange rates (k_{1t}), b) a variable indicating restrictions imposed on current account transactions (k_{2t}), c) a variable indicating the restrictions imposed on capital account transactions (k_{3t}), and d) a variable indicating the surrender of export proceeds and/or the earnings repatriation requirements (k_{4t}). For this purpose, binary dummy variables were created based on the tabular presentation of restrictions on external accounts from the AREAER reports, with the note that their values were reversed to emphasize the effects of financial openness (code 1). On the other hand, the complete absence of financial integration was given the code 0. When it comes to the third variable (k_{3t}), the paper covered all 13 categories of restrictions on the capital account, which mainly refer to the controls of the short-term and long-term capital market functioning, commercial and financial loans, granting guarantees, direct investments, personal capital and real estate transactions, as well as to the control of the credit institutions and institutional investors operations.

Research Results and Discussions

Figure 2 clearly shows that in the observed time frame from 2006 to 2022, periods of monetary autonomy and absence of monetary independence alternated, with pronounced periods of monetary dependence, especially in the aftermath of the global financial crisis of 2008, during the *Covid-19* crisis and at the beginning of 2022 when the Ukrainian war began. The average value of the MI index in the observed period was 0.4637, indicating more the absence than the presence of monetary independence. At the same time, Serbia achieved its greatest monetary independence, measured by the deviation of the money market rate from the Eurozone money market rate, near the beginning of the observed period in 2007 (MI index = 0.9549). On the other hand, the country had the lowest monetary autonomy in 2015, when its MI index was only 0.0337. The average value of the MI index of Serbia was MI index = 0.4637, pointing to a moderately strong monetary dependence of the country in the observed period (Table 1).

Figure 2: The MI index trend by years
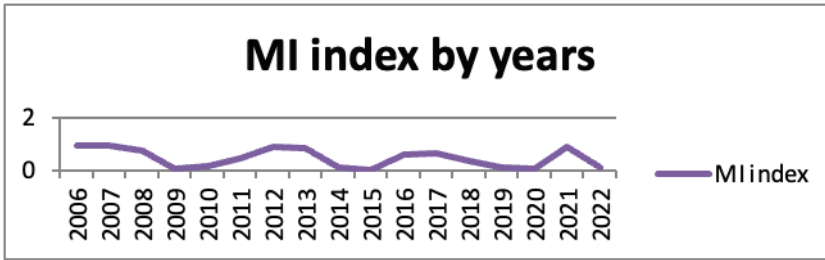
Source: Author's figure

Table 1: Summary descriptive statistics of all Monetary trilemma variables in the period from 2006 to 2022

Variables	Mean	Median	Maximum	Minimum	Standard deviation
MI index	0.4637	0.4408	0.9549	0.0337	0.3651
ERS index	0.4829	0.0349	1.0000	0.0199	0.5026
KAOPEN$_t$ index	0.1124	0.1500	0.1500	0.0000	0.0452

Source: Author's calculations

In Figure 3, after a period of marked flexibility of the exchange rate (the code 0) and some fluctuations, a long-term growth trend of the ERS index can be observed, suggesting an increase in the stability of the dinar exchange rate in the observed period. The average value of the ERS index was 0.4829, also suggesting moderate stability of the dinar exchange rate against the euro (Table 1). At the same time, Serbia had the highest stability of its exchange rate, measured by the annual deviation of the monthly exchange rate of the dinar against the euro, in 2014 and in the period from 2016 to 2022, when the ERS index had a value of 1. On the other hand, the country experienced the highest recorded instability of its exchange rate in 2007, 2008 and 2010, immediately after the outbreak of the global financial crisis from 2008 (ERS index = 0.0199).

Figure 3: The ERS index trend by years
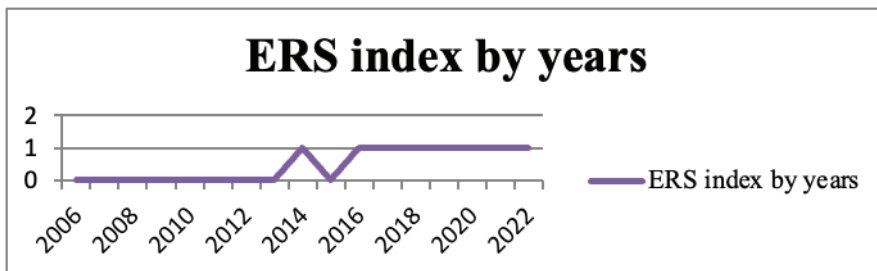
Source: Author's figure

For the purpose of clarification and construction of the $KAOPEN_t$ index, Principal component analysis (PCA) was applied to all four variables included in this indicator. The goal of applying the PCA method was also to determine the variable that made the greatest contribution to explaining the variance of the data. In this way, the Financial openness index ($KAOPEN_t$) of the Serbian economy was reduced to the first standardized principle component of the variables k_{1t}, k_{2t}, k_{3t} and k_{4t} in time t. Given the fact that there was no change in the variables k_{1t}, k_{2t} and k_{4t} in the observed period, it was not even possible to implement their standardization and normalization, which is why the PCA method was applied to the variables on the level. Despite this, the first eigenvector of the constructed $KAOPEN_t$ index amounted to $(k_1, k_2, k_3, k_4) = (0.00, 0.00, 1.00, 0.00)$, indicating that the variability of this indicator was largely determined by the third variable k_{3t} – restrictions imposed on capital account transactions.

The trend of the Serbian $KAOPEN_t$ index in the observed period indicates considerable financial closure and the extensive presence of measures to control cross-border capital flows (Figure 4). The average value of the $KAOPEN_t$ index was 0.1124 (Table 1), suggesting that throughout the observed period there were abundant capital flow control measures. At the same time, in 2007, the highest intensity of financial closure was recorded ($KAOPEN_t = 0$), while in the period from 2014 to 2022, the financial openness of the Serbian economy was slightly higher ($KAOPEN_t = 0.15$).

Figure 4: The KAOPEN$_t$ index trend by years
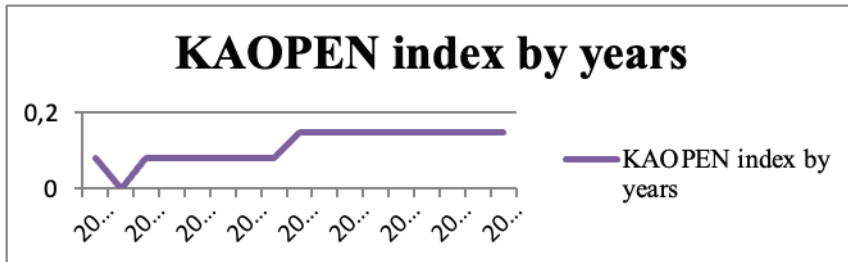
Source: Author's figure

After applying the Augmented Dickey-Fuller (ADF) unit root test and determining the stationarity of all considered variables, in its next step, the article approached to testing the validity of the hypothesis about the existence of the Monetary trilemma in Serbia. In other words, at this point, the article focused on the examination of the mutually *binding* relationship among these variables in the context of the Monetary trilemma, that is, on the consideration of the question whether Serbia was faced with trade-offs based on an *Impossible trinity*. For this purpose, a specific functional form of the relationship among these three macroeconomic policy goals could be conceptualized, being expressed in a linear mathematical form. If it were the case, the linear expression of the trilemma would imply that the weighted sum of all three variables generates a constant number, in which case the growth of one of them would cause the fall of weighted sum of the other two variables. Therefore, following the approach of Aizenman et al. (2012, p. 18) and with the aim of testing the validity of the Monetary trilemma hypothesis in Serbia, the article uses the following linear

functional form (Equation 3) that equates the weighted sum of observed variables with a constant, i.e. in this case with the number 1:

$$aMI_t + bERS_t + cKAOPEN_t + \varepsilon_t = 1 \quad (3)$$

where a, b and c are the coefficients of the considered macroeconomic variables, while ε_t is the error term.

However, from the conducted regression analysis, and in accordance with the approach of Aizenman et al. (2012; 2013, & 2022), it follows that the Monetary trilemma hypothesis is not valid in the case of Serbia since very small values of the tests' validity parameters were obtained. More precisely, very small values of the adjusted coefficient of determination were obtained both in the case of simple ERS index calculation based on the Formula (2) above (Adjusted R-squared = 13.66%) and also in the case of the Coded ERS index calculation corrected for coding effects (Adjusted R-squared = 17.29%). These findings indicate that there is still no linear relationship between the observed variables. In addition, neither the values, nor the obtained probabilities of the F-statistics gave the expected results (Table 2). Serbia, especially in recent times, is characterized by a policy of stable exchange rate and controlled capital flows, but also by moderate monetary autonomy, which, at least according to the postulates of the Monetary trilemma theory, could be much greater.

Table 2: Results of the performed linear regression

Variables	Model A – ERS index				Model B – Coded ERS index			
	Coeff.	Std. error	t-Statistic	Prob.	Coeff.	Std. error	t-Statistic	Prob.
ERS	0.1604	0.8079	0.1985	0.8455	0.2282	0.2820	0.8094	0.4318
KAOPEN_t	-4.6240	3.7677	-1.2273	0.2400	-6.0315	3.1342	-1.9244	0.0749
C	0.8678*	0.3116	2.7849	0.0146	1.0311*	0.2670	3.8615	0.0017
R-squared	0.2445				0.2763			
Adjusted R-sqared	0.1366				0.1729			
F-statistic	2.2658				2.6722			
Prob. (F-statsitic)	0.1404				0.1040			

*Note: * indicate significance at the level of α = 0.05*
Source: Author's calculations

Subsequent *post hoc* tests indicated the normality of the distribution of the residuals (Jarque-Bera = 0.9460, p = 0.6231 > 0.05), the absence of serial correlation in the residuals of the estimated regression model (Breusch-Godfrey Serial Correlation LM test: F-statsitic = 1.2183, Prob.(F(2,12)) = 0.3298 > 0.05) and the absence of heteroskedasticity (Breusch-Pagan-Godfrey heteroskedasticity test: F-statistic = 0.1197, Prob.(F(2,14)) = 0.8881 > 0.05). All these findings suggested that it is a valid and well-fitted model.

With these findings, the article did not fit with the research results of Aizenman et al. (2012; 2013, & 2022) and Obstfeld et al. (2004; 2008, & 2015) and only partially fitted in the findings of Rey (2013, & 2015), since in the regime of its stable exchange

rate, Serbia can still choose between the regime of financial openness and monetary independence. However, it seems that the country has simultaneously chosen its financial closure and low independence of its monetary policy. The objective limitation of this study is reflected in the relatively short time series given the availability of data for analysis. It is possible that with a slightly larger sample and a longer time horizon, the results of this research would be somewhat different. The other limitation of this research is also reflected in the fact that there was not enough space in the article to examine the influence of foreign exchange reserves on the management of the Monetary trilemma macroeconomic policies in Serbia. Therefore, the inclusion of international country reserves in these considerations could be the subject of some further future research.

Concluding Remarks

This research has proven that Serbia, unlike many other countries, does not face the challenges of choosing two of the three policy options of the *Impossible monetary trinity*. In the observed period from 2006 to 2022, the country showed a gradual increase in exchange rate stability with pronounced and long-standing restrictions on the capital account, which was accompanied by a moderate absence of monetary autonomy, at least measured by the deviation of the domestic money market rate from the Eurozone money market rate. Although, according to the postulates of the Monetary trilemma theory, Serbia's monetary independence could be much greater, the latest AREAER report states that the country *de jure* implements a soft managed floating exchange rate regime, while in essence, i.e. *de facto* it is classified as a stabilized arrangement (IMF, 2023, pp. 3285-3286). This implies that the short-term dinar exchange rate has remained within its range of 2% for the last six months or longer, it does not float, and that its stability appears as a result of the actions of the official monetary authorities. All this further refers us to the conclusion that there is enough room left for the country to increase its monetary sovereignty, assuming that this stand is in line with the official and unofficial goals of its monetary and economic policy.

Serbia has been conducting a noticeable policy of a *de facto* fixed, i.e. stable exchange rate for a long time. At the same time, fixing the exchange rate actually implies renouncing of monetary autonomy and placing monetary policy in the function of its defence, thus essentially prioritizing the maintenance of the exchange rate in relation to inflationary goals, financial stability and economic growth. In this way, a fixed exchange rate leads to the absence of active monetary policy and monetary sovereignty, that is, to a kind of voluntary renunciation of the free management of domestic currency (Obradović, 2020), which can lead to the accumulation of numerous financial and economic difficulties. Namely, this kind of exchange rate regime, and especially its hard pegs, leads to the absence of an independent monetary policy because in such regimes it cannot be adjusted, while the country's interest rates are tied to those of the monetary anchor country (Stone, Anderson & Veyrune, 2008). Among other things, Serbia decided to adopt the *de facto* fixed exchange rate of the dinar due to the activities of various lobby groups and foreign investors, whose economic interests are favoured and supported by this kind of monetary regime (Šoškić, 2015, p. 18). These facts also explain the absence of a linear relationship among the observed variables, and therefore the non-functioning

of the Monetary trilemma in Serbia. Namely, it seems that Serbia, in its quest for a stable exchange rate, voluntarily renounced its monetary sovereignty, but also the freedom of its capital flows.

In addition, domestic monetary policy has been actually more restrictive than necessary for a long time, as it has *de facto* shifted from inflation targeting, as the officially proclaimed monetary model, to exchange rate targeting. This shift also contributed to somewhat lower rates of economic growth, while the domestic monetary policy prevented itself from managing the amount of dinars in circulation more freely. Also, this kind of monetary model, among other things, does not represent an acceptable solution for getting out of the crisis. Finally, a high degree of unofficial euroization is also present in the country, which in itself implies monetary stability and the absence of a certain degree of monetary sovereignty. Euroization in Serbia, combined with the growing current account deficit and the decline in price competitiveness of the domestic economy, has turned into a serious threat to the sustainability of such monetary regime (Janković & Stanišić, 2012, p. 397).

Bearing in mind that the policy of using the exchange rate as a nominal anchor in conditions of consistently higher domestic inflation than that in the Eurozone has caused the emergence of high unofficial euroization, we can conclude that Serbia missed an opportunity to continue with conducting a successful exchange rate policy (Miljković & Vučković, 2006, pp. 253-254). For 17 years, Serbia has been officially implementing pure inflation targeting in the circumstances of its financially underdeveloped and highly euroized economic environment. However, since the results of this monetary strategy did not give the expected outcomes, it should be resorted to reducing euroization, increasing the institutional independence of the monetary authorities, reducing the sensitivity of inflation to commodity prices, reducing non-performing loans and increasing the level of transparency of the central bank foreign exchange operations with the aim of increasing efficiency of the inflation targeting strategies in the country (Šoškić, 2015, pp. 26-27).

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THE IMPACT OF IMPORTS AND EXPORTS ON ECONOMIC GROWTH: PANEL DATA ANALYSIS

Abstract

This paper aims to answer the question of whether import and export have a positive impact on the movement of the gross domestic product in selected countries of the European Union (EU). In the paper, a panel data regression analysis has been applied in the EViews 8 software package. In countries with a high level of income that were selected for analysis, a positive relationship between the observed macroeconomic variables by determined which is statistically significant. The results showed that imports had a greater impact on the gross domestic product than exports in the selected countries for the observed period

    Key words: import, export, economic growth, empirical analysis.

JEL classification: *F14*

УТИЦАЈ УВОЗА И ИЗВОЗА НА ЕКОНОМСКИ РАСТ – ПАНЕЛ АНАЛИЗА

Апстракт

Циљ овог рада је да одговори на питање да ли увоз и извоз позитивно утичу на кретање бруто домаћег производа у одабраним земљама Европске уније (ЕУ). У раду је примењена регресиона анализа панел података у софтверском пакету ЕВиевс 8. У земљама са високим нивоом дохотка које су одабране за анализу утврђена је позитивна веза између посматраних макроекономских варијабли, што је статистички значајно. Резултати су показали да је увоз имао већи утицај на раст бруто домаћег

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производа од извоза у одабраним земљама, за посматрани временски период.

Кључне речи: увоз, извоз, спољна трговина, привредни раст, бруто домаћи производ, емпиријска анализа.

Introduction

The period in which the belief that the country should export but also apply protectionist measures when it comes to imports has long passed. Today, all the countries in the world sell part of the products produced on their territory to foreign markets. In addition, the needs of consumers in the domestic market cannot be fully satisfied by-products produced by domestic producers. For this reason, part of the products are imported from abroad. The growth of international trade occurred due to the process of globalization. This process took place quickly after the fall of the socialist regimes, and today it is even faster due to the digitalization process. The initiators of this process were, above all, countries with a high of income.

Imports represent the amount of goods and services that are imported from abroad to meet the needs of the domestic market. Previously, it was considered that imports adversely affect economic development yet that opinion has partially changed. What is important is to look at the structure of imports. If products for final consumption are imported, they certainly have an unfavorable impact on economic development. However, if raw materials are imported, which will be processed and then exported in the form of final products, which have added value in their price, as well as services, from which benefits will be realized later, this does not have to be the case. Exports, on the other hand, represent the amount of goods that are produced in a country and placed on the foreign market. Exports have a positive impact on the economic wealth of the country because it leads to an inflow of funds from abroad. The mercantilists also talked about this in their works. They argued that wealth is reflected, in money and that it can be obtained based on foreign trade. According to their opinion, the foreign trade balance must be active it must sell more to others and buy less.

Respecting the consumption principle of calculating the GDP, we can see that it is obtained as the sum of household consumption, gross investment, government spending, and the difference between imports and exports (Kitanović & Golubović, 2003). Therefore, imports are seen, as a negative component of the GDP. However, if import represents the basis for the production process of products that will later be exported at a higher price, as the basis for the development of techniques and technology that will enable a more efficient production process, that import can in no way be viewed as a negative component of the gross domestic product and economic growth. On the other hand, the growth of the gross domestic product has an impact on exports and imports. Therefore, there is a cause-and-effect relationship between these macroeconomic variables. With the growth of the GDP, exports also increase because the entire production cannot be placed on the domestic market, and thus the total wealth also increases. Also, the growth of the GDP leads to an increase in imports due to increased economic wealth and growth in

aggregate demand, but also due to an in the for raw materials, which are necessary for the production process to take place. There is no unified opinion on the relationship between these variables, and these relationships by the subject of analysis by economists for many years. There are opinions about a positive relationship between the given variables, but also those that indicate, that there is a negative influence of imports on the movement of the GDP. For this reason, the paper will examine these attitudes using the example of countries with a high income, using panel data regression analysis.

Literature review

The correlation between foreign trade and a country's economic growth is a subject that draws the interest of numerous economists. Several studies theoretically analyzed the relationship between these macroeconomic variables, but earlier studies have focused on the impact of exports on economic growth. Recently, the question that is being asked more and more is what impact imports have on economic growth and vis versa. Before defining the hypotheses and models and presenting the results of the conducted research, we will display a review of the literature, that is, the results of researchers who have dealt with this topic. Ballast (1978), in his research, concluded that there is a positive relationship between exports and economic growth, using data from 11 developing countries. He proved that the growth of exports affects the gross domestic product in the countries that were included in the analysis.

Considering data for the period 1960 to 1991 for Kenya, Pakistan, Sri Lanka, Cameroon, Ghana, Madagascar, Senegal, and the Ivory Coast, Onafowora et al. (1996) concluded that exports lead to economic growth in the countries that were the subject of their analysis. Rani and Kumar (2018) reached similar results when it comes to the impact of exports on economic growth. They found a positive relationship between imports, exports, and economic growth. Hagemejer and Mućk (2019), analyzed this impact based on data from the countries of Central and Eastern Europe and concluded that exports in the period, from 1995 to 2014 had an extremely significant positive impact on economic growth. On the other hand, a group of authors concluded in their papers that exports do not lead to economic growth. Jung and Marshall (1985) determined the weak influence of exports on economic growth by applying the Granger causality test to the example of 37 developing countries. Daratt (1986) concluded that there is no relationship between exports and economic growth in the example of Taiwan, Hong Kong, South Korea, and Singapore. Devkota and Panta (2019) reached the same conclusion, analyzing exports and economic growth in Nepal.

Hye et al. (2013) analyzed the example of six countries, in South Asia. They investigated the impact of exports on economic growth, the impact of imports on economic growth, and the impact of economic growth on exports and imports. When it comes to the impact of exports on economic growth, it is confirmed in five observed countries, except for Pakistan. The positive impact of economic growth on exports was observed in four countries, except in Nepal and Bangladesh, while the positive impact of economic growth on imports and imports on economic growth was confirmed by these authors in all countries that were the subject of their analysis. The BRICS economies are widely regarded as the foremost trading bloc and emerging economies on the global

stage. These countries have been analyzed by Raghutla and Chittedi (2020). The study they applied is the Johansen cointegration methodology to determine the relationship in the long run and the Granger causality test for the period 1979–2018. The findings of the study confirmed that economic growth was boosted by exports in India, South Africa, and China, while exports positively influenced the economy in Brazil and Russia. Economic growth positively influenced imports in Brazil, India, China, and South Africa, while imports fueled economic growth in Russia. So, based on their results, they confirmed that trade-led economic growth is valid.

Maitra (2020) tested identical hypotheses as Raghutla and Chittedi, but using the example of India. Based on the analysis, she concluded that imports have a stronger impact on economic growth in both the short and long term, while exports have an impact on India's economic growth only in the short term, and are weaker than imports, while in the long term, the impact is positive. but extremely weak. When it comes to the impact of economic growth on exports and imports in India, in this study, it is positive and statistically significant. Therefore, in the literature, there are no unique views on the relationship between the mentioned macroeconomic variables. For this reason, in the continuation of the work, we will analyze the relationship between the observed variables in the example of six member countries of the European Union: Belgium, Luxembourg, the Netherlands, Germany, Italy, and France. Based on the conducted tests and analyses, we will contribute to the analysis of this topic and confirm or refute the hypotheses that were defined below.

Methodology and Hypothesis

To perform a panel data regression analysis, a sample comprising six high-income countries was delineated. The criterion used in the selection of countries is that they are countries with a high level of income and members of the European Union. The final decision that these should be the Benelux countries, as well as Germany, Italy, and France, was that they have been part of the EU since its inception, that is, the European Economic Community (EEC), as a union that preceded the European Union. The time range for which the analysis was carried out is from 2015 to 2021, where quarterly data for the given period was used. Based on the used literature, the defined sample of countries, as well as the period for which the research is conducted, is adequate for conducting panel data regression analysis (Agung, 2009; Dragutinović-Mitrović, 2002) therefore the results that will be obtained can serve for making conclusions.

The hypotheses that we will test in this research are the following:
- H1: Exports have a positive impact on economic growth in the observed countries;
- H2: Imports have a positive impact on economic growth in the observed countries.

The data used to conduct research and test defined hypotheses were collected from the Eurostat website (https://ec.europa.eu/eurostat/en/). The data taken from the site are data on total exports, imports, and GDP in millions of euros in current prices and refer to quarterly periods of the year. Employing panel data regression analysis

for the examination of a specified dataset enables the exploration of both structure and heterogeneity among defined units of observation. Additionally, it facilitates the analysis of structural changes over the observed period (Dragutinović-Mitrović, 2002). The amalgamation of time series and cross-sectional data results in an augmentation of the degrees of freedom, thereby enhancing the statistical power of the conducted tests (Agung, 2009). The conducted testing will allow us to prove or disprove the defined hypotheses.

In the econometric literature, concerning panel data regression analysis, the most commonly referenced models include the pooled model, the fixed effects model, and the stochastic model, also known as the model of stochastic effects (Greene, 2002). Before proceeding with the analysis of panel data and the interpretations of the obtained results, it is necessary to decide which of the models we have listed is adequate for the analysis. Appropriate econometric tests are used for this purpose. The step from which we start, when we decide on which of the models is adequate for the analysis, is the F-test. This test provides a decisive answer regarding the suitability of the pooled model for the given analysis (Green, 2002). The null hypothesis in this context is that $\alpha_1 = \alpha_2 = \ldots = \alpha_N$, signifying homogenity in the constant terms (Green, 2002). The regression analysis for the pooled panel model is executed in the EViews 8 software package, applying the following formula:

$$y_{it} = \alpha + \beta_{1xit1} + \ldots + \beta_{kxitk} + \varepsilon_{it};$$

$$_i = 1, \ldots, N; \; _t = 1, \ldots, T; \; _k = 1, \ldots, K, \qquad (1)$$

where: N – the number of units of consumption; T – number of periods; K – value of the k independent variable, i unit of observation in the period t.

Before entering the defined variables into the model, the data were logarithmized. The model itself, after entering the variables, can be displayed using the following form:

$$ln\_GDP = \alpha + \beta 1 ln\_EXP_{it} + \varepsilon_{it};$$
$$ln\_GDP = \alpha + \beta 1 ln\_IMP_{it} + \varepsilon_{it}; \qquad (2)$$

where: ln_EXP – logarithmic export amount; ln_GDP – logarithmic amount of gross domestic product and ln_IMP – logarithmic amount of imports.

If the null hypothesis is accepted, indicating that the variance of the members is zero, the pooled panel model is deemed more suitable for the given analysis than the fixed effect model. Conversely, if the null hypothesis is rejected, signifying that the variance of the members is not zero, then the fixed effect model proves to be a better choice than the pooled panel model. In contrast to the pooled panel model, in the fixed-effect model, the parameter α is not constant but varies with each unit of observation, remaining constant over time (Kennedy, 2008). The fixed effect model can be econometrically represented by the following formula:

$$y_{it} = \alpha_i + \beta_{1xit1} + \ldots + \beta_{kxitk} + \varepsilon_{it}$$
$$_i = 1, \ldots N; \; _t = 1, \ldots T; \; _k = 1, \ldots K. \qquad (3)$$

To ascertain the suitability of a stochastic effect model for a given analysis, conducting the Breusch-Pagan LM test is imperative. This test operates on the hypothesis that the variance of the members is zero. If this hypothesis is rejected, indicating that the variance of the members is not zero, it implies a significant stochastic influence in the model. In such a scenario, opting for the model with stochastic effects is deemed more appropriate than the pooled model for the analysis at hand (Green, 2002). The model can be represented by the following formula:

$$y_{it} = \alpha + \beta_{1xit1} + \ldots + \beta_{kxitk} + v_i + \varepsilon_{it}$$
$$_i = 1, \ldots N; \; _t = 1, \ldots T; \; _k = 1, \ldots K \qquad (4)$$

In the context where "vi" represents the random effect for each individual spatial unit, and "α" denotes the common constant term for all units of observation, if the conducted tests indicate that both the model with fixed effects and the model with stochastic effects are suitable for the analysis, the ultimate choice between the two is determined through the application of the Hausman test (Green, 2002; Kennedy, 2008).

Results of panel data regression analysis and discussion
The results of the tested hypothesis H1

In the part where the research methodology is defined, it is seen that the F-test is performed first. The value of the F statistic, which was obtained when hypothesis H1 was tested, is 212.4653 with a significance level of 0.000 (p < 5%). This leads us to the conclusion that we reject the null hypothesis, asserting homogeneity in consonant terms, and instead, accept the alternative hypothesis. This implies that the model with fixed effects stands as a suitable alternative for testing the initial hypothesis. The results of the pooled model are in Table 1.

Table 1 Pooled model results - F test

Dependent Variable: LN_GDP
Method: Panel Least Squares
Periods included: 28
Cross-sections included: 6
Total panel (balanced) observations: 168

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.823017	0.744504	3.791808	0.0005
LN_EXP	0.852941	0.058516	14.57619	0.0000
F-statistic	212.4653			
Prob.	0.000000			

Source: Calculated by authors

Table 2 shows us the results of the fixed effects model. The results of this model show us that with an increase in exports by 1%, there is an increase in the gross national product by 0.45%. Before these results can be accepted, it is necessary to conduct additional testing.

Table 2 Fixed effect model results

Dependent Variable: LN_GDP				
Method: Panel Least Squares				
Periods included: 28				
Cross-sections included: 6				
Total panel (balanced) observations: 168				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.977708	1.480583	5.388222	0.0000
LN_EXP	0.445185	0.117118	3.801182	0.0006
R-squared	0.798479			

Source: Calculated by authors

The results of the Breuch Pagan LM test, which are shown in Table number 3, show us that there is a notable stochastic effect in the given model, whicgh suggests that the stochastic effects model could serve as a viable alternative for testing hypothesis H1.

Table 3 Results of Breusch Pagan LM test

Lagrange multiplier (LM) test for panel data			
Total panel observations: 168			
Null (no rand. effect)	Cross-section	Period	Both
Alternative	One-sided	One-sided	
Breusch-Pagan	122.2279	4.044449	126.2723
	(0.0000)	(0.0143)	(0.0000)

Source: Calculated by authors

In order to be able to decide on the appropriate model, the Hausman test was carried out, the results of which can be found in Table 4. Based on these results, it can be seen that for testing the first hypothesis, a model with a stochastic effect is adequate, because the probability The Chi-Square statistic surpasses the 5% (p = 0.0609 > 0.05) (Asterious, Hall, 2016).

Table 4 The result of the Hausman test

Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.511604	1	0.0609

Source: Calculated by authors

Referring to Table 5, it's evident that the coefficient associated with Ln EXP is positively signed (0.562989) and holds statistical significance, considering the p-value of 0.0000, which is below the 0.05.

These results show that there is a positive relationship between exports and GDP, which is statistically significant, that is, a 1% increase in exports leads to a 0.56% increase in the GDP in the observed countries, or, in other words, a change in the gross domestic product of 0.56%, can be explained by changes in exports of 1%.

Table 5 The result of the stochastic effect model

Dependent Variable: LN_GDP				
Periods included: 28				
Cross-sections included: 6				
Total panel (balanced) observations: 168				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.488479	1.276837	5.081680	0.0000
LN_EXP	0.562989	0.098816	5.697353	0.0000
R-squared	0.762963			

Source: Calculated by authors

The regression model's R-squared is 76%, indicating the model's effectiveness in explaining the relative changes in gross domestic product. Consequently, the model proves suitable for prediction. Despite the high R-squared value, the variables incorporated in the regression model exhibit a statistically significant level, affirming the absence of multicollinearity in the analyses and the derived conclusions.

The results of the tested hypothesis H2

The value of the F statistic, when it comes to testing the hypothesis H2, is 255.0132, with a significance level of p=0.000 < 0.05, which can be seen in the attached Table 6. So, based on this, we can conclude that the constant terms are not homogeneous and that the pooled model is not adequate for the given analysis, which means that a fixed-effects model may be adequate for testing of this hypothesis.

Table 6 Pooled effect model – F test

Dependent Variable: LN_GDP				
Method: Panel Least Squares				
Periods included: 28				
Cross-sections included: 6				
Total panel (balanced) observations: 168				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.183713	0.781749	1.514186	0.0378
LN_IMP	0.911950	0.061491	15.96913	0.0000
F-statistic	255.0132			
Prob.	0.000000			

Source: Calculated by authors

The results of the fixed-effects model are presented in Table 7. If the model with fixed effects is accepted as a good alternative, the obtained results tell us that with an increase in imports of 1%, there is an increase in the gross national product of 0.91% in the observed countries. However, before accepting these results, as in the case of the first hypothesis, it is necessary to conduct additional tests.

Table 7 Fixed effects model results

Dependent Variable: LN_GDP				
Method: Panel Least Squares				
Periods included: 28				
Cross-sections included: 6				
Total panel (balanced) observations: 168				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.549153	1.116389	5.866372	0.0000
LN_IMP	0.557811	0.088249	6.320883	0.0000
R-squared	0.788996			

Source: Calculated by authors

The Breuch Pagan LM test, the results of which are shown in the following Table 8, shows us that there is an important stochastic effect in the model. For this reason, the stochastic effects model is recognized as a good alternative for testing the second hypothesis.

Table 8 Results of LM test

Lagrange multiplier (LM) test for panel data			
Total panel observations: 168			
Null (no rand. effect)	Cross-section	Period	Both
Alternative	One-sided	One-sided	
Breusch-Pagan	122.4132	3.979776	126.3930
	(0.0000)	(0.0460)	(0.0000)

Source: Calculated by authors

Considering that both the fixed-effect model and the stochastic effects model can be good alternatives for testing the second hypothesis, it is necessary to conduct the Hausman test (Table 9), as it was done when we tested the first hypothesis.

Table 9 Results of Hausman test – hypothesis 2

Correlated Random Effects - Hausman Test			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	4.005110	1	0.0554

Source: Calculated by authors

As can be seen from the previous table, p = 0.0554 > 0.05, we conclude that for testing the second hypothesis, a model with stochastic effects is more adequate. Applying this model (Table 10), it was determined that with a 1% increase in imports, there is a 0.63% increase in the gross domestic product. Therefore, there is a strong positive relationship between exports and gross domestic product, which is statistically significant (p = 0.000).

Table 10 Results of the stochastic effect model

Dependent Variable: LN_GDP				
Periods included: 28				
Cross-sections included: 6				
Total panel (balanced) observations: 168				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.622675	1.044870	5.381218	0.0000
LN_IMP	0.631049	0.080303	7.858320	0.0000
R-squared	0.689483			

Source: Calculated by authors

This regression model has an R-squared of 0.68, i.e. 68%, which shows us how much this model explains the relative change in the gross domestic product. This obtained value, as well as the other obtained parameters, show us that there is no fear of the existence of multicollinearity.

Analysis results and recommendations for further research

Based on the conducted tests, it can be concluded that both defined hypotheses have been proven. Therefore, both export and import have a positive influence on the movement of the gross domestic product, which we have chosen as an indicator of economic growth, in the observed countries By proving the first hypothesis that exports affect economic growth, we confirmed the results reached by Ballasa (1978), Rani and Kumar (2018), Onafoeora et al. (1996) and Hagemejer and Mućk (2019). As can be seen in the applied model, exports in the observed member countries of the EU from 2015(Q1) to 2021(Q4), had a positive impact on the growth of the gross domestic product. Changes in exports of 1% can be explained by in gross domestic product of 0.56%, with a significance level of p = 0.000.

For many years was an opinion that imports negatively affect the movement of the gross domestic product and the whole economic growth of the country. Analyzes of the impact of imports on economic growth, and vice versa, have started to be carried out in recent years. In those analyses, it has been proven that imports can have a positive effect on economic growth, and in some cases more significantly than exports. In the conducted empirical analysis, we determined that imports and gross domestic product have a positive relationship and that this relationship is statistically significant, that is, changes in imports of 1% can be explained by changes in gross domestic product of 0.69%. In this way, we proved the second hypothesis and reached the same conclusion

as Maitra (2020), Hye et al. (2013), Rani and Kumar (2018), and Raghutla and Chittedi (2020). The result we reached is interesting, that in the observed period, there is a stronger connection between import and gross domestic product than export and gross domestic product. Maitra (2020) also came to similar results in her research. This means that the observed countries should look at imports favorably, and not as a negative component of the gross domestic product and economic growth to improve their economic growth in the future period.

The limitation of this research is reflected in the fact that different results could be reached if some other countries had been chosen for analysis. It is also, recommended that the impact of imports and exports on economic growth should be analyzed individually for each country to know which macroeconomic variable has a more dominant influence and which should be encouraged to accelerate economic development.

The recommendation for future researchers of this topic is to look at which components of import and export have the strongest influence on the movement of the gross domestic product in the countries that we have analyzed, which will make a significant contribution to the deepening of this topic.

Conclusion

Completely closed economies do not exist today. The process of globalization, which was encouraged by countries with high-income levels, led to the opening of economies and liberalization when it came to the movement of goods, services, labor, and capital. Increasing international trade flows have led to the fact that the area of import and export is increasingly studied in terms of using these macroeconomic variables as a basis for the economic growth of the economy. By analyzing these relationships, different authors came to different conclusions, which depended on the country they were analyzing. The fact that foreign trade is a source of economic power is still talked about by mercantilists, but economists have proven through empirical analysis that the source of economic growth can also be imported, which is conditioned by the structure of imports. Namely, if raw materials are imported, for their further processing or techniques and technology that will lead to an increase in production and an increase in the efficiency of the production process, then such imports certainly have an impact on economic growth. To analyze whether export and import affect economic growth, we defined a model in the paper and used data for six countries with a high level of income (Belgium, the Netherlands, Luxembourg, Germany, Italy, and France). The obtained results showed that both exports and imports have a positive impact on the growth of the gross domestic product. Import has a stronger degree of influence on economic growth compared to export, for the observed period. For this reason, the observed countries, with the aim of further increasing the gross domestic product, should encourage their import.

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EARLY DOCTRINE OF BUDGETARY INCREMENTALISM IN THE THEORY OF CHARLES LINDBLOM AND AARON WILDAVSKY

Abstract

Despite numerous attempts of contemporary financial executives to enhance the national process of public budgeting with innovative solutions, the model of traditional, incremental budgeting still withstands as a primary form of budgetary technicism. The crucial contribution to describing and radical popularization of incremental ratio in the field of public budgeting was made by American scientists Aaron Wildavsky and Charles Lindblom who are considered to be the pioneers of early doctrine of budgetary incrementalism.

Charles Lindblom approached the phenomenon of incremental decision-making in the context of wider social scene, advocating the advantages of marginal changes of public policy decisions in all spheres of decision-making as opposite to radical deviation from formerly adopted course of action. On the other side, Aaron Wildavsky explained with great precision the incremental ratio in decision-making process in the field of public budgeting, that is annual budget decision-making. According to Wildavsky, we should not pose the question how the process of public budgeting should look like ("what is a good budget?"), but we should only describe this process as it essentially is, or only could be. This leads us to the conclusion that incrementality, in the theory of early incrementalism, is viewed as an innate characteristic of budgeting process despite various reform initiatives.

Key words*: budgetary incrementalism, increment, marginality, budgeting process.*

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РАНА ДОКТРИНА БУЏЕТСКОГ ИНКРЕМЕНТАЛИЗМА У ТЕОРИЈИ ЧАРЛСА ЛИНДБЛОМА И АРОНА ВИЛДАВСКОГ

Апстракт

Упркос бројним покушајима савремених финансијских управљача да националне процесе јавног буџетирања оплемене иновативним решењима, модел инкременталистичког, традиционалног буџетирања још увек опстаје као примарни облик буџетског техницизма. Пресудан допринос у дескрипцији и радикалној популаризацији инкременталистичког рација у области јавног буџетирања дали су амерички теоретичари Арон Вилдавски и Чарлс Линдблом, који се могу сматрати утемељивањима ране доктрине буџетског инкрементализма.

Чарлс Линдблом је приступио феномену инкременталистичког одлучивања на ширем друштвеном плану, афирмишући предности маргиналних промена јавних одлука у свим областима одлучивања у односу на радикална одступања од праваца деловања усвојених у прошлости. Са друге стране Арон Вилдавски је инкременталистички рацио одлучивња веома егзактно објаснио на плану доношења ануалних буџетских одлука у процесима јавног буџетирања. Према Вилдасвском не поставља се питање какав би требало да буде процес јавног буџетирања („шта је то добар буџет“) већ би га требало само описати онаквог какав он у својој суштини јесте и какав би једини и могао да буде, из чега се изводи закључак да је инкременталност, у теорији раног инкременталисма схваћена као иманенетна карактеристика буџетског процес, без обзира на различите реформске иницијативе.

***Кључне речи**: буџетски инкрементализам, инкремент, маргиналност, буџетски процес.*

Introduction

Irrefutable popularity of incremental views pertaining to the nature of budgeting process has validated the promotion of budgetary incrementalism into an unsurpassable "technique" of public budgeting. From semantic point of view, the professional literature has witnessed for decades the development and maintenance of related identities between the categories "traditional budgeting" - "incremental budgeting" – "linear budgeting". It is an undisputable fact that the incremental pattern of public budgeting justifiably bears the epithet of "traditional" or "classic" budgeting, as much as the linear budgeting can be rightly identified as "incremental" budgeting.

The incremental pattern of behavior in the field of public policy decision-making represents significantly wider phenomenon compared to the content assigned to it by the contemporary theory of public finances. The incremental approach in decision-making process adopted by public policy executives is mostly analyzed in contemporary perspective in the field of financial management and decision-making process, often neglecting the fact that the same model can be applied and analyzed in all other fields of social activities.

The ultimately simplified meaning of the incremental concept assumes a gradual, incremental

intervention of decision makers in relation to the decisions that were adopted in the past. This idea was particularly popular in the field of public budgeting where gradual corrections of the formerly made decisions reflect the complex nature of the budgeting process itself, as well as the deficit of information that are vital to decision makers for adopting budget decisions. Hence, Allen Schick is right when he observes "To budget is to decide on the basis of inadequate information, often without secure knowledge of how past appropriations were used or of what was accomplished, or of the results that new allocations may produce." (Schick, 2002a, p. 8). This leads us to logical conclusion that "budgeting process is never quite settled since those who manage it are never fully satisfied" (Schick, 2002b, p. 8).

In a wider context, determining the concept of incrementalism, as a decision-making model in all fields of public action, is attributed to the theorist Charles Lindblom. In the first part of this research, the authors will point to the method which Charles Lindblom used to formulate basic characteristics of the incremental pattern of decision-making process, bearing in mind that his postulates constitute the idea based on which the American theorist Aaron Wildavsky developed and perfected, so called, doctrine of budgetary incrementalism. In addition to defining the initial characteristics of the incremental concept, the contribution of Charles Lindblom will also be reviewed through the prism of the fact that this theorist considered the incremental pattern in decision-making process as an innate characteristic of social and economic democracies. In order to justify the imperative of gradual decision-making by financial and political executives in general, the scientists favoring the theory of early incrementalism led by Lindblom, generally relied on the arguments that "conflicted actors in decision-making process can rarely agree on taking bold political moves, as well as that the elite from various fields of interest are happy to resort to veto power and gain considerable influence on slowing down the reform dynamics" (Weiss, Woodhouse, 1992, p. 257).

Applying Lindblom's theoretical bases of the incremental concept to wider social context, Aaron Wildavsky created its mirrored version in the field of public budgeting, which is the reason why this author is often referred to as the founder of budgetary incrementalism. However, in his large opus dedicated to this phenomenon, Wildavsky did not offer any new mechanism of public budgeting, but rather gave a precise description what, according to his opinion, national budgets really *are* and what they could only be. In the second part of this paper, the authors will analyze the basic arguments which Wildavsky used to defend the concept of budget incrementalism coming into conflict with progressive stands of the theorists who favored the ideas of introducing contemporary models of public budgeting which significantly deviated from the incremental ratio of decision making process.

In the third part of their research, the authors point to the extreme complexity of the endeavor to determine the concept of budgetary incrementalism in a theoretically comprehensive way taking into account, before all, its multidimensional nature. The authors will point out to the initial hesitation of financial theory in deciding whether to view budgetary incrementalism as a process or as a result of a certain process, given the fact that both static and dynamic components of this budgeting technique are clearly expressed. In case the budgetary incrementalism is viewed as a process, the authors

will then further analyze the complex content of this process, dividing it into the process of horizontal and vertical decentralization.

Conceptual bases of incrementalism in the theory of Charles Lindblom

Broad scope of the phenomenon of incrementalism as a theoretical concept significantly exceeds the framework of public budgeting, Namely, budgetary incrementalism represents only one evidence, maybe the most illustrative (or the most obvious one) how the pattern of incremental theory works at the *specific* level that could, as a complex phenomenon, be projected to the *entire* social and political decision-making process (general level). Hence, in the system of public policy decision-making, all the decisions and their consequences can be explained in the spirit of incremental ratio, no matter if they refer to budget decisions or any other aspect of public policy decision-making.

How should public decisions be made and with what support, at the same time striving to maximize their compatibility with public needs that seek fulfilment, is the question that all theories on public decision-making and planning have tried to give answer to. In light of the conflict between the aspiration to plan public needs in the form of a series of small incremental changes and the idea to create a unique comprehensive plan, theory has offered two basic instrumental models that can serve as a financial and political framework for planning public needs and for public decision-making in general (Rostron, 2008a, p. 512). Hence, while in the system of rational decision-making and planning the managers are focused on identifying the public goals, researching into all possible means for achieving them, considering efficient alternative solutions and, eventually, adopting a set of political decisions for the best results, on the other side the incremental approach relies on evolutive changes in public decision-making through a continuous cycle of experiments and adaptations (Rostron, 2008b, p. 512).

Incrementalism *versus* rationalism represents a conceptual dilemma which has been in focus of the reformists of national systems of public finances all over the world for decades. Speaking about the problem of the conceptual definition of incrementalism due to numerous and versatile dimensions of theoretical approaches to this phenomenon, we believe that emphasis should be placed on the most important specific characteristic of this mechanism that could not be discerned at any other alternative technique of rational budgeting. Without pretentions to offer a complete and comprehensive definition (which has not been achieved yet, despite the attempts made in financial, sociological and political theory), we could define incrementalism at *general level* as a mechanism of public policy decision-making and planning where the marginal effects of the decisions made in the previous period represent the starting point for the decisions to be made for the future period, when their effectuation is expected.

The initial contribution to the affirmation of the concept of incrementalism in general, as a social and political phenomenon in the sphere of public policy decision-meaning, is ascertained in the theoretical opus of Charles Lindblom which, without any doubt, represented a doctrinary preamble of the theory of budgetary incrementalism of Aaron Wildavsky and his followers.

Lindblom managed to identify a few characteristics whose presence in a concrete model of public decision-making, he believed, was a testimony of the existence of the incremental mechanism of decision-making process. Incrementalism is presented in public policy decision-making if policy makers: 1) take into account only limited set of politically relevant alternative decisions which differ from the current policies only up to the level of *increment*; 2) analyze only those aspects of adopted policy which are different from alternative solutions; 3) consider political decisions as a logical, *successive* series of decision-making process; 4) insist on *the marginal value* of various social values and restrictions; 5) apply *the combination of the estimation and empirical analysis* (rather than sole empirical analysis) when dealing with the consequences of the decisions reached in relation to independently determinedgoals; 6) take into account only *a small number* of all relevant social values that are included in their decision-making (Lindblom, 1961, , p. 306).

Based on the aforementioned imperatives that are attributed to incremental ratio of the public executives involved in decision-making process, we can come to an obvious conclusion that *marginality and regularity* are two key characteristics of this method. *Marginality* assumes legality in public decision-making "at the margin", that is in a way that the new content can be "injected" into formerly made political decision only to a minimum (marginal) extent. This characteristic is based on the application of the mechanism of incremental annual balancing of budget lines where the term "increment" is generally accepted to denote "the difference between what budget beneficiaries demand in the current budget year and what they received in the previous year" (Gist, 1977, p. 344). Such passive behavior of public executives can be explained by their inferiority to conduct a comprehensive analysis of the facts and circumstances related to every particular field od decision-making process in order to reach the solutions that will lead to better fulfillment of public needs. On the other side, *regularity*, as *differentia specifica* of the incremental method, assumes an operative routine in public decision-making, developed on the basis of standardized practices, which, as in the case of marginal rules, assumes the passivization of the managers involved in public decision-making.

Lindblom's approach to researching the incremental method in the sphere of public decision-making was to compare the characteristics of this method to the concept of *rational comprehensiveness* (Eng. „*room method*"), analizing in which fields of formalization *the concept of successive comparison* (Eng. „*branch method*" - Lindblom's semantic substitute for incrementalism) shows superior characteristics compared to largely popularized rationalism (Lustick, 1980, p. 342). Comparative advantages of incrementalism, in relation to its rival – rationalism, were analyzed taking into consideration several problematic areas: the selection of value-based goals, the analysis of means and goals, the criterion of "good" managing decisions and the issue of comprehensiveness.

Speaking about the first issue, the incremental approach to the selection of value-based goals which deserve financial and political sponsorship from budget funds, it relies on the negation of the possibility, that was proposed by the rationalists, to explore social preferences when making individual decisions, particularly those pertaining to complex value-related problems. Instead of a tempting idealistic solution where the public needs planners would first formulate the values (interests) at the level of each particular planning segment, and then create political decisions aimed at covering

these values, incrementalism offers much simpler solution – since the values and their mutual relations are very difficult to define, what is only left to public needs planners is to conduct a simplified selection of alternative political solutions which already contain various combinations of these values (Lindblom, 1959a, p. 82). Hence, the only value which is relevant for the public planners' selection is the *increment* which represents the difference between two alternative policies (Lindblom, 1959b, p. 82). The focus of decision makers only on the incremental, marginal values makes, according to the theorists of incrementalism, this technique of planning and formulating of public needs, thanks to its simplicity, the only operationally feasible technique.

The analysis of means and goals within the framework of rationalists' method, represents a significant component of decision-making process. We are speaking about the obligation of managers to follow the logical order which calls for *prior and independent* formulation of goals, followed by the selection of the means for their achievement, while, on the contrary, the incremental concept assumes the identity of means and goals, which makes this analysis pointless. Similar to Lindblom, other theorists of early incrementalism did not make the effort to analyze "middle solutions", that is the models of public policy decision-making that would represent a functional cohesion of the components of an incremental and rational (comprehensive) model. These models, judging by the nature of contemporary budgetary technicism, are increasingly gaining importance.

Initiation of budgetary incrementalism in the theory of Aaron Wildavsky

The incremental approach to describing the nature and dynamics of public budgeting process represents the first, relatively completed, theoretical analysis in the sphere of public budgeting. Although, from the angle of contemporary budgetary technicism, the incremental approach is exposed to multiple qualitative criticism since it promotes numerous innovative mechanisms of budget modelling, still, there is an undisputable fact that this doctrine, even in domain of modern public finances, relentlessly manages to find the ways to emphasize the need for its own (re)affirmation. Despite a rather argumentative rationalists' criticism of the effects of the implementation of budgetary incrementalism, a large number of authors still believe that this doctrine remains the leading direction that the budget theory pursues at the global level.

In an attempt to discover the sources of theoretical initiation of the concept of budgetary incrementalism, we have established that the roots of this doctrine are linked to the reactions to the theoretical challenge that the American political scientists Valdimer Orlando Key presented in his famous essay „The Lack of Budgetary Theory", published in the 1940s. The essence of Key's "lamenting" can be reduced to the appeal for the ultimate shaping of the budget theory that would finally move on from the descriptive research of basic issues of budgeting "mechanics", such as: the organizational and procedural bases for budget preparation, the methods of submitting the financial plan proposals by budget beneficiaries, the official structure of budget documentation, etc. (Key, 1940a, p. 1137). According to Key, such a straightforward theoretical exploitation of procedural (formal) elements of public budgeting blurred the significance of the

analysis of the mechanism of public funds *allocation*, as the essential preoccupation of budget planners. Underlining the need for researching the allocative budget mechanisms is, from historical point of view, motivated by the rise of state interventionism as a superior Keynesian alternative to the mechanism of "invisible market hand".

Looking at the budget document as a decision regulating the allocation of meager public funds *per definitionem* for the purpose of maximizing the benefits for a social community, Key came up with his famous question: *"on what basis shall it be decided to allocate X dollars to A activity instead of to B activity"?* (Key, 1940b, p. 1137). In this way he opened the door to a complex and unexplored area, challenging the economic doctrine to respond to this issue, or to prove the pointlessness of Key's "allocation rebus". (Mayers, 1996, p. 172).

Key's normative essay was written in the period when both the rationalists and "realists" operated in domain of partial and superficial analysis of budget phenomenology and, therefore, it is not surprising that his review on the allocation problem is significantly based on the criticism of both (pairs) theoretical courses.

Speaking about early research in the field of rational budgeting, Key points to rationalists' one-sidedness in glorifying the principle of efficacy at the level of microbudget entities. Without disputing the legitimacy of the need of the participants in microbudget planning to use or to plan using the available funds with maximum efficacy, Key underlines that the format of the estimation of microbudget's efficacy is much less important than the allocation of microbudget efficacy. In other words, even if the participants in microbudget planning succeed in their attempt to plan and realize their needs in the most efficient way, this does not automatically result in maximizing the benefits for the society itself in the circumstances when this relative function, from the point of the general interest, is not even necessary, that is when the public funds for its financing could be allocated for other purposes that would bring larger benefits to society. (Key, 1940c, p. 1139). While he criticized rationalists for their superficial insisting on *efficacy*, his principal objection was aimed at the predecessors of radical incrementalists and their superficial insisting on the effects of *marginality imperatives* on making allocation decisions. The doctrine of marginal utility, whose full applicability was achieved in domain of planning of business decisions of market participants, was questioned in relation to decision-making mechanism in the field of public spending. (Mayers, 1996, p. 1143).

Speaking about Key's "allocation rebus", we could say that those stands which pointed to the paradoxicality of the posed question ended far more popular than those which attempted to answer it. Among the first group of stands, the largest attention was paid to the opus of the American professor Aaron Wildavsky who distinguished himself in contemporary theory of public finances as the most important protagonist of the view on the unquestionable superiority of the incremental course in the analysis of public budgeting process. In addition to Wildavsky, the contribution of the following authors to the theory of incremental budgeting was of immeasurable importance: Lindblom, Fenno, Davis, Sharkansky and others.

The majority of stands that Wildavsky presented in his works were factually based on the views of the reformists of the system of public budgeting in the USA related to the imperatives of, what is colloquially called in political practice, "good budgeting". According to Wildavsky, the widespread obsession of the reformists with

the concept of "good public management", that is with the principles of effectiveness and efficacy, is marked by the capital failure of the reform leaders to understand that any change in the field of public budgeting will eventually impact the allocation ("who gets and how much"). In other words, no budgetary reform can be marked as neutral and proclaimed as "universally beneficial" for all people, which was the initiation of rising rational course. (Wildavsky, 1964a, p. 183).

In the spirit of such reasoning, Wildavsky points to Key's appeal for creating a budget theory that would be essentially normative and, in terms of responding to the question *how a good budget system should be structured*, would reach ideal contours of public budgeting. The incrementalists, led by Wildavsky, remained adamant in opposing the possibility of normative theoretical modelling of the mechanism of budget decision-making, considering such endeavors as classic forms of utopistic reasoning. In our attempt to systemize the basic arguments that the incrementalists used as guidelines, we had to start from understanding the nature of the budget act as a financial reflection of government's political plans. Taking into account that no political plan can be implemented without relying on budget projections, the creation of the ideal theoretical framework for budget decision-making would also mean the creation of *a political theory* that would promote a universally applicable pattern of *"good political decision-making"*. In this way, according to incrementalists, the creative role that the executive power plays in social life would become purposeless. The normative budgeting theory, according to incrementalists, would, therefore, inevitably become *a political theory*, that could not be verified as a result of its own ambitiously wide scope (Wildavsky, 1964b, p. 184).

In addition to general labeling of rational normative theory as a kind of utopian, Wildavsky argued the reasons why *the ideal model* of rational budgeting was not sustainable. To certain extent he agreed with Key's criticism of blind insisting of the rationalis theory on budget efficacy and pointed to the fact that the key budgeting problem did not lie in the method of maximizing the budget benefits, but rather in establishing their scope and in identifying the subjects who will receive them. On the other side, no matter how strong is the desire of contemporary budget reformists to promote the efficacy concept in public budgeting as an imperative, this is not possible without the reform of the political process of budget decision-making. The introduction of innovative models of rational budgeting without changing the political pattern in budget decision-making and the roles of the participants in this process, would be, according to budgetary incrementalists, doomed to fail from the outset.

Since it was aimed at discovering the ideal performances of public budgeting, the rational normative theory had to offer the models of budgeting techniques through which such "ideality" could be attained, as well as to invent such an operative political framework that would guarantee the realization of those criteria. According to incrementalists' opinion, the possibility that any of these two conditions are met in practice, is very limited. Given the fact that the process of public budgeting is generally expected to address the need for the fulfilment of potentially highly incompatible aspirations (achieving efficient allocation of limited public resources, preventing financial bankruptcy, respecting the demand for gender and intergenerational equality, achieving fiscal stabilization, etc.), any kind of normative model would be doomed to fail in the absence of a clear consensus between the key actors in public budgeting

process related to the selection of goals and their ranking (Mayers, 1996, pp. 174-175). Merely, the programs financed from the public funds, as well as their *outputs*, represent the object of divergent perception of various participants who assign different values to such programs (Fölscher, 2007a, p. 112). Since the country of "universal consensus" has never existed (Wildavsky, 1961, p. 184) and since this fact is of both notorious and unchanging character, therefore, the quest for the objective methods of prioritizing various programs (goals) remains purposeless. Adamant insisting on finding the ways to eventually reach such a consensus (for example, via viewing the society as a unique organism to which a certain set of preferences is artificially assigned) is considered to be a form of *theoretical totalitarianism* (Fölscher, 2007b, p. 112). In addition, unlikelihood to reach the agreement on universally accepted public goals (programs) could result, in the circumstances of fragile political systems, in *political totalitarianism* where the decisions of the inner political leadership (often - the individuals) are automatically considered to be compatible with social preferences and social interests.

The above stated arguments of theoretical and conceptual nature represented a sufficient motive for Wildavsky and his followers to develop *a priori* suspicion towards every single reform of American budget system that was inspired by positive intentions to create an instrumental and procedural framework of "good budgeting". Instead of searching for "good budgeting" techniques, the incrementalists propose a description of what budgeting really is, and, taking into account the entire political framework of budget decision-making, what it could only be. From historical point of view, the initial attempts of the implementation of early operative concepts of rational budgeting (for example, the *Planning Programming Budgeting System)* resulted in institutional and political unreadiness and relative absence of expected results of the reforms, which constituted strong grounds for the legitimacy of incrementalists' criticism. Nevertheless, by enhancing the environmental and procedural framework for the implementation of novelties in the field of budget technicism, there was less room for accepting the unquestionable reasoning of leading theorists of budgetary incrementalism.

Difficulties in determining budgetary incrementalism in an integral way

The beginning of the end of unquestionable rule of incremental doctrine in domain of budgetary technicism (especially in the 1960s and 1970s) is vividly explained by the statement that this concept became so operatively popular that at the end "had to be killed by its own weight" (Ainswort, Hall, 2011, p. 29). Although the concept of the incremental budgeting pattern is rather simple, which is considered to be its major advantage, the content of its individual theoretical elements ("base", "increment", etc.) is extremely complex. This is the reason why it was a difficult task to challenge the legitimacy of scientific attempts to explain incrementalism in a multifunctional way. In that context, the two dimensions of budgetary incrementalism which are most commonly distinguished are - *descriptive and explanatory.* In the first case, the process of public budgeting can be considered to be descriptively incremental if the changes in the process of planning public expenditure are marginally different in relation to *status quo,* while, on the other side, budgeting process can be explained by

incrementalism only in case of pointing to *the reasons* of the mentioned marginality. (Wanat, 1974, p. 1221).

The transition of incremental theoretical course from general to specific one (from general political decision-making to budgeting) was followed also by the transition of the inconsistency and ambiguity, the inherent characteristics of the political, "Lindblomian" concept of incrementalism. (Bailey, O'Connor, 1975, p. 60). Although the pattern of the operationalization of the concept of incrementalism is apparently simple, in theory we can distinguish quite different approaches to its determining, so that we cannot but wonder whether the studies analyzing budgetary incrementalism actually speak about the same phenomenon. Is it possible to unify the meaning of the concept of budgetary incrementalism and in what way is the question which has remained open to this date, so it is not surprising that the same process in the analysis of one author is considered incremental, while the other author denies this characteristic.

The concept of budgetary incrementalism that was developed in the literature in the field of policy decision-making and budgeting is rather disappointing from the aspect of precision and expository clarity. (Bailey, O'Connor, 1975, p. 60). Without disputing the fact that it would be very difficult to reach a complete theoretical unification of the incremental concept, we believe that it is important that numerous deterministic approaches should be reduced to those that nullify each other to the least possible extent.

Speaking about the need for the unification of the content assigned to incremental budgeting, the core of the confusion related to this process lies in the preferences of a number (even a prevailing number) of authors in this field to use denotative approach when determining incremental budgeting - by listing the characteristics whose presence in the concrete budgeting model points to an incremental budgeting technique. Although legitimate, such perspective remained inconsistent in relation to the issues whether the listed characteristics of incremental budgeting should manifest together in a cumulative way, or the presence of any of them should lead to a conclusion that it is an incremental approach?! If we accept the first approach, then it would be very difficult to recognize whether the cumulative criterion has been fulfilled in any concrete budgeting system; on the other side, the acceptance of other solution would mean that every "Lindblomian" characteristic of incrementalism can be turned into an independent "definition" of incrementalism, whereas there would be a significant logical inconsistency among them. (Berry, 1990a, p. 168).

William Berry undertook to perform a studious analysis of all the approaches that are available in theory related to determining the incremental pattern of public budgeting, where he managed to synthesize no less than twelve definitions (six of them were derived from Lindblom's analysis of incrementalism as a sociological pattern, while the other six are exclusively linked to domain of public budgeting, mostly relying on the Wildavsky's views). In an attempt to avoid extending the problem of content-related determining of incrementalism to the entire field of public budgeting, here we will focus on the most significant definitions-characteristics which are solely linked to the field of public budgeting.

Budgetary incrementalism - the process or the result of the process

The major works of Aaron Wildavsky in the field of public budgeting reflect rather large evolving changes related to understanding of the term "incremental". Although they are undoubtedly useful, the definitions which originate from this author's views raise questions rather than provide answers. Certainly, the most significant problem remains in domain of completing, that is of rounding up the theoretical concept of budget *increment.*

In early works of Aaron Wildavsky the focus of the concept of budgetary incrementalism was on the *marginality* of budget decisions, i.e. incrementalism was viewed as budget decision-making *process* which, we could say, recognized the legitimacy of the budget "base", i.e. the expenditure that was confirmed and realized in the previous budget period, and where the decision makers were focused only on those public needs which required minimum modification of this base. (Wildavsky, 1964, p. 13). Although in this way incrementalism was presented as a process, we could state that its key determinant is actually the *result of the process* embodied in the scope of "minimum" changes that were made compared to the previous budget period. Therefore, the budget decisions are incremental to the extent to which they result in "marginal" changes of public expenditure (Boyne, Ashworth, Powell, 2000a, p. 53).

From later works of Aaron Wildavsky and his followers, which dealt with empirical assessment of the presence of the incremental pattern in the system of public budgeting in the USA, it is possible to reach a conclusion that incrementalism is not as much based on the marginality as it is on the *regularity* of decisions related to public expenditure. (Dempster, Wildavsky, 1979, pp. 371-375). This radical turn *per se* calls for the need to adapt incrementalism to the fact that, in American practice of budget decision-making, the decisions of budget planners related to the scope of public expenditure were increasingly moving away from the zone of "minimum changes", whose scope, by the way, has never been uniformly determined, not even by the incrementalists. The absence of unanimous agreement as for the content and scope of the term *increment* represents major weakness of the incremental doctrine. (Tucker, 1982, p. 333). In literature, there is an opinion that such a change of focus of radical incrementalism, from its scope to the regularity of changes in public expenditure, has led to a significant erosion of the status of budgetary incrementalism as an explanatory theory, where such wandering from marginality to regularity has made the content of the term increment critically fluid (Sharpe, Newton, 1984, p. 81). Literal interpretation of the revised understanding of incrementalism in budget decision-making would lead to the recognition of this concept even in cases of drastic annual growth of public expenditure (of 100%) under the condition that such a growth is periodically stable. However, we believe that Wildavsky did not want to go too far in revising his original stand but that, evidently, his intention was to "couple" regularity, as a newly promoted characteristic of incrementalism, and marginality together. Namely, by interpreting Wildavsky's principal motivation aspects, we can conclude that marginality and regularity are seen as *"the servants"* of the *stability* of public expenditure changes, which this author considers to be the axiom of the public budgeting incrementalism. Whether and to what extent this stability will be based on smaller or larger annual increments depends, before all, on the character of the norms which comprise the rules governing decision-making process in the field

of public expenditure planning. Since these norms, by rule, favor smaller increments, we could accept the view of some authors as legitimate – that insisting on regularity does not represent negation of marginality of incremental planning. (Boyne, Ashworth, Powell, 2000b, p. 54).

Budgetary incrementalism as the process of vertical and horizontal decentralization

The failure of the mechanism of public expenditure planning to attain the degree of "rationality" that would be based on the full respect of public interest, resulted in the conclusion reached by incrementalists that public budgeting can be viewed exclusively as a *political process* permeated by various forms of institutional conferring ("negotiations") (LeLoup, 1978, p. 503). Particularity of political interests and roles results in different perceptions of the mere purpose of public budgeting process: while the budget beneficiaries who plan their own microbudgets (Engl. *agencies)* are pre occupied with the possibility of getting as large expenditure extensions as possible, on the other side, the financial and political authorities are focused on the possibility of reducing them. The third side in this equation, the legislators, are expected to determine the optimality of budget decisions based on their contribution to the possibility of making a choice where, by the nature of things, legislative ratio is rather more inclined to choose the extension than the reduction of the proposed expenditure (Bozeman, Strausmman, 1982a, p. 510).

Starting from the view that "budgeting is incremental because it is consensual", American incrementalists asserted that the post-war system of public budgeting in the USA showed an increasing deviation from incremental postulates since, according to their belief, this consensus was compromised. (Jones, 1997, Wildavsky, 1992). The consensus in reaching decisions related to public expenditure, as a form of a coordination of vertically positioned actors in decision-making process, represents an important characteristic of budgetary incrementalism, where the negotiation strategies, which the participants in vertical negotiations rely on, are in the main focus of incrementalists' attention. The emphasis that these strategies place on the scope of incremental changes, while the base (the level of expenditure from the previous period) remains same, deprives the participants of a comprehensive periodic re-evaluation of the totality of public expenditure. (Bozeman, Strausmman, 1982b, p. 510). Moreover, such format of meaningful re-evaluation becomes impossible in the circumstances of clearly expressed vertical "competition".

The incrementalists are inclined to view the consensus in budget planning as any other process which results in identical or similar treatment of different public programs (expenditures), as opposed to the scenario where individual programs are singled out under the scheme of favored treatments. This means that in case when there is an annual growth of public expenditures, the consensual pattern points to the fact that the growth increment is divided among all programs (expenditures) in a reasonably equal way, while in case of the decline increment, the burden of public expenditure cuts would also be shared with the same reasonable equality, but this time in relation to the *reduction* of all government programs. (Jones, Baumgartner, 1997, p. 1322). Horizontal

decentralization in the system of public expenditure planning assumes the absence of the competition among individual decisions related to the allocation of public funds for certain purposes. The incrementalists assert their stand that the process of making individual allocation decisions must be kept separate from the "prioritization" process, that is from the assessment to what extent the effects of a particular decision of one microbudget's participant will bring the benefits for the society that exceed the effects of alternative allocation decisions of other microbudget's participants. In this way the incrementalists give additional contribution to the stability of administrative structure of public decision-making that should be based on simple rules while, on the other side, increasingly complex and sophisticated forms of political strategies (which include the competitive elements in allocation decisions) are classified into the corpus of "deviant cases" (Natches, Bupp, 1973a, p. 955).

Putting the emphasis on the analysis of the subjects of microbudget planning (agencies) and their, more or less, anticipated behavior while planning their own needs, has resulted in a significant statistical achievement of incremental, quantitative budget studies (Natches, Bupp, 1973b, p. 955). However, when the focus of the analysis shifts from the *agencies* to *programs* as "the operative units of public policies", (McKean, Awshen, 1965, p. 286), then we can speak about a considerable erosion of the applicability of incremental views related to horizontal decentralization. The planning of programs, as a complex form of the operationalization of public needs, is inextricably linked to strategic assessments of the degree of their contribution to public interests which, correspondingly, makes the issue of intra-program competition extremely relevant.

Budgetary incrementalism as an isolated process

The technique of incremental (linear) budgeting is often believed to be isolated from the effects of external variables that could "threaten" the imperatives of marginality and regularity in planning public expenditures. Favoring only the internal variables (particularly the political restrictions and cognitive limitations of the subjects involved in the planning process) by the theorists of early incrementalism was the result of the opinion that incrementalism is the product of "standard budgeting circumstances", while the non-incremental changes are the result of the effects of abnormal environmental conditions in which the planning of public expenditures takes place (Boyne, Ashworth, Powell, 2000c, p. 56).

If we accept the fact that the scope of planned expenditures is preconditioned by the scope of public needs from the previous planning period, then we automatically imply the absence of any influence of economic, political and all other external variables on the character of budget decisions. (Berry, 1990b, p. 173). However, the actual appearance of non-incremental changes in the process of public expenditure planning pointed to the need for abandoning such an ignorant attitude of radical incrementalists related to the issue of their significance. In later works of Aaron Wildavsky, as the most prominent protagonist of budgetary incrementalism, the possibility of having non-incremental changes in public expenditure planning is partially recognized, only in the form of random, accidental cases, and only as those restricted to one budget cycle.

If we prefer external variables of exclusively political character, then the linear budgeting is in the position to act as an apolitical and non-ideological mechanism that

can be applied in any environmental framework. In a certain way, this actually means that incremental rules in decision-making process are not "subdued" by politics, but, on the contrary, it is the duty of each newly created political establishment to engage in financial planning aimed at covering public needs and complying with the canons of budgetary incrementalism. Such incremental reasoning is based on the fact that the changes of a political course, which in democratic systems occur through a natural change of power in the election process, are not radical to the extent that their manifestation through the mechanisms of budget planning would demand a drastic deviation from the "base". Therefore, the change of power does not undermine the incremental nature of changes in planning the public expenditure, except in case of extremely rare (revolutionary) metamorphoses of social and political ambient when the entire corpus of formerly articulated public needs are subjected to re-evaluation, which makes the deviation from the base inevitable.

Concluding remarks

National budget, as the concentrate of ideas on fiscal policy, has long time ago ceased to be just a financial instrument of plain "distribution of public funds for basic state needs", not excessively overburdened by financial planning. Such an unpleasant role was assigned to budgets by the representatives of the classic "laissez-faire" school of economic thought who strongly opposed the idea that a budget should have any other function, but the financial and, of course, political one. This was, according to the these classic theorists the key method for drawing a demarcation line between the rules and functions of the market and the rules and functions of the public sector. The breakthrough of Keynesian school of economic thought, as a logical consequence of the imperfection of the "laissez-faire" doctrine in the analysis of market phenomena, brought radical changes in terms of the role of state in creating the course of national economy and these changes became permanently incorporated in the mechanisms of budget decision-making process.

The concept of budgetary incrementalism, founded by American theorist Aaron Wildavsky, which can be considered to represent a traditional approach to budget decision-making, has been for a very long time exposed to significant and argumentative criticisms in relation to its theoretical stands. Apart from their obvious advantages related to the simplicity of budget decision-making and control, the budgets prepared according to the incremental model have significant deficiencies. Mainly, it is the fact that this budgeting technique does not fully take into consideration the dynamics of the needs which are financed from budget funds, which is particularly emphasized in dynamic ambient of modern economies. In the circumstances when the budget lines from the previous budget periods are projected to the future period with only minor changes and no performance evaluation, the efficient allocation of public funds becomes the victim of "roboticized" budget management. Therefore, such a pattern which assumes minimum modification in the content of budgetary decisions between budget periods, tends to "passivize" managing capacities of those in charge of making allocation decisions and "tame" sophisticated character of budget planning.

Nevertheless, modern theorists, who favor the ideas of rational budgeting, would have a very difficult task in attempting to challenge the conceptual grounds laid by

theoretical promoters of incremental budgeting who built this technique of public budgeting to the level of a doctrine. The main reason for this lies in the fact that Aaron Wildavsky, resorting to the ideas of Charles Lindblom, offered a theoretical model of public budgeting which represents a comprehensive and complete circle with clearly expressed political, financial and bureaucratic component. Wildavsky's basic postulate to view the mechanism of national budgeting as a *par excellence* political process has survived to this date, resisting the attempts of rational theorists to move the financial planning process away from the sphere of political decision-making and to subdue it to the economic imperatives of economy, efficacy, and effectiveness. This unbeatable element of Aaron Wildavsky's doctrine was recognized by many representatives of rational school who had made many futile attempts to apply the radical models which depart from the established incremental pattern. Bearing in mind this fact, we could conclude that, despite the elements of rational modernization which are definitely present (program-based budgeting, performance-based budgeting, etc.), the national budgeting systems in majority of modern countries remained dependent, in one way or another, on the political dimension of budget decision-making process.

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THE COMPLEXITY OF GAS PROCUREMENT IN THE EU CAUSED BY THE WAR IN UKRAINE

Abstract

The war in Ukraine affected the global world in many segments, including production, trade, energy supply, and inflation worldwide. And while the economy of Germany and other EU member states are facing numerous challenges in terms of sanctions, among all EU members this crisis will perhaps create the biggest alliance and consensus in terms of preventing the gas import dependence from Russia. With the strengthening of economic relations among the EU members, it is necessary to expect that in the political sense, an even more significant gap will be created between the East and the West.

This paper analyzes the available data on the impact of the war in Ukraine on the reliability of gas supply to the EU. Based on comparable secondary data and historical facts, this paper focuses on the previous and current issues of gas procurement and distribution within the EU, but also on the challenges of the future supply of EU member states with this energy.

The war in Ukraine has produced a domino effect on global and regional gas trade and the economy. Many causal reactions are already having wide-ranging consequences for the European economy. The gas prices increase, transport costs increase, prices of food and many other goods had been increased, as well as EU economic sanctions against Russia that have already affected the gas trade structure and energy balances of EU members, today have a huge impact on global and regional infrastructure investments. Current anticipations are that the Ukraine war will cause Europe's greatest gas crisis and long-term decisions non-seen since the Cold War.

Key words: *gas procurement, gas import, gas export, gas import dependence*

JEL classification: *D30, F50, Q49*

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СЛОЖЕНОСТ НАБАВКЕ ГАСА У ЕУ
ИЗАЗВАНА РАТОМ У УКРАЈИНИ

Абстракт

Рат у Украјини утицао је на глобални свет у многим сегментима, укључујући производњу, снабдевање енергентима и храном, трговину и општи раст цена широм света. До се економије Немачке и осталих чланица ЕУ суочавају са бројним изазовима на пољу увођења санкција Русији, ова криза ће можда међу свим чланицама ЕУ створити највећи савез и консензус по питању смањења ризика увозне зависности од увоза гаса од Русије. Са јачањем економских односа између члница ЕУ, логично је заочекивато да ће у политичком смислу бити створен још значајнији јаз између Истока и Запада.

У овом раду анализирају се доступни подаци о утицају рата у Украјини на поузданост снабдевања гасом замаља ЕУ. Заснован на упоредивим секундарним подацима и историјским чињеницама, овај рад се фокусира на претходна и тренутна питања набавке и дистрибуције гаса унутар ЕУ, али и на изазове будућег снабдевања ЕУ чланица овим енергентом.

Рат у Украјини је произвео домино ефекат на глобалну и регионалну трговину гасом и економију уопште. Многе узрочне реакције већ имају широке последице по европску економију. Поскупљење цене гаса, повечање трошкова транспорта, поскупљење хране и других добара, као и економске санкције ЕУ према Русији, који су већ утицали на структуру трговине гасом и енергетске билансе чланица ЕУ, данас имају огроман утицај на светске и регионалне инфраструктурне инвестиције. Тренутна предвиђања су да ће рат у Украјини изазвати највећу европску гасну гризу и дугорочне одлуке које се несу виделе још од доба Хладног рата.

Кључне речи: Набавка гаса, увоз гаса, извоз гаса, зависност од увоза гасаа

Introduction

Ukraine has a border with 4 European Union (abbreviated EU) member states Poland, Romania, Hungary, and Slovakia as well as with Belarus and the Republic of Moldova. Ukraine, with its population of about 44 million people, is of great importance for the European Union as a transit country for Russian gas but also as an emerging market. This means that "insufficiently' integrated Ukraine is a political and economic slack for Europe.

The focus of this paper is related to the impact of the war in Ukraine on the gas procurement and distribution in Europe and energy supply challenges considering the war in Ukraine started on 24th of February 2022 it is also important to mention that the Ukrainian-Russian conflict started in 2014. In order to understand the wider context of the international energy trade relations affected by this conflict, it is necessary to include certain relations from 2014 to 2022. It is also important to mention that the objectivity of this paper is in the question of the mark since there is not enough available data from parties involved in the conflict and synchronized and live tracking of data related to gas export and import. Until

the completion of this paper, there were still no officially available data on the quantities of exported or imported gas that were presented in the official annual reports, but certain insights were detected and used in this paper.

In November 2013 the Ukrainian government decided not to sign a planned Association Agreement with the European Union. This action of the Ukrainian political leadership led to civil demonstrations in the capital Kyiv, lately called "Euromaidan" demonstrations. The demonstrations turned violent, brought early elections and a new government was elected by the Ukrainian parliament. In the same year appeared conflicts in the Crimea peninsula in Ukraine and the Donetsk and Luhansk regions of eastern Ukraine usually called Donbas. A majority of the Russian population take over authority and declare the independence of Crimea. The Crimean "autonomous" assembly held a referendum on union with Russia and since the majority voted for it, subsequently Russia completed the annexation of the peninsula. However, the Donbas region in the following years continues to be the battlefield.

Thereafter, in June 2014 Ukrainian government signed the Association Agreement with the EU. In January 2016 Deep and Comprehensive Free Trade Area agreements (DCFTA) between the EU and the six Eastern Partnership countries (abbreviated EPC - Ukraine, Armenia, Azerbaijan, Georgia, the Republic of Moldova, and Belarus) get into force. In September 2017 the Association Agreement entered into force and since then EU become the main trade partner for Ukraine and the volume of trade exchange increased from year to year. At that time the EU takes Ukraine as a leading partner in the Eastern Partnership countries region and promotes this example to other Eastern partners in their European integration. On the other side, Ukraine took this role to strengthen its political standing as a regional leader and set goals to develop democracy and maintain political stability to achieve integration into the EU.

Literature review

Some authors provided interesting and different theories, hypotheses, and ideas about how armed conflicts and wars affect trade between parties involved or in a regional or global context. The war in Ukraine definitely has a huge global impact since both Ukraine and Russia are huge global actors in the exports of crops, steel, and energy.

Both liberal and realist authors who elaborated different theories of interdependence and conflict mainly agree that trade and other economic exchange will be significantly affected in case of armed conflict between two or more parties involved. According to Barbieri and Levy (1999), "…societies engaged in any form of conflict or war usually cease or reduce any kind of trade". From the side of liberal theories, they stated that they "generally assume that political leaders are deterred from engaging in conflict when they anticipate that conflict will disrupt or eliminate trade or adversely affect the terms of trade, so the hypothesis that trade deters war rests on the assumption that war impedes trade." From the other side, realist theories according to the same authors "suggest that the concern over relative gains will lead at least one of the belligerents to terminate trade in order to prevent its adversary from using the gains from trade to increase its relative military power".

Based on postulates provided by Barbieri and Levy, 10 years later, authors Glick and Taylor (2010) stated something that is absolutely correlated to the facts present in the particular case of Ukraine, "Conventional wisdom in economic history suggests that conflict

between countries can be enormously disruptive of economic activity, especially international trade." Among other statements, authors asserted that wars have large and persistent impacts on trade, inflation, national incomes, and global economic welfare. The same authors also completed an exercise that provided indications that "costs associated with lost trade might be at least as large as the conventionally measured direct costs of war, such as lost human capital, work estimates the economic costs of war arising from the destruction of trade". Completed econometric exercise and analysis shown revealed that these costs are highly persistent and quantitatively large.

On the other side authors Anderson and. Carter (2001) explained that the hypothesis "trade promotes peace" rests on three premises: "(1) Societies achieve salient gains from their trading relationships; (2) serious conflict among societies disrupts trade; premises 1 and 2 enter the calculus of political decision-makers." Taking into account the hypothesis "trade promotes peace" and considering the fact that Ukraine changed its trade direction from East to West could be also some of the causes for the current state. Sounds ironic, but according to this, history really can be repeatable, more than twice.

Hence, Djukic (2014) investigated the issue concerning the Russian impact on EU via gas infrastructure. He explained very clearly why the EU economy depends on Russian gas, and why Russia uses the gas pipelines and gas to impact the EU policy, trade, economy, and security. Namely, the EU uses the privileged gas prices in gas procurement from Russia, reliable placement through gas pipelines, and the gas placement is most affordable with a low level of risk concerning gas placement reliability. On the other hand, Djukic justifies the Russian usage of gas and gas infrastructure to impact the EU policy in different areas. According to Djukic, NATO's extension to the East had an impact on Russian security, and besides this NATO stakeholders also uses the European countries to dominate the region on the basis of mercantilist concepts. These long-term processes had an impact on Russian attitudes against Ukraine's position in EU and NATO associations.

Besides all this, the general infrastructure that supports the gas distribution from Russia to the EU is located in Ukraine. To respond to this strategic disadvantage, Russia decided to extend the gas pipeline infrastructures in the North and East of Europe. Tensions between Russia and the West had increased, and EU plans concerned with long-term gas procurement were affected. This had an impact on trade with gas i.e. gas structure misbalance between Russia and EU members.

Gas trade misbalance

The cause of this trade misbalance and increases in prices is the energy dependence of the EU on Russia. Many members of the EU are very dependent on Russian gas. In 2021, the EU imported 83% of its natural gas. In January 2021, 53.8% of the gas was from Russia and 46.2% from other countries. From February 2021 the percentage of imports of gas is in constant decline and in November 2022 was only 12.9% according to European Commission, (data provided in Figure 1 below).

Figure 1. The European Union's diversification away from Russian gas
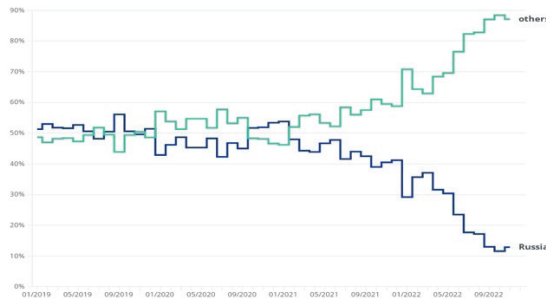
Source: European Commission 2022

The most of gas in the EU is used for electricity and heating 31.4%, households 24%, industry 22.6%, and others, (according to www.consilium.europa.eu). In the last years was noticeable many disagreements among EU member states concerning issues in different spheres. Russian attack on Ukraine achieved the near-impossible, uniting European countries in condemning such action. However, after 6 blocks of sanctions, further sanctions related to the imports of oil and gas from Russia again provides many disagreements among some EU member states. Many effects of the war in Ukraine, as well as economists' estimations, predict a rapidly worsening outlook for the world economy. Already raised prices of food, energy, fuel, fertilizer, and other commodities are followed by heightened financial volatility, sustainable development divestment, complex global supply chain reconfigurations, and mounting trade costs.

As it is described in the Introduction part Ukraine – Russia and EU – Ukraine relations significantly evolved since 2014. Geopolitical movements, the changed direction in trade from East to West, and the internal condition in Ukraine as a divided society are some of the reasons which triggered the global sphere of influence.

In this regard, the war in Ukraine produced a domino effect on within EU and global trade, as well as on the entire global economy. Many cause-and-effect reactions already have wide-ranging repercussions for the European and global economies. The price of gas and other energy items, food, and many other commodities, as well as the EU's economic sanctions that hit trade and investment already, have a huge impact on the global market in many sectors.

The weight of the issue in terms of gas procurement - the causes of current circumstances

During 2020 and 2021 the Covid-19 pandemic caused a long list of problems for all countries, especially to EU. Due to the Covid-19 pandemic, many measures have been applied, such as vaccinations, limited mobility, and luck down during specific periods. As the EU is defined as an area where people, capital, and merchandise can be moved without limitations, boundaries, and additional costs, this pandemic had a huge effect on EU functionality and budget.

Despite the Covid-19 consequences on the economy of the EU, all members of the EU have faced war in Ukraine issues. The worst immediate impact of the Ukrainian war on the European economy represents the energy supply triggered by the increase in gas and oil prices, due to Europe's dependence on Russian sources. Besides the currently immeasurable impact on the manufacturing sector, most will suffer poorer households, who spend a larger share of their income on energy bills. The same situation is related to the global sphere in countries that import a high share of different commodities from parties involved in the conflict but is also triggered by the increasing cost of transportation which directly affects many countries in the world. Due to numerous reactions of many countries, the impact of the crisis will have an influence on investors' sentiments why many projects which supposed to address unemployment and other needs of developing nations will be on hold.

According to the available data (McElhatton, 2022), by analyzing gas prices on the Dutch TTF stock exchange, in Figure 2 we can see that already in June 2021, the price of gas began to rise above the decade maximum, which did not exceed more than 30 euros/MWh. The maximum price in 2021 was 100.48 euros/MWh. After the Russian attack on Ukraine, in March 2022 the price of gas was 125.78 euros/MWh, to reach the historical maximum in November 2022 with 345.00 euros/MWh. After this maximum, it is in a drastic decline, and after a slight increase in November and December 2022 to 147 euros/MWh, it continued to fall further so the price of gas is currently 45.52 euros/MWh. The table below shows the gas price trend over the last 4 years with a visualization of the impact of the Covid-19 crisis and the most significant events related to the war in Ukraine (GIS, 2022).

Figure 2. Natural gas EU Dutch TTF (EUR/MWh), period 2013-2023
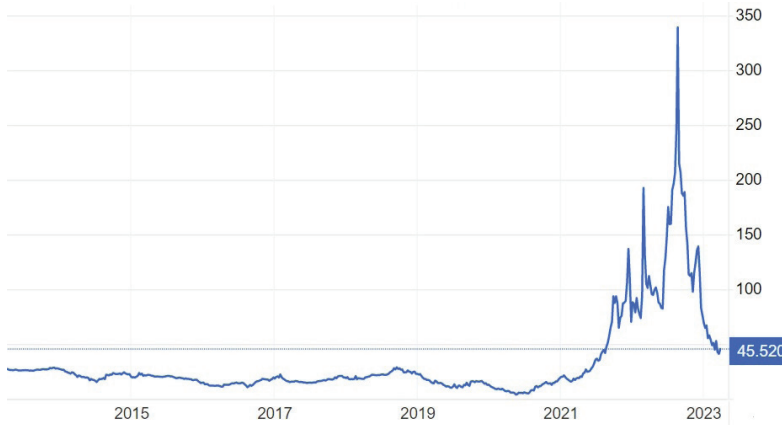
Source: www.gisreportsonline.com, retrieved April 2023

Concerning the gas price level on the global gas market, the structure of procurement of gas in the EU in the period January- November 2022 sums up to be 25.7% (Liquefied Natural Gas, hereinafter abbr. LNG, from USA, Nigeria, and Qatar), Norway 24.9%, Russia 24.6%, Algeria 11.6%, and other sources. The structure of procurement of gas in the EU is subject to changes, and the direction of structure changes does not go in the favor of Russia, (GIS, 2023).

Generally, from the corner of fuel dependency on Russia, several European countries

are highly dependent on the imports of fuel from Russia, in the first place oil and gas. In 2021 EU imported 83% of its natural gas consumption and more than 40% of its imported gas came from Russia as well as 27% of Russia's oil (European Commission, 2022). Developing situation in Ukraine and a complete cut from Russian gas quickly and rapidly led to higher energy prices. This scenario ripple through the economy from higher heating and fuel bills to costlier transport and power for businesses. According to IEA from April 2022, crude oil prices have increased by around 60% while gas prices are doubled. The most dependent EU countries are Slovakia, Lithuania, and Finland with 63% of imports of fuels, Bulgaria with 59%, Poland with 50%, Hungary with 41%, Estonia with 38%, Romania with 37%, the Czech Republic with 36%, Latvia 26%, Greece 24%, Italy 22%, France 12%, etc., (IEA, 2022). According to Carnegie Europe, Germany pays Russia 217 million euros every day out of the EU's total of 800 million euros for the energy supply, mostly on gas and oil.

Besides the EU's dependence on oil, the most sensitive problem is the EU's dependence on gas. According to updated OPEC annual reports and using the data from Eurostat in 2021, the picture below illustrates EU member states and the percentage of their dependency on Russia's natural gas, (Eurostat, 2022).

Figure 3. Proportions of gas imports by European Union countries from Russia in January 2022
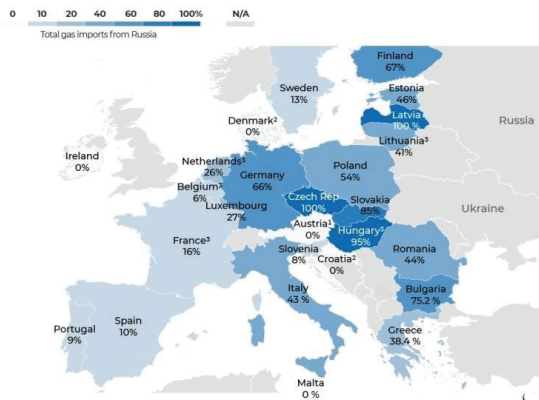
Source: Eurostat 2022

The total cost of the EU's imports of gas in 2019 was 60 billion euros, while in 2021 was 170 billion euros. An estimation predicts that a 50% cost increase for new shipments and assuming a halving of the Russian gas supply could provide a cost of 370 billion euros for the European Union. From Figure 3 above we can notice that highly dependent countries on Russian natural gas are the Czech Republic and Latvia with 100%, Hungary with 95%, Slovakia with 85%, Bulgaria with 75.2%, Finland with 67% and the European largest economy Germany with 66%, (Eurostat, 2022).

Regarding absolute values, the table below presents data on imports of gas by European countries from 2013 to 2021 in millions of cubic meters. In the observed period, the largest consumer of Russian gas was Germany (row 1), then Italy (row 2), and France (row 3). A significant drop in volume in the last 2 years is caused by the Covid-19 pandemic why many economies were forced to reduce production, (Eurostat, 2022). This image increases the image of EU gas dependence on Russia in terms of quantity.

Table 1. Hugest amounts of gas imported by EU members from Russia

Countries	2013	2014	2015	2016	2017	2018	2019	2020	2021
Germany	97,777	89,896	102,517	97,379	118,694	88,347	94,786	80,439	84,808
Italy	61,966	55,757	61,266	65,284	69,650	67,872	71,065	66,392	72,995
France	48,205	42,731	42,356	44,399	46,485	47,070	53,220	45,301	45,349
Spain	35,489	36,384	32,391	32,405	34,626	34,817	37,209	32,485	36,968
Poland	12,485	11,819	12,121	14,679	15,727	15,766	17,451	17,416	18,502
Hungary	8,176	8,942	6,790	7,552	9,845	7,740	11,669	7,936	7,479
Austria	6,421	7,709	6,072	7,498	8,464	7,831	11,377	6,462	4,754
Slovakia	5,269	4,757	4,407	4,378	5,248	4,396	6,707	4,301	5,131
Greece	3,864	2,931	3,162	4,067	4,975	4,902	5,221	5,902	6,426
Finland	3,488	3,063	2,713	2,496	2,322	2,641	2,594	2,568	2,571
Sweden	1,085	891	812	917	1,067	1,139	1,088	1,446	1,224

Source: Eurostat, 2022

Hence, Figure 4 visualized the share of natural gas imports from Russia in 2020 (Mark, 2022). The picture is also illustrated gas pipelines from Russia to Europe and Turkey.

Figure 4. The European share of natural gas imports coming from Russia, January 2022
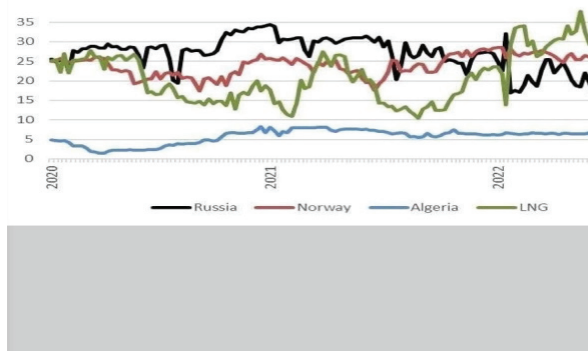
Source: Mark, 2022, (adapted by authors)

European countries, especially EU members, received relatively cheaper Russian gas through several gas pipelines from Russia. The gas pipeline lines from Russia to the member countries of the EU went from north to south through the Baltic Sea, via pipelines *North Stream 1* and North Stream *2* with a total capacity of 110 billion cubic meters per annum (hereinafter abbr. *bcmpa*). Also, through Belarus to Poland and Germany (*Yamal* 33 *bcmpa)*, then through Ukraine (*Brotherhood* and *Soyouz* 40 *bcmpa)*, via the Caspian Sea to Romania, Bulgaria, and Greece, and through Turkey (*Turkish Stream* 16 *bcmpa)*. Business relations in the supply chain were at a high level, as evidenced by the joint partnerships of Russia and Germany in the construction of the Nord Stream 1 and 2 gas pipelines, (Pisani-Ferry, 2022).

The North Stream 1 project was started in 1997, and due to numerous changes in ownership and administrative barriers, gas delivery began in September 2011. The North

Stream 2 project started in 2011 and was completed in 2021, but it never became operational due to political reasons and Germany's decision not to issue the necessary operating permit due to Russian influence on the events in Ukraine. Project North Stream was supported by Russia and EU countries, in the first place Germany and Holland. Despite all efforts by both parties, the North Stream 2 has been accomplished, and activated, but not for long. In September 2022, both gas pipelines were sabotaged by an unknown party, (Planete Energies, 2023). In addition to the environmental damage caused by the release of a huge amount of methane into the atmosphere, the entire supply of gas to the North Stream 2 Pipeline A was interrupted. Pipeline B of the North Stream was not damaged in this sabotage, but although Russia offered to continuously distribute through this pipeline, Germany refused. There are 3 versions of potential perpetrators of these sabotages. Some authors blame the US, some Ukrainian tycoons, and some Russia.

In addition to the challenges with gas procurement, the EU faced a significant increase in gas prices, due to unavailable gas pipelines and sanctions decreased options to import from Russia, the lack of terminals for processing liquefied natural gas into a gaseous state in order to distribute it to final users, the increased cost of transport and other commodities, and due these reasons with general inflation. However, Europe was forced to look for alternatives and find a way to switch from Russian natural gas to liquefied natural gas.

Due to reduced gas purchases i.e. procurements from Russia, the deficit had to be compensated in some way. Considering the limited capacities of gas pipelines from Africa and the Middle East, the only possibility turned out as a quick feasible solution is the procurement of liquefied natural gas. To illustrate this deficit, in the table below, you can see how in 2022 the import of gas from Russia drastically decreased, while on the other hand, the supply of LNG increased linearly, which makes interesting insight.

Figure 5. European Union natural gas import sources
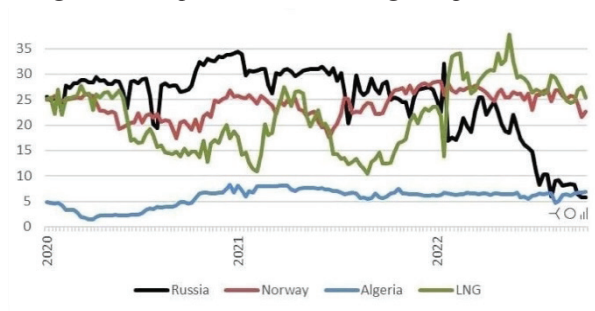
Source: McElhatton, 2022

Procurement of large amounts of LNG to prepare Europe for winter 2022 has encountered many challenges. According to KPLER (provider of intelligence solutions for commodity markets), the European Union imported 94.73 million tons (hereinafter abbr. *mt*) of LNG in 2022, which is an increase of 65.41% to in 2021 (57.27 mt). The largest exporter of LNG to the EU in 2022 is the US with 41% or 38.86 mt. This percentage is not represented in Figure 5, while Russian, Norwegian, and Algerian percentages did. In second place with 15.96% is Russia with 15.12 *mt*, imported almost entirely from independent producer Novatek, while in third place is Norway with 13.45 *mt* or a share of almost 14.20%. The third

place also takes Qatar with the same percentage as Norway. Liquid natural gas in the amount of 19.72 mt came from the African continent, which represents a share of almost 20.82%, while 80% of this LNG was distributed by Nigeria, Algeria, and Egypt, (Source Kpler, 2023).

As we may notice, the import of LNG by the EU from the US is not represented in Figure 5. To make the image clear we use an additional figure (Figure 6) of US export by destinations in different regions. The US gas export proportion in the EU gas total imports has increased in the last few years. To illustrate this, in the table below, according to data from the US Energy Information Administration, we can see how LNG US exports to Europe have increased significantly since December 2021. According to available data, the US exported 23.59 mt more to the EU compared to 2021, and this represents an increase of 154.49%, (EIA, 2023). At the same time, since June 2021, LNG deliveries from the United States have exceeded gas deliveries from the Russian company Gazprom. Gas balances are changing significantly, there is a transition to LNG, the appropriate infrastructure is being built for this, and logistics are being optimized.

Figure 6. US LNG exports by destination region for 2020-2022
(one bar represents one month)
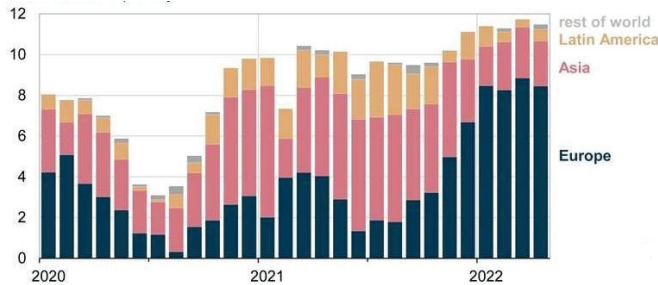
Source: US Energy Information Agency, 2023

These changes caused additional changes in the gas and oil trade relationship between the EU and Russia, and farther between Russia and USA. After several blocks of sanctions were introduced to Russia, the Russian ruble began to lose its value, so it reached its peak in March 2022 when it lost its value toward the euro by about 25%. One of the main reasons was that the EU has frozen Russian assets in the EU in the amount of 21.5 billion euros while assets of the Central Bank of Russia are blocked in the EU and G7 countries worth over 300 billion euros. Currently decreased volume in gas and oil export also could be a factor of ruble values decreases. But, after the EU introduced a fourth package of sanctions toward Russia in response to the invasion of Ukraine in March 2022 Russian Government requested payment of gas and oil in rubles. With the reduced value of the ruble, Russian exports would bring in less income, which would have incalculable consequences in the case of an endangered economy with numerous sanctions and inflation. A larger ruble fund imposed in this way would enable Russia to control inflation, but also to challenge the dominance of the USA, i.e. dollars on global money markets. In this regard, it is interesting that world reserves in dollars in 1999 sum up to 71%, while today they are less than 59%. In 2013, Russia had 150 billion dollars in US dollar reserves, while in 2021, it had just under 4 billion in US dollars. Initiatives to reduce dependence on the dollar in recent periods have been noticeable around the world, mostly in Latin America and Asia.

According to media reports, Poland, Bulgaria, and Finland refused to pay in rubles, why deliveries were suspended in April and May. Besides these EU members and other countries, against the sanctions they applied over Russia, found the protocoled solution to procure the gas from Russia. Importers from other EU countries opened accounts in Gazprombank in accordance with the instructions, but although the payments were made in euros, they were converted to accounts receivable in rubles under more favorable conditions. Future payments between Russia and China will be made in rubles, and in yuan as well, (Kemp, 2021).

On the other side, at the same time, EU representatives became concerned with gas dependency from the US. In October 2022 French Finance Minister Bruno Le Maire criticized US relations in exporting LNG to Europe. He said that conflict in Ukraine should not result in American economic domination and a weakening of Europe's economy saying "We cannot accept that our American partner sells its LNG at four times the price at which it sells it to its own companies." (Politcopro, 2023).

Conclusion

After Syria and the migrant crisis, after the COVID-19 pandemic, the war in Ukraine strongly shook the foundations of the EU and the whole world as well. When EU countries were confronted with this war scenario, they were already exhausted by the economic, social, and political costs of the pandemic. A fragile EU has to cope with an increase in defense spending while reducing energy dependency and dealing with high inflation and the huge number of refugees from Ukraine.

Because of its dependence on Russian oil and natural gas, Europe appears to be the region most exposed to the consequences of this conflict. Replacing all Russian natural gas supply to Europe is impossible in the short to medium run. The EU with its member states' governments has shown they are prepared to accept a certain economic pain for their citizens and treasuries with imposed sanctions on Russia and with promised support to Ukraine and refugees. Hence, in 2021, the EU initiated new gas infrastructure projects. During 2022 several gas interconnectors are constructed: between Greece and Bulgaria, the Polish Slovak gas interconnector, the Baltic pipe, delivering gas from Norway, as well as a new floating LNG terminal in Eemshaven in the Netherlands. These new infrastructure projects are supposed to contribute to the security of the gas supply and replace Russian pipeline gas, especially in Central and Eastern Europe.

Not only the EU, but the whole world needs to act with urgency to support countries affected by the crisis. This crisis will leave deep and long-lasting scars, and therefore further medium and long-term policy proposals will be needed subsequently. Certainly, some decisions have to be reconsidered and applied as soon as possible, because of one fact. Exchanging huge amounts of gas imported from Russia can't be done, even in the long term. Changing the concept of energy basis and concept of production competition can be taken into consideration, but any concept change takes with itself a certain level of risk. Taking into consideration of gas and oil-based production relation among all EU members, this option brings additional risk, a risk of consensus of all EU members regarding the energy concept changes. Not only European unity but also the stability of some European governments will depend on the balance between sacrifices and costs. The longer the war in Ukraine drags on, the more fragile European unity will be. Differences over the banning of Russian energy

imports have been the first fracture line but there will be others. Europe is facing a rethink of its ideology, its priorities, and its policy framework. Jean Monnet famously wrote that "Europe will be forged in crises and will be the sum of the solutions adopted for those crises". We now understand that his prediction should be read literally.

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