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Željana M. Jovičić\*

Milko Štimac\*\*

# Ocjena uspješnosti projekata javno-privatnog partnerstva

## Performance assessment of public-private partnership projects

### Rezime

Javno-privatno partnerstvo je oblik saradnje javnog i privatnog sektora koji se realizuje udruživanjem resursa, kapitala i stručnih znanja, sa ciljem zadovoljenja obostranih interesa. Osnovni princip u procesu odlučivanja o uspostavljanju javno-privatnog partnerstva kao načina realizovanja projekata jeste mogućnost ostvarenja veće vrijednosti za novac, koja se postiže kroz efekte skraćivanja rokova, povećanja kvaliteta ili obima krajnjeg proizvoda, nižom cijenom, ali i prenosom dijela rizika sa javnog na privatnog partnera, odnosno finansijskim efektom te realokacije. Korišćenjem metode studije slučajeva iz prakse u Republici Srpskoj, dobijeni su rezultati koji pokazuju značajnu sumnju u uspješnost primjene ovog modela, posebno u osjetljivim djelatnostima (zdravstveni sektor). Kao osnovni uzroci neuspješnosti projekata javno-privatnog partnerstva identifikovani su: propusti u pripremnim fazama dodjele ugovora, predimenzioniranost postupaka i procedura, loša komunikacija i koordinacija između učesnika u procesu, nedovoljno razvijen sistem kontrole i zaštite javnog interesa, paušalne procjene ekonomskih parametara (posebno diskontne stope) u postupku pripreme i realizacije ovih projekata.

**Ključne riječi:** javno-privatno partnerstvo, koncesije, ugovori, isplativost.

### Abstract

Public-private partnership is a form of collaboration between the public and private sectors realized by combining resources, capital and expertise, with the aim of satisfying mutual interests. The basic principle in the decision-making process on establishing a public-private partnership as a way of implementing projects is the possibility of achieving greater value for money. This is achieved through the effects of deadline shortening, increasing the quality or range of the final product, lowering the cost, but also transferring some risk from public to private partners - that is, the financial effect of that reallocation. Using the method of case studies from practice in the Republic of Srpska, the results obtained show significant doubt in the success of the application of this model, especially in sensitive activities (health sector). The main causes of the failure of public-private partnership projects have been identified: failures in the preparatory stages of contract award; oversized procedures and procedures; poor communication and coordination between participants in the process; an insufficiently developed system of control and protection of public interest; flat estimates of economic parameters (especially discount rates) in the process of preparation and implementation of these projects.

**Keywords:** public-private partnership, concession, contracts, cost-effectiveness

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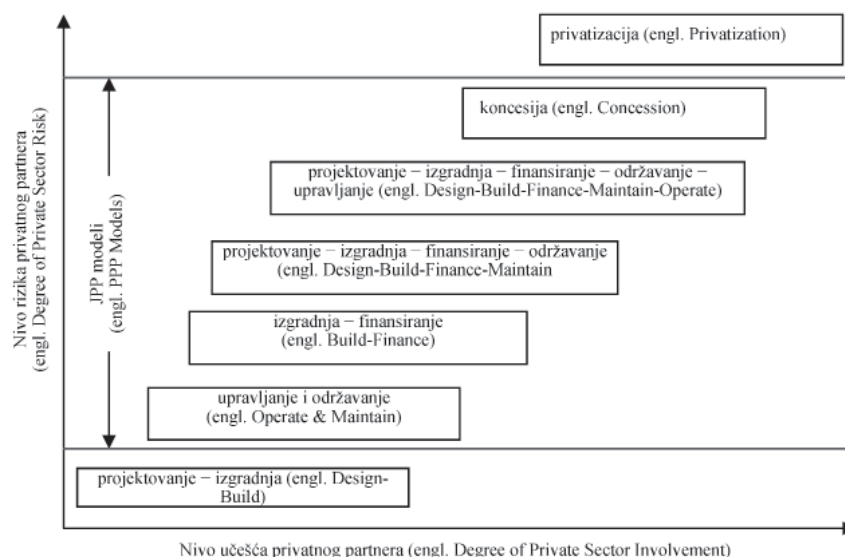
## UVOD

Ograničena sredstva javnog sektora i sve manja mogućnost zaduživanja za realizaciju novih investicija predstavljaju prvi razlog traženja novih izvora finansiranja javnih aktivnosti, ali i alternativnih načina da se one efikasno realizuju. Upravljanje svim aktivnostima u procesu uspostavljanja ravnoteže između javnog i privatnog sektora ima za cilj da otkloni slabosti i udruži prednosti ovih partnera, ali je ono uslovljeno brojnim ograničenjima. U upravljanju javno-privatnim partnerstvima, aktivnu ulogu imaju oba učesnika. Motivi i interesi za partnerstvo javnog i privatnog sektora nisu bili jednaki u prošlosti. Sa finansijskog aspekta, udruživanje javnog i privatnog subjekta izazvano je nedostatkom izvora finansiranja javnih rashoda, ali i potrebom za efikasnijom isporukom kvalitetnijih javnih dobara, u smislu ostvarenja veće „vrijednosti za novac“. U najširem smislu, javno-privatno partnerstvo je skup zajedničkih inicijativa javnog i privatnog profitnog i neprofitnog sektora, u kojim svaki subjekat mobilise određene resurse i učestvuje u planiranju i odlučivanju. U užem smislu, javno-privatno partnerstvo predstavlja kooperativne poduhvate u kojim javni i privatni sektor udružuju resurse i stručna znanja, kako bi, alokacijom tih resursa i rizika, zadovoljili neku javnu potrebu. Pritom, strateška dimenzija odnosi se na koordinaciju političkih ciljeva i određivanje uloga svakog partnera, a operativna na samu realizaciju projekta. U literaturi i praksi često se razmatra mogućnost primjene modela JPP u zavisnosti od toga da li se radi o novim investicijama ili o ulaganjima u postojeće projekte ili djelatnosti. Nove investicije smatraju se atraktivnim za strane ulagače, jer im omogućavaju kreativnost u uspostavljanju i razvoju poslovnog poduhvata (Hill, 2003). S druge strane, zemlje u razvoju raspolažu značajnom javnom imovinom i djelatnostima kojima loše i neefikasno upravljaju, što upućuje na zaključak da postojeći javni objekti, infrastruktura i djelatnosti mogu biti predmet isplative investicije, sprovedene po odgovarajućem modelu JPP.

## 1. PREGLED LITERATURE

U principima za upravljanje javno-privatnim partnerstvom koje preporučuje OECD (2012, str. 18), javno-privatno partnerstvo definiše se kao dugoročni ugovorni sporazum između vlade i privatnog partnera, po kojem privatni ostvaruje i obezbjeđuje finansiranje javnih usluga koristeći kapitalnu imovinu, uz raspodjelu pripadajućeg rizika.

**Slika 1.** Vrste JPP prema stepenu učešća privatnog sektora i riziku (obrada autora prema Livesey, 2014)



Zajednički projekti koji se realizuju po modelu JPP moraju zadovoljavati obostrane interese: uslov javnog partnera odnosi se na efikasno i efektivno postizanje ciljeva javnog, opšteg karaktera, a privatnog da u tom procesu ostvari zaradu. Uspjeh sporazuma zavisi od toga koliko ova dva cilja mogu da se usklade, a od visine očekivane dobiti zavisi da li privatni partner ima interes da prihvati veći dio rizika. Pritom, kao javni partner u zajedničkom projektu, vlada ili lokalna samouprava određuje količinu i kvalitet usluga koje očekuje od druge ugovorne strane. Prema obrazloženju pomenutog dokumenta OECD, mora se ostvariti povezanost osmišljavanja, izvođenja i održavanja kapitalnog dobra koje je predmet sporazuma, i to u periodu trajanja ugovora. Privatni partner za ove usluge može ostvariti svoju naknadu na dva načina: naplatom svojih potraživanja od javnog partnera, u vrijednosti i rokovima koji se unaprijed definišu, ili neposrednom naplatom od korisnika te javne usluge, odnosno javnog dobra. U izvjesnim slučajevima, moguća je i kombinacija ova dva načina. Prema istom dokumentu, javno-privatnim partnerstvom smatraju se koncesioni poslovi, ali samo oni kojima je cilj pružanje javnih usluga. Preciznije rečeno, koncesioni poslovi u kojima privatno preduzeće javnoj upravi (vladi) plaća za koncesiju (unaprijed, po jedinici predmeta koncesije, ili u kombinaciji ova dva načina), ali koji ne uključuju element javnosti i kojim se ne pružaju javne usluge, ne mogu se smatrati javno-privatnim partnerstvom. Takvi su, npr., poslovi zasnovani na koncesijama za eksploataciju mineralnih resursa. U takvim aranžmanima, vlada sa privatnim subjektom ugovara posao čiji predmet jeste javno dobro (minerali), ali cilj javne strane nije zadovoljenje javne potrebe (kako je to u modelu javno-privatnog partnerstva), nego povećanje budžetskih prihoda. Javna korist u ovim vrstama zajedničke ekonomske saradnje pojavljuje se samo posredno, po osnovu priliva sredstava od koncesione naknade u budžet, čijim trošenjem se, eventualno, može povećati finansiranje javnih potreba.

Početni oblik savremenih modela JPP pokrenuli su ugovori o kupovini energije koji su se razvili u SAD, osamdesetih godina prošlog vijeka, a u Evropi je njegova primjena počela sa privatizacijom industrije električne energije. Cilj ovih ugovora je bilo uvođenje konkurencije u energetske sektor i razvoj nezavisnih energetskih projekata, a specifična raspodjela rizika i visoko učešće dugoročnog duga u ukupnom finansiranju po ovom modelu omogućilo je razvoj tehnike poznate kao projektno finansiranje (Yescombe, 2000, str. 6).

Od tog perioda do danas, razvijene su (i taj proces se i dalje nastavlja) različite vrste i tipovi ugovora o poslovnoj saradnji koji suštinski određuju prirodu njihovih odnosa.

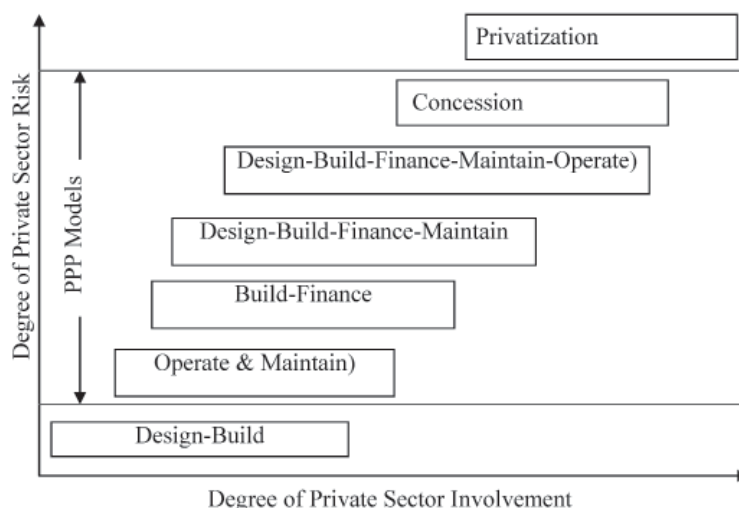
## INTRODUCTION

Limited funds of the public sector and the decreasing possibility of borrowing for the realization of new investments are the first reason for seeking new sources of financing public activities, but also for seeking alternative ways to implement them efficiently. Managing all the activities in the process of balancing the public and private sectors aims to address the weaknesses and combine the strengths of these partners, but this is subject to a number of limitations. In the management of public-private partnerships, both participants have an active role. Motives and interests for public-private partnerships have not been the same in the past. From a financial point of view, the association of public and private entities is caused by the lack of sources of financing public expenditures, but also by the need for a more efficient delivery of better-quality public goods, in terms of achieving greater “value for money”. In the broadest sense, a public-private partnership is a set of joint initiatives of the public and private for-profit and non-profit sectors, in which each entity mobilizes certain resources and participates in planning and decision-making. In a narrower sense, public-private partnerships are cooperative ventures in which the public and private sectors combine resources and expertise to meet a public need by allocating those resources and risks. In doing so, the strategic dimension refers to the coordination of political goals and determining the roles of each partner, and the operational dimension refers to the realization of the project. In the literature and practice, the possibility of applying the PPP model is often considered, depending on whether it is a new investment, or an investment in existing projects or activities. New investments are considered attractive to foreign investors because they allow them to be creative in establishing and developing a business venture (Hill, 2003). On the other hand, developing countries have significant public assets and activities that they manage poorly and inefficiently, which suggests that existing public facilities, infrastructure and activities could be subject to a profitable investment if it is carried out according to the appropriate PPP model.

## 1. LITERATURE REVIEW

In the principles for public-private partnership management recommended by the OECD (2012, p. 18), public-private partnership is defined as a long-term contractual agreement between the government and a private partner, according to which the private partner realizes and provides the financing of public services using capital assets, with a division of associated risk.

**Figure 1.** Types of PPP according to the degree of private sector participation and risk (author’s processing according to Livesey, 2014)



Joint projects implemented according to the PPP model must satisfy mutual interests: the condition of the public partner refers to the efficient and effective achievement of public, general and private goals to make money in the process. The success of the agreement depends on how well these two goals can be reconciled, and the amount of expected profit depends on whether the private partner has an interest in accepting most of the risk. In doing so, as a public partner in a joint project, the government or local government determines the quantity and quality of services it expects from the other contracting party.

According to the explanation of the aforementioned OECD document, the connection between the design, construction and maintenance of the capital asset (which is the subject of the agreement) must be achieved during the term of the contract. A private partner for these services can realize their compensation in two ways: by collecting their receivables from the public partner, according to the values and deadlines defined in advance, or by direct collection from the user of that public service, i.e. the public good. In some cases, a combination of these two methods is also possible. According to the same document, public-private partnerships are considered concession works, but only those aimed at providing public services.

More precisely, concession operations in which a private enterprise pays the public administration (government) for a concession (in advance, per unit of the concession object, or a combination of these two methods), but which does not include the public element and does not provide public services, cannot be considered a public-private partnership. Such are, for example, jobs based on concessions for the exploitation of mineral resources. In such arrangements, the government contracts with a private entity a business whose subject is a public good (minerals), but the goal of the public side is not to satisfy a public need (as in the public-private partnership model), but to increase budget revenues.

Public benefit in these types of joint economic cooperation appears only indirectly, based on the inflow of funds from the concession fee into the budget, the spending of which may eventually increase the financing of public needs.

The initial form of modern PPP models was initiated by energy purchase agreements that developed in the United States in the 1980s. In Europe, its application began with the privatization of the electricity industry. The aim of these agreements was to introduce competition in the energy sector and develop independent energy projects, and the specific distribution of risks and high share of long-term debt in total financing under this model enabled the development of a technique known as project financing (Yescombe, 2000, p. 6).

From that period until today, various types and types of business cooperation agreements have been developed (a process that continues today), which essentially determine the nature of their relations.



Može se zaključiti da se model JPP nalazi između dvije krajnosti, odnosno između organizacionog oblika proizvodnje javnih dobara samostalno izvedenih od strane javnog sektora i privatizacije. Prema ovom prikazu, outsorsing je prelazni organizacioni oblik, koji djelimično zadovoljava uslove koji su karakteristični za JPP, ali se ne smatra tipičnim modelom te vrste (outsorsing je kratkoročna saradnja, bez suštinskog učešća privatnog partnera u strateškom odlučivanju). S obzirom na ciljeve ovog rada, koji naglašava značaj i ulogu finansijskog menadžmenta u području donošenja investicionih odluka u javnom sektoru, istaknutu ulogu u postavljanju opšteg koncepta imaju autori iz užeg regiona, kao što su Mikerević, Ivanišević, Rodić, Sredojević, Orsag i Juričić. Njihovi radovi pomogli su u razumijevanju mnogih konkretnih problema u vezi s upravljanjem finansijama, posebno u dijelu koji se odnosi na uticaj i kontrolu rizika u poslovnim poduhvatima. Sličan doprinos istraživanjima ove vrste postignut je zahvaljujući i drugim autorima iz različitih zemalja, kao što su Van Horn (Van Horne), Grimzi i Luis (Gremsey, Luis), Delmon (Delmon), Akintoje i Blek (Akintoye, Black) i Smit i Merit (Smith, Merritt).

Uspješnost javno-privatnog partnerstva zavisi od kvaliteta ugovorom definisanih obaveza i prava, ali i spremnosti i mogućnosti da se tako određeni odnosi zadrže u toku trajanja projekta. Koliko je pitanje nedostataka ugovora ključno, između ostalog, i za razumijevanje ciljeva i mogućnosti saradnje između dva tradicionalno suprotstavljena sektora, pokazuje odluka Švedske kraljevske akademije nauka da Nobelovu nagradu za ekonomiju za 2016. godinu dodijeli autorima koji se aktivno bave problematikom koja je bliska temi ovog rada. Istražujući teorije ugovora, njihove posljedice i značaj, Hart i Holmstrom (Hart, Hölmstrom) dokazali su značaj sadržaja ugovora između različitih subjekata na tržištu. Suština teorije ugovora odnosi se na kontrolu pojedinačnih interesa u cilju zajedničkog posla. Prema Hartu (Hart, 1995), sprečavanje ispoljavanja nadmoći jednog subjekta nad drugim (a time i neproporcionalne podjele zarada) vrši se pregovaranjem. U suprotnom, subjekti koji su lišeni pravičnog učešća u zaradi odgovaraju na tu disproporciju smanjenjem ulaganja svojih resursa, što neminovno dovodi do pada produktivnosti.

## 2. MATERIJAL I ISTRAŽIVAČKE METODE

Uzimajući u obzir društvene ciljeve kao prioritetni zadatak poslovnih aktivnosti javnog sektora, procjena tih vrijednosti vrši se na osnovu sljedećih indikatora:

- realizovanje većeg broja projekata u odnosu na tradicionalni način isporuke javnih dobara;
- šira (geografska) pokrivenost područja isporuke javnih dobara, odnosno dostupnost javnih dobara većem broju korisnika;
- ostvarenje veće vrijednosti u odnosu na uložena sredstva, u odnosu na tradicionalni način isporuke javnih dobara (niži troškovi);
- isporuka kvalitetnijeg javnog dobra;
- ostvarivanje prihoda od komercijalizacije javnih dobara.

Prilikom izbora studije slučaja kao osnovne metode istraživanja definisanog predmeta i problema, presudnu ulogu imala je činjenica da se radi o malom broju slučajeva iz prakse, koji se, uz to, nalaze u ranim fazama implementacije. Istraživanjem su obuhvaćeni svi registrovani ugovori o koncesijama i javno-privatnom partnerstvu u Republici Srpskoj, odnosno projekti koji su realizovani (ili je njihova realizacija u toku), u periodu od usvajanja zakona koji regulišu te

oblasti. Za diskusiju su korišćeni rezultati prethodnih istraživanja drugih autora i zvanični podaci relevantnih institucija.

Projekti javno-privatnog partnerstva upisani u Registar ugovora o JPP u Republici Srpskoj, obrađeni kao studije slučajeva, jesu:

- (1) Izgradnja kanalizacione mreže i sistema za otpadne vode u Bijeljini;
- (2) Prodajni objekat – Gradska tržnica Lukavica;
- (3) Projekat izgradnje Vodenog parka Aquana u Banjoj Luci;
- (4) Projekat Andrićgrad u Opštini Višegrad;
- (5) Dijalizni centri u Republici Srpskoj (Banja Luka, Prijedor, Laktaši, Gradiška, Šamac, Doboj, Bijeljina, Zvornik i Istočno Sarajevo);
- (6) Projektovanje, izgradnja, opremanje i pružanje usluga u bolnici za kardiohirurgiju u Slatini;
- (7) Izgradnja i opremanje Centra za dijalizu u Trebinju;
- (8) Izgradnja i opremanje Centra za dijalizu u Foči;
- (9) Izgradnja nove luke Rača na teritoriji Opštine Bijeljina;
- (10) Poslovno-edukativni centar za pružanje usluga digitalne štampe;
- (11) Izgradnja sportske dvorane u Doboju;
- (12) Izgradnja postrojenja za separaciju čvrstog komunalnog otpada na regionalnoj sanitarnoj deponiji „Brijesnica“ u Bijeljini;
- (13) Projekat javno-privatnog partnerstva u izgradnji, finansiranju, korišćenju, održavanju i upravljanju dionicom auto-puta Doboj–Vukosavlje (dijela koridora Vc kroz Republiku Srpsku).

## 3. REZULTATI ISTRAŽIVANJA I DISKUSIJA

### 3.1. Problematika ocjene uspješnosti projekata javno-privatnog partnerstva

Određene prednosti primjene modela JPP nisu razlog da se odstupi od osnovnog pravila prilikom donošenja investicionih odluka, pri čemu se misli na zahtjev o dokazivanju isplativosti planiranog poduhvata. Javno-privatno partnerstvo je instrument finansiranja, način na koji se utiče na finansijsku konstrukciju projekta, ali se ne može poistovjetiti sa izvorom finansiranja. Ovo znači da se prednosti modela JPP u odnosu na tradicionalni način finansiranja dokazuju analizom troškova javnog sektora, odnosno komparatorom, kome prethodi postupak opšte isplativosti projekta. Drugim riječima, u toku životnog ciklusa projekta ima više ocjena isplativosti, koje se sprovode po različitim kriterijumima i primjenom više tehnika i metoda. Takođe, u postupku ocjene isplativosti, a u cilju održivosti projekta, posmatraju se i procjenjuju ne samo finansijski, nego i posredni indikatori koji utiču na isplativost, kao što je očekivani stepen zadovoljenja interesa pojedinačnih učesnika ili društva u cjelini.

Konkretizacija indikatora složenosti, troška i trajanja javno-privatnih poslovnih aranžmana, za razliku od prethodno navedenih, predstavlja relativno jednostavan zadatak. Predmet primjene modela JPP u realizaciji kapitalnih javnih investicija su složeni, finansijski zahtjevni projekti, za koje ne postoje jednostavna rješenja, zbog čega ni postupci koji ih prate ne mogu biti jednostavni, niti lišeni pratećih (često i neočekivano velikih) troškova.

Neadekvatna raspodjela rizika predstavlja jedan od najvećih problema i vrlo čest uzrok neuspješnih pokušaja implementacije ovog modela u manje razvijenim zemljama. Posljedice nekvalitetne raspodjele rizika, a time i narušavanje interesa jednog ili oba partnera,

It can be concluded that the PPP model is located between two extremes: between the organizational form of production of public goods independently performed by the public sector and privatization. According to this review, outsourcing is a transitional organizational form, which partially satisfies the conditions characteristic of PPP, but is not considered a typical model of that kind (outsourcing is short-term cooperation, without substantial participation of a private partner in strategic decision-making).

Given the objectives of this paper, which emphasizes the importance and role of financial management in the field of investment decisions in the public sector, a prominent role in setting the general concept has been taken by authors from the region such as Mikerevic, Ivanisevic, Rodic, Sredojevic, Orsag and Juričić. Their work has helped us understand many specific problems related to financial management, especially in the matter related to the impact and risk control in business ventures. A similar contribution to research of this kind has been made thanks to other authors from different countries, such as Van Horne, Gremsey and Luis, Delmon, Akintoye and Black, and Smith and Merritt.

The success of a public-private partnership depends on the quality of contractual obligations and rights, but also on the willingness and ability to maintain such relationships throughout the project. The decision of the Swedish Royal Academy of Sciences to award the 2016 Nobel Prize in Economics to authors who are actively involved in the subject of public private partnership shows just how crucial the issue of contract shortcomings is, among other things, for understanding the goals and possibilities of cooperation between two traditionally opposing sectors. By researching contract theories, their consequences and significance, Hart and Hölmstrom have proven the importance of the content of contracts between different market participants. The essence of contract theory refers to the control of individual interest in order to work together. According to Hart (Hart, 1995), preventing the manifestation of the superiority of one subject over another (and thus the disproportionate division of wages) is done through negotiation. Otherwise, entities deprived of equitable participation in earnings respond to this disproportion by reducing the investment of their resources, which inevitably leads to a decline in productivity.

## 2. MATERIALS AND RESEARCH METHODS

Taking into account social goals as a priority task of business activities of the public sector, the assessment of these values is done on the basis of the following indicators:

- Realization of a larger number of projects in relation to the traditional way of delivery of public goods;
- Wider (geographical) coverage of the area of delivery of public goods, i.e. availability of public goods to a larger number of users;
- Realization of higher value in relation to invested funds, in relation to the traditional way of delivery of public goods (lower costs);
- Delivery of better-quality public goods;
- Revenue from the commercialization of public goods.

When choosing a case study as the basic method of researching a defined subject and problem, a crucial role was played by the fact that it is a small number of cases from practice, which are also in the early stages of implementation. The research covers all registered contracts on concessions and public-private partnerships in the Republic of Srpska, ie projects that have been implemented (or are being implemented), in the period since the adoption of laws

governing these areas. The results of previous research by other authors and official data from relevant institutions were used for the discussion.

Public-private partnership projects entered in the Register of PPP Contracts in the Republic of Srpska, processed as case studies, are:

- (1) Construction of sewerage network and wastewater system in Bijeljina
- (2) Sales facility - Lukavica City Market
- (3) Construction project of the AQUANA Water Park in Banja Luka
- (4) Andrićgrad Project in the Municipality of Višegrad
- (5) Dialysis centres in Republika Srpska (Banja Luka, Prijedor, Laktasi, Gradiška, Šamac, Dobo, Bijeljina, Zvornik and East Sarajevo)
- (6) Design, construction, equipment and provision of services in the cardiac surgery hospital in Slatina
- (7) Construction and equipping of the Dialysis Centre in Trebinje
- (8) Construction and equipping of the Dialysis Centre in Foča
- (9) Construction of a new port of Rača on the territory of the Municipality of Bijeljina
- (10) Business-educational centre for providing digital printing services
- (11) Construction of a sports hall in Dobo
- (12) Construction of a plant for separation of solid municipal waste at the regional sanitary landfill "Brijesnica" in Bijeljina
- (13) Public-private partnership project in construction, financing, use, maintenance and management of the section of the highway Dobo - Vukosavlje (part of the corridor Vc through the Republic of Srpska).

## 3. RESEARCH RESULTS AND DISCUSSION

### 3.1. Problems of evaluating the success of public-private partnership projects

Certain advantages of applying the PPP model are not a reason to deviate from the basic rule when making investment decisions, by which we are referring to the requirement to prove the profitability of the planned venture. Public-private partnership is a financing instrument, a way of influencing the financial construction of a project, but it cannot be equated with the source of financing. This means that the advantages of the PPP model in relation to the traditional way of financing are proven by the analysis of public sector costs, ie the comparator, which is preceded by the procedure of analysing the general profitability of the project. In other words, there are several cost-effectiveness assessments during the life cycle of the project which are conducted according to different criteria and by applying various techniques and methods. Also, in the process of cost-effectiveness assessment, and in order to ensure the sustainability of the project, both financial and indirect indicators that affect cost-effectiveness are observed and evaluated, such as the expected degree of satisfaction of individual participants or society as a whole.

Concretizing the indicators of complexity, cost and duration of public-private business arrangements, in contrast to the above, is a relatively simple task. The subject of application of the PPP model in the realization of capital public investments are complex, financially demanding projects, for which there are no simple solutions, which

pokazuju se na više načina: prebacivanjem finansijskog tereta na krajnje korisnike, naknadnim povećanjima naknada koje plaća javni partner i sličnim negativnim pojavama. Prema formalnoj definiciji, rizici se prenose na onog učesnika koji ih može lakše kontrolisati i sa njima upravljati, ali praksa pokazuje da privatni partner često traži nerealno visoku nadoknadu za preuzimanje određenih rizika. Uspostavljanje ravnoteže interesa, na taj način, postiže se definisanjem kriterijuma za raspodjelu rizika i objektivnom procjenom uticaja njegove realokacije na jednog od partnera. Subjektivne procjene i nizak obuhvat društvenih konsekvenci mogu imati izrazito negativan uticaj ne samo na ugovorne strane nego i na korisnike javnog dobra, odnosno društvo u cjelini.

### 3.2. Koncesije u Republici Srpskoj

Zakon o koncesijama Republike Srpske („Službeni glasnik Republike Srpske“ br. 59/13. i 16/18, u nastavku teksta: Zakon o koncesijama) sadrži listu područja za koja koncesije mogu biti odobrene, a Vlada

**Tabela 1.** Naplaćene koncesione naknade u 2019. godini

Oblast koncesije	Iznos (KM)	Učešće
Mineralni resursi	10.244.646,25	29,21%
Energetika	20.526.825,91	58,53%
Poljoprivreda	1.214.722,94	3,46%
Izgradnja i korišćenje malih hidroelektrana	2.930.042,47	8,35%
Saobraćaj i veze	92.700,00	0,27%
Turizam	22.636,39	0,06%
Sportski ribolov	42.003,00	0,12%
Ukupno	35.073.576,96	100%

Izvor: Komisija za koncesije Republike Srpske (2019), kalkulacija autora

Prema podacima iz gornje tabele, finansijski efekti dodjele koncesija znatno su ispod očekivanih vrijednosti u odnosu na broj potpisanih ugovora, vrstu i vrijednost javnih dobara koji su predmet ugovora. U teoriji i praksi često se naglašava da je preduslov za efikasno funkcionisanje javno-privatnog partnerstva koje se ostvaruje putem koncesija veća direktna uključenost lokalnih zajednica, jer se prednosti realizacije koncesija od strane lokalnih vlasti ogledaju u jednostavnijem i bržem ugovaranju i boljoj kontroli kvaliteta realizacije poslova iz koncesionog ugovora (Grimsey, Lewis, 2005).

Prema Strukovnom pregledu o koncesijama i javno-privatnom partnerstvu u BiH, dokumentu koji je u obliku finalnog izvještaja javno dostupan, predmet koncesija u Bosni i Hercegovini najčešće je imovina lokalnih zajednica. Prednosti realizacije koncesija od strane lokalnih vlasti ogledaju se u jednostavnijem i bržem ugovaranju i boljem praćenju kvaliteta realizacije poslova iz koncesionog ugovora (Warner, 2014).

Rezultati ovog dijela istraživanja pokazuju brojne nepravilnosti u primjeni koncesionog modela u Republici Srpskoj, koje se prvenstveno odnose na propuste u pripremnim fazama dodjele koncesija, predimenzioniranih postupaka i procedura, lošu komunikaciju i koordinaciju između učesnika u procesu, nedovoljno razvijen sistem kontrole u toku realizacije ugovora i slično. Analizom prihoda od koncesionih naknada, zaključeno je da je njihov obim nezadovoljavajući, što je, između ostalog, posljedica pogrešne prakse prihvatanja samoinicijativnih ponuda, kada javni sektor donosi odluke od opšteg društvenog značaja na osnovu projekcija čije parametre ne provjerava.

Republike Srpske donosi odluku o dodjeli koncesija iz određene oblasti.

U periodu od 2004. do 2019. godine, zaključeno je ukupno 405 ugovora o koncesiji. U istom periodu, raskinuto je 75 ugovora, a za 43 ugovora istekao je period korišćenja koncesije.

U Zakonu o koncesijama, koncesione naknade (naknade novčanog karaktera) dijele se na:

- naknade za ustupljeno pravo, koje se plaćaju jednokratno pri zaključivanju ugovora o koncesiji, i
- koncesione naknade za korišćenje.

U slučaju da koncesiju dodjeljuje Vlada, koncesiona naknada za korišćenje dijeli se u određenom srazmjeru između Vlade i jedinice lokalne samouprave na čijoj teritoriji se obavlja koncesiona djelatnost. Pritom, učešće Vlade u prihodu ove vrste smanjuje se u odnosu na nivo (ne)razvijenosti jedinice lokalne samouprave.<sup>1</sup>

### 3.3. Ugovori o javno-privatnom partnerstvu u Republici Srpskoj

U Republici Srpskoj, najznačajnija pitanja iz oblasti javno-privatnog partnerstva, kao što su predmet, načela, načini, oblici i uslovi pod kojim se može ostvariti javno-privatno partnerstvo kao oblik udruživanja resursa, kapitala i stručnih znanja radi izgradnje, sanacije i održavanja infrastrukture, regulisana su Zakonom o javno-privatnom partnerstvu (u nastavku teksta: Zakon – vidi „Službeni glasnik Republike Srpske“ br. 59/09, 63/11, 68/20).

Ovi dokumenti potpuno su usklađeni sa preporukama Evropske komisije – Zelenom knjigom o javno-privatnom partnerstvu (vidi Commission of the European Communities, 2004) i Smjernicama za uspješna javno-privatna partnerstva (Commission of the European Communities, 2003).

Istraživanje u vezi s ocjenom uspješnosti projekata javno-privatnog partnerstva u Republici Srpskoj zasnovano je na sljedećim pretpostavkama:

- (1) U finansiranju infrastrukture treba koristiti model projektnog finansiranja;
- (2) Projekat mora biti ekonomski održiv po kriterijumima analize isplativosti;
- (3) Potcijenjena je složenost i trošak postupaka;
- (4) Model javno-privatnog partnerstva je dugoročan model, posebno u procesu pripreme i pregovaranja;

<sup>1</sup> Za koncesije koje dodjeljuje Vlada, podjela koncesione naknade za korišćenje između Vlade i jedinica lokalne samouprave vrši se prema proporciji: 30 : 70 za razvijene jedinice lokalne samouprave, 30 : 70 za srednje razvijene jedinice lokalne samouprave, 20 : 80 za nerazvijene jedinice lokalne samouprave i 10 : 90 za izrazito nerazvijene jedinice lokalne samouprave.



is why the procedures that follow them cannot be simple or devoid of accompanying (often unexpectedly large) costs.

Inadequate risk allocation is one of the biggest problems and a very common cause of unsuccessful attempts to implement this model in less developed countries. The consequences of poor risk allocation, and thus the violation of the interests of one or both partners, are shown in several ways: by shifting the financial burden to end users, subsequent increases in fees paid by the public partner and similar negative phenomena. According to the formal definition, risks are transferred to the participant who can more easily control and manage them, but practice shows that a private partner often seeks unrealistically high compensation for taking certain risks. Establishing a balance of interests, thus, is achieved by defining the criteria for risk allocation and objectively assessing the impact of its reallocation on one of the partners. Subjective assessments and low coverage of social consequences can have a very negative impact not only on the contracting parties, but also on the users of the public good, i.e. society as a whole.

### 3.2. Concessions in the Republic of Srpska

The Law on Concessions of the Republic of Srpska ("Official Gazette of the Republic of Srpska", No. 59/13 and 16/18, hereinafter: the

Law on Concessions) contains a list of areas for which concessions may be granted, and the Government of the Republic of Srpska makes a decision on award concession from a particular area.

In the period from 2004 to 2019, a total of 405 concession agreements were concluded. In the same period, 75 contracts were terminated, and the period of using the concession expired for 43 contracts.

In the Law on Concessions, concession fees (fees of a monetary nature) are divided into:

- fees for the assigned right, which is paid once when concluding the concession contract and
- concession fees for use.

In the event that the concession is granted by the Government, the concession fee for use is divided in a certain proportion between the Government and the local self-government unit on whose territory the concession activity is performed. At the same time, the share of the Government in the income of this type decreases in relation to the level of (under) development of the local self-government unit.<sup>1</sup>

**Table 1.** Concession fees collected in 2019

Concession Area	Amount (KM)	Participation
Mineral resources	10.244.646,25	29,21%
Energy	20.526.825,91	58,53%
Agriculture	1.214.722,94	3,46%
Construction and use of small hydropower plants	2.930.042,47	8,35%
Traffic and connections	92.700,00	0,27%
Tourism	22.636,39	0,06%
Sport Fishing	42.003,00	0,12%
Total	35.073.576,96	100%

Source: Commission for Concessions of the Republic of Srpska (2019), author's calculation

According to the data in the table above, the financial effects of the award of concessions are significantly below the expected values in relation to the number of signed contracts, the type and value of public goods that are the subject of the contracts. In theory and in practice, it is often emphasized that the precondition for the efficient functioning of public-private partnerships realized through concessions is greater direct involvement of local communities, because the advantages of concessions for local authorities are reflected in simpler and faster contracting and better-quality control of the realisation of the terms of the concession agreement (Grimsey & Lewis, 2005).

Based on the Expert Review on Concessions and Public-Private Partnerships in BiH, a document that is publicly available in the form of a final report, the subject of concessions in Bosnia and Herzegovina is most often the property of local communities. The advantages of the realization of concessions by local authorities are reflected in simpler and faster contracting and better monitoring of the quality of realization of works from the concession contract (Warner, 2014).

The results of this part of the research show numerous irregularities in the application of the concession model in the Republic of Srpska,

which primarily relate to omissions in the preparatory phases of concessions, oversized procedures and procedures, poor communication and coordination between process participants, insufficiently developed control system during contract implementation and similar. The analysis of revenues from concession fees concluded that their volume is unsatisfactory, which is, among other things, a consequence of the wrong practice of accepting self-initiated bids, when the public sector makes decisions of general social importance based on projections whose parameters it does not check.

### 3.3. Public-private partnership contracts in the Republic of Srpska

In the Republic of Srpska, the most important issues in the field of public-private partnership (such as the subject, principles, ways, forms and conditions under which public-private partnership can be achieved as a form of pooling resources, capital and expertise to build, rehabilitate and maintain infrastructure) are regulated by the Law on Public-Private Partnership (hereinafter: the Law - see the Official Gazette of the Republic of Srpska, No. 59/09, 63/11, 68/20).

These documents are fully in line with the European Commission's recommendations - the Green Paper on Public-Private Partnerships (see Commission of the European Communities, 2004) and the

<sup>1</sup> For concessions granted by the Government, the distribution of the concession fee for use between the Government and local self-government units is done according to the proportion:

- 30:70 for developed local self-government units,
- 30:70 for medium-developed local self-government units,
- 20: 80 for underdeveloped local self-government units and
- 10: 90 for extremely underdeveloped local self-government units.

- (5) Projekat mora biti strukturisan na način koji osigurava kvalitetno upravljanje i jak nadzor;
- (6) Potrebno je unaprijediti institucionalni i pravni okvir;
- (7) Ravnoteža interesa i raspodjela rizika pretpostavke su uspješnog projekta;
- (8) Javni sektor mora imati osiguran nadzor nad pruženim uslugama, a privatni partner pravnu sigurnost;
- (9) Ugovor o javno-privatnom partnerstvu ne može loš projekat pretvoriti u dobar.

**Slika 2. Povezanost pretpostavki i studija slučajeva (bez koncesija), kreacija autora**

Pretpostavka	Studija slučaja (identifikovana brojem)													Ukupno
	1	2	3	4	5	6	7	8	9	10	11	12	13	
H1				●										1
H2											●	●		2
H3			●	●	●	●	●	●	●		●		●	9
H4						●	●	●		●			●	5
H5	●				●									2
H6	●	●	●	●	●	●	●	●	●	●	●	●	●	13
H7					●								●	2
H8					●		●	●						3
H9											●			1
Ukupno	2	1	2	3	5	3	4	4	2	1	4	2	4	

Kako se većina projekata javno-privatnog partnerstva u Republici Srpskoj nalazi u početnim fazama, poređenjem sličnih istraživanja u zemljama u okruženju dolazi se do zaključka da opšti društveno-ekonomski ambijent utiče na stepen uspješnosti saradnje između javnog i privatnog sektora (Cvijović, 2015; Benković et al., 2012; Benković et al., 2011). U svojoj monografiji, Sredojević (2010) daje pregled stanja i brojne studije slučajeva iz zemalja Jugoistočne Evrope i navodi da je za dalji razvoj ovog instrumenta finansiranja javnih potreba potrebno unaprijediti kapacitete oba sektora.

Od svih zemalja iz okruženja, Republika Hrvatska ima najrazvijenije tržište JPP i najduže iskustvo u njegovoj primjeni. U poređenju sa hrvatskim iskustvom, rezultati dobijeni ovim istraživanjem nemaju značajnijih odstupanja kada su u pitanju potreba za unapređenjem opšteg ambijenta za uspješnu primjenu modela JPP i preporuka za korišćenje projektnog finansiranja (vidi Alduk, Marenjak, 2014; Jarkas, Marenjak, 2014).

U primjerima koji se odnose na primjenu modela javno-privatnog partnerstva u zdravstvenoj djelatnosti, korišćena su iskustva i istraživanja sprovedena u zemljama u okruženju (vidi Ostojić et al., 2012; Damjanović et al., 2010) i u Velikoj Britaniji (Grimsey, Lewis, 2004). Primjećuje se da su rezultati istraživanja i uočeni problemi relativno slični u razvijenim zemljama (Velika Britanija) i u zemljama sa oskudnim iskustvom u primjeni javno-privatnog partnerstva i slabijom ekonomijom (Republika Srpska, Hrvatska i Srbija). Kao i u drugim zemljama regiona (Crna Gora, Rumunija, Albanija, djelimično i Republika Srpska), javno-privatna partnerstva u zdravstvu dio su širih razvojnih strategija, od kojih se kao rezultat očekuje povećana efikasnost i racionalnije alociranje resursa.

Izrada komparatora troškova javnog sektora, kao alternativnog, hipotetičkog modela jeste zakonom definisana obaveza u izradi studije izvodljivosti za projekte javno-privatnog partnerstva. To je dokument koji sadrži komparaciju sadašnjih vrijednosti ukupnih životnih troškova u ugovornom periodu projekta po tradicionalnom (budžetskom) modelu finansiranja u odnosu na model javno-privatnog partnerstva, a uključuje definisanje nosilaca rizika, kao i njihovo vrednovanje. Komparator javnog sektora jeste projektovani trošak

javnog sektora, korigovan za rizike i konkurentsku neutralnost. Da bi taj podatak bio uporediv sa drugom opcijom (po modelu javno-privatnog partnerstva) i prilagođen vremenskoj dimenziji novca, koristi se metoda diskontovanja. Imajući u vidu uticaj diskontne stope na sadašnju vrijednost (a time i na isplativost), načini određivanja njene visine i posljedice tog izbora od izuzetne su važnosti za procjenu isplativosti. Analiza projekata koji su obuhvaćeni ovim istraživanjem pokazuje da je najčešće korišćena diskontna stopa od 8%, bez obrazloženja načina njenog određivanja. Ova stopa se u razvijenim državama kreće u intervalu od 1% do 6%, a u Republici Srbiji je određena na nivou od 4,5%. Državna agencija periodično objavljuje i premiju za rizik na ulaganje u Republiku Srbiju, čija se vrijednost kreće oko 7%.

U razvijenim zemljama, kao što je Velika Britanija, izvršene su korekcije u smislu određivanja preporučene diskontne stope i ona je definisana na nivou od 3,5%. Takođe, zbog činjenice da se rizici kojima je izložen javni sektor manje odnose na njenu mogućnost zaduživanja (jer se smatra da je država gotovo bezrizičan zajmoprimac), a više na rizike koji se pojavljuju u toku realizovanja projekta, preporučen je postupak ocjene individualnih rizika za svaku opciju posebno (Grimsey, Lewis, 2004, str. 139).

Osnovni princip u procesu odlučivanja o uspostavljanju JPP kao načina realizovanja projekta jeste mogućnost ostvarenja veće vrijednosti za novac u odnosu na tradicionalne javne nabavke. Veća vrijednost za novac postiže se kroz efekte skraćivanja rokova, povećanjem kvaliteta ili obima krajnjeg proizvoda/usluge, nižom cijenom proizvoda/usluge, ali i prenosom dijela rizika sa javnog na privatnog partnera, odnosno finansijskim efektom te preraspodjele. Formalno, u svim posmatranim slučajevima iz prakse, izuzev jednog, dokazana je ekonomska isplativost planiranih projekata. Međutim, analizom je utvrđeno da se u velikom broju slučajeva radi o nerealnim i paušalnim procjenama podataka korišćenim za potrebe izrade studija, zbog čega postoji određena sumnja u ispravnost odluke o izboru modela javno-privatnog partnerstva kao najpogodnije alternative. Može se pretpostaviti da će posljedice takvih odluka, posebno u dužem roku, imati negativne efekte na uspješnost pokrenutih projekata.

Guidelines for Successful Public-Private Partnerships (Commission of the European Communities, 2003).

The research regarding the evaluation of the success of public-private partnership projects in the Republic of Srpska is based on the following assumptions:

- (1) The project financing model should be used in infrastructure financing
- (2) The project must be economically viable according to the criteria of cost-effectiveness analysis
- (3) The complexity and cost of the proceedings is underestimated

- (4) The public-private partnership model is a long-term model, especially in the process of preparation and negotiation
- (5) The project must be structured in a way that ensures quality management and strong supervision
- (6) The institutional and legal framework needs to be improved
- (7) The balance of interests and risk allocation is a prerequisite for a successful project
- (8) The public sector must have oversight of the services provided, and the private partner must have legal certainty
- (9) A public-private partnership agreement cannot turn a bad project into a good one.

**Figure 2.** Relationship between assumptions and case studies (without concessions), author's creation

Presumption	Case study (identified by number)													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	
H1				•										1
H2											•	•		2
H3			•	•	•	•	•	•	•		•		•	9
H4						•	•	•		•			•	5
H5	•				•									2
H6	•	•	•	•	•	•	•	•	•	•	•	•	•	13
H7					•								•	2
H8					•		•	•						3
H9											•			1
Total	2	1	2	3	5	3	4	4	2	1	4	2	4	

As most public-private partnership projects in the Republic of Srpska are in the initial stages, a comparison of similar research in the surrounding countries leads to the conclusion that the general socio-economic environment affects the degree of success of cooperation between the public and private sector (Cvijović, 2015; Benković et al., 2012; Benković et al., 2011). In his monograph, Sredojević (Sredojević, 2010) gives an overview of the situation and numerous case studies from the countries of Southeast Europe and states that for the further development of this instrument of financing public needs, it is necessary to improve the capacities of both sectors.

Of all the surrounding countries, the Republic of Croatia has the most developed PPP market and the longest experience in its application. Compared to the Croatian experience, the results obtained by this research do not differ significantly when it comes to the need to improve the general environment for the successful implementation of the PPP model and recommendations for the use of project financing (see Alduk & Marenjak, 2014; Jarkas & Marenjak, 2014).

In the examples related to the application of the public-private partnership model in health care, experiences and research conducted in the surrounding countries (see Ostojić et al., 2012; Damjanović et al., 2010) and in Great Britain (Grimsey & Lewis, 2004) were used. It is noted that the results of the research and the observed problems are relatively similar in developed countries (UK) and in countries with little experience in implementing public-private partnerships and weaker economies (Republic of Srpska, Croatia and Serbia). As in other countries in the region (Montenegro, Romania, Albania, and in part the Republic of Srpska), public-private partnerships in healthcare are part of some broader development strategies, which are expected to result in increased efficiency and more rational resource allocation.

The development of a public sector cost comparator, as an alternative, hypothetical model, is a legally defined obligation in the

preparation of a feasibility study for public-private partnership projects. It is a document that contains a comparison of the current values of total living costs in the contract period of the project according to the traditional (budget) financing model in relation to the model of public-private partnership, and includes the definition of risk bearers and their evaluation. The public sector comparator is the projected public sector cost, adjusted for risks and competitive neutrality. In order for this data to be comparable to the second option (according to the model of public-private partnership) and adjusted to the time dimension of money, the discounting method is used. Given the impact of the discount rate on present value (and thus on cost-effectiveness), the ways in which its amount is determined and the consequences of that choice are extremely important for assessing cost-effectiveness. The analysis of the projects included in this research shows that the most commonly used discount rate is 8%, with no explanation on how to determine it. This rate in developed countries ranges from 1% to 6%, and in the Republic of Serbia it is set at 4.5%. The state agency periodically announces a premium for the risk of investing in the Republic of Serbia, the value of which is around 7%.

In developed countries, such as the United Kingdom, adjustments have been made in terms of determining the recommended discount rate and it is defined at the level of 3.5%. Also, due to the fact that the risks to which the public sector is exposed are less related to its ability to borrow (because it is considered that the state is an almost risk-free borrower), and more to the risks that arise during project implementation, an individual risk assessment procedure is recommended for each option in particular (Grimsey & Lewis, 2004, p. 139).

The basic principle in the decision-making process on the establishment of PPP as a way of project implementation is the possibility of achieving greater value for money compared to traditional public



## ZAKLJUČAK

Projekti koji se finansiraju i realizuju modelom javno-privatnog partnerstva, po svojoj sadržini, trajanju, vrijednosti i specifičnosti, predstavljaju jedan od najsloženijih ekonomskih poduhvata na nekom tržištu. Oni podrazumijevaju prethodno osmišljavanje, precizno analiziranje, planiranje, finansiranje, operativno izvođenje, a kod nekih projekata i kasnije održavanje. Zajednički projekti koji se realizuju po modelu javno-privatnog partnerstva moraju zadovoljavati obostrane interese: uslov javnog partnera se odnosi na efikasno i efektivno postizanje ciljeva javnog, opšteg karaktera, a privatnog da u tom procesu ostvari zaradu. Rezultati ovog istraživanja pokazuju brojne nepravilnosti u primjeni koncesionog modela u Republici Srpskoj, koje se prvenstveno odnose na propuste u pripremnim fazama dodjele koncesija, predimenzioniranih postupaka i procedura, lošu komunikaciju i koordinaciju između učesnika u procesu, nedovoljno razvijen sistem kontrole u toku realizacije ugovora i slično. Analiza prihoda od koncesionih naknada pokazuje da je njihov obim nezadovoljavajući, što je, između ostalog, posljedica pogrešne prakse prihvatanja samoinicijativnih ponuda, kada javni sektor donosi odluke od opšteg društvenog značaja na osnovu projekcija čije parametre ne provjerava. Studije posmatranih slučajeva iz prakse u Republici Srpskoj pokazuju značajne nedostatke u primjeni ovog modela. Ambiciozno postavljen pravni okvir nije adekvatno primijenjen, što je uzrok produženja rokova realizacije pojedinih aktivnosti projekata i ugrožavanje javnog interesa zbog gubitka kontrole i lošeg monitoringa. Formalno, u svim posmatranim slučajevima iz prakse, izuzev jednog, dokazana je ekonomska isplativost planiranih projekata. Međutim, utvrđeno je da se u velikom broju slučajeva radi o nerealnim i paušalnim procjenama podataka, korišćenim samo za potrebe izrade obavezne dokumentacije u procesu ugovaranja. Relativno mali broj slučajeva iz prakse (koji se, uz to, nalaze u ranim fazama implementacije i nisu jednoobrazni ni po vrsti djelatnosti niti po obliku primijenjenog modela), kao i nedostupnost sadržaja elaborata, ugovora i studija, predstavljali su značajno ograničenje ovog istraživanja. I pored toga, rezultati nedvosmisleno pokazuju da i država, posebno u ulozu investitora, treba da se ponaša i djeluje kao poslovni subjekt, bez opasnosti od ugrožavanja njene socijalne uloge u društvu. Naprotiv, sa prihvatanjem teorijskih i praktičnih postavki finansijskog menadžmenta, ona će donositi strateške finansijske odluke koje doprinose kvalitetu svih aspekata ekonomskog i društvenog ambijenta.

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procurement. Higher value for money is achieved through the effects of shortening deadlines, increasing the quality or volume of the final product / service, lower price of the product / service, but also by transferring part of the risk from public to private partners, i.e. the financial effect of redistribution. Formally, in all observed cases from practice, except one, the economic viability of the planned projects was proven. However, the analysis found that in a large number of cases these are unrealistic and lump sum estimates of data used for the purposes of the study, which is why there is some doubt about the correctness of the decision to choose a public-private partnership model as the most suitable alternative. It can be assumed that the consequences of such decisions, especially in the long run, will have negative effects on the success of the launched projects.

## CONCLUSION

Projects that are financed and implemented by the model of public-private partnership, in terms of their content, duration, value and specificity, represent one of the most complex economic ventures in a market. They include pre-design, precise analysis, planning, financing, operational execution, and, in some projects, subsequent maintenance. Joint projects implemented according to the model of public-private partnership must satisfy mutual interests: the condition of the public partner refers to the efficient and effective achievement of goals of public, general character, and the private partner requires to make money in that process. The results of this research show numerous irregularities in the application of the concession model in the Republic of Srpska, which primarily relate to omissions in the preparatory phases of concessions, oversized procedures and procedures, poor communication and coordination between participants in the process, underdeveloped control system during contract implementation and the like. The analysis of revenues from concession fees shows that their volume is unsatisfactory, which is, among other things, a consequence of the wrong practice of accepting self-initiated bids, when the public sector makes decisions of general social importance based on projections whose parameters it does not check. Studies of observed cases from practice in the Republika Srpska show significant shortcomings in the application of this model. The ambitious legal framework has not been adequately implemented, which is the reason for the extension of deadlines for the implementation of certain project activities and endangering the public interest due to the loss of control and poor monitoring. Formally, in all observed cases from practice, except one, the economic viability of the planned projects was proven. However, it was found that in a large number of cases these are unrealistic and lump sum estimates of data, used only for the purpose of preparing mandatory documentation in the contracting process. The relatively small number of practical cases (which, moreover, are in the early stages of implementation and are not uniform in type of activity or in the form of applied model), as well as the unavailability of studies, contracts and studies, were a significant limitation of this research. Nevertheless, the results unequivocally show that the state, especially in the role of investors, should behave and act as a business entity, without the danger of jeopardizing its social role in society. On the contrary, by accepting the theoretical and practical assumptions of financial management, it will make strategic financial decisions that contribute to the quality of all aspects of the economic and social environment.

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# Mjesto i uloga industrije osiguranja u ekonomskom razvoju Bosne i Hercegovine

## Place and role of insurance industry in economic development of Bosnia and Herzegovina

### Rezime

Industrija i djelatnost osiguranja imaju značajno mjesto u ekonomskom razvoju svake zemlje. To vrijedi i za Bosnu i Hercegovinu. Postoji međusobna korelacija srazmjernog karaktera između stepena ekonomske razvijenosti zemlje i razvijenosti industrije i djelatnosti osiguranja. U 2019. godini, premija osiguranja u cijelom svijetu bila je 6 biliona 292 milijarde i 600 miliona USD. Tako velika količina novca, samo po osnovu premije, daje za pravo da se osiguravajuća društva smatraju jednim od najvećih institucionalnih investitora na svijetu.

Tri su osnovne funkcije osiguranja: funkcija zaštite, funkcija mobilizacije i akumulacije finansijskih sredstava i društveno-ekonomska (socijalna) funkcija. Na osnovu zvaničnih podataka, prezentiraju se komparativni pokazatelji razvijenosti finansijskih tržišta i finansijske pozicije industrije osiguranja u svijetu, balkanskoj regiji i Bosni i Hercegovini. Pored niza prezentiranih podataka, posebno su zanimljivi odnosi premija po stanovniku i učešće u BDP-a u EU27 i BiH. U 2019. godini premija po stanovniku EU27 bila je 2.122 eura, a u BiH 112. U istoj godini, udio premije u BDP za EU27 je 6,81%, a u BiH 2,19%. Ovi pokazatelji dovoljno govore o snazi industrije osiguranja u ekonomskom razvoju Bosne i Hercegovine.

Pandemija COVID-19 novi je sistemski rizik i velika kompleksna prijetnja. Naslov ovog rada se fokusira na uticaj aktuelne pandemije na industriju osiguranja i ekonomski razvoj. Prema Allianzovom barometru rizika za 2021. godinu (Allianz Global Corporate & Specialty – AGCS), bolest uzrokovana virusom korona u 2020. godini je u samom vrhu svjetskih poslovnih rizika i istovremeno negativno utiče na ostale vodeće poslovne rizike u svijetu. Na taj način direktno utiče i na industriju osiguranja i ekonomski razvoj.

**Ključne riječi:** industrija osiguranja, rizici, ekonomija, finansije, socio-ekonomska kriza, Bosna i Hercegovina.

### Abstract

Insurance industry and insurance activity have a significant place in the economic development of any country. It is true of Bosnia and Herzegovina as well. There is a mutual correlation of proportionate character between the degree of country's economic development and the development of the insurance industry and activity. In 2019, insurance premium in the whole world amounted to 6 trillion 292 billion and 600 million USD. Thus, a large amount of money, only based on premium, is a good reason for insurance companies to be considered as some of the greatest institutional investors in the world.

Insurance has three basic functions: the function of protection, the function of mobilization and accumulation of financial resources, and the socio-economic (social security) function. Based on the official data, the paper presents comparative indicators of the development of financial markets and financial position of the insurance industry in the world, Balkan region, and Bosnia and Herzegovina. Besides a series of presented data, a particular interest is attached to the ratios of premium per capita to the share in GDP in EU27 and BiH. In 2019, EU27 premium per capita amounted to 2,122 euro, while in BiH it amounted to 112. In the same year, the share of premium in GDP was 6.81% for EU27 and 2.19% for BiH. These indicators are sufficient evidence of the power of insurance industry in the economic development of Bosnia and Herzegovina.

COVID-19 pandemic is a new systematic risk and a big and complex threat. The title of the paper focuses on the impact of the current pandemic on the insurance industry and the economic development. According to Allianz Risk Barometer for (Allianz Global Corporate & Specialty – AGCS) in 2020, the disease caused by coronavirus is in the very top of global business risks and, at the same time, adversely affects other leading business risks in the world. In this way, it also directly affects the insurance industry and the economic development.

**Keywords:** insurance industry, risks, economy, finance, socio-economic crisis, Bosnia and Herzegovina.

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## UVOD

Industrija osiguranja predstavlja vrlo značajnu ekonomsku, finansijsku i razvojnu polugu ukupnog socio-ekonomskog razvoja i rasta, na globalnom, regionalnom i lokalnom planu. Kroz historiju i za sva vremena je ova privredna djelatnost imala, ima i imaće veoma važnu ulogu u navedenim oblastima, budući da je u svim vremenima bio, jeste i bit će prisutan rizik (rizici) sa svojim višestrukim djelovanjima na ekonomiju, finansije, na ljudsku zajednicu i pojedinca, a osiguranje postoji jer postoji rizik. Rizik je događaj koji svakim danom postaje sve rašireniji, složeniji, dobija nove sadržaje i oblike, multiplicira se i traži sve više energije i znanja da se identifikira, okarakterizira, adekvatno njime upravlja. Rizicima se na primjeren način upravlja kako materijalnim, finansijskim, fizičkim sredstvima, tako i nematerijalnim, nefinansijskim, duhovnim načinima. Iz svega ovoga izrasla je, u koninuiranom trendu, industrija osiguranja. Kao i sve industrije, industrija osiguranja ima svoje institucije, proizvode, interesne grupe, pravna određenja, društvene i finansijske efekte.

Misija osiguranja jeste proizvodnja materijalne i duhovne sigurnosti fizičkih i pravnih lica u određenom vremenskom periodu i na određenom geografskom prostoru. Vizija osiguranja jeste pravovremena i što cjelovitija identifikacija što većeg broja rizika, aktivno upravljanje njima, uz pozitivne sinergetske efekte za osiguranika, odnosno korisnika osiguranja.

U posljednjih 5000 godina postoje pisani tragovi o rizicima i osiguranju. Prije 3000 godina prije nove ere, u Kini su ostavljeni pisani tragovi o ovome. Od emotivnog do racionalnog, od nenaučnog do naučnog kretale su se spoznaje kvantitativnog rasta i kvalitativnog razvoja djelatnosti, a kasnije i industrije osiguranja. Na tom historijskom putu došlo se do nepobitne naučne istine da je osiguranje multidisciplinarna oblast kojoj primjereno trebaju sva naučna i praktična dostignuća kako bi mogla odgovoriti svojoj misiji i viziji.

Fizičari su davno izrekli istinu: ne postoji perpetuum mobile. Ekonomisti ističu: nema „besplatnog ručka“. Prostim uličnim riječnikom mogli bismo reći: nema ništa džaba! Dakle, ni djelatnost osiguranja ne može biti besplatna. Naučnicima i stručnjacima iz oblasti osiguranja dobro je poznat „put novca u osiguranju“. Međutim, neprekidno se istražuju novi sadržaji i načini finansijskog menadžmenta u osiguranju, uz uvažavanje svih dosadašnjih naučnih istina.

Novčani tok u osiguranju, pojavno od ugovorene, naplative i naplaćene premije, preko upravljanja, finansijskog menadžmenta privremeno slobodnih novčanih sredstava do, na koncu, isplate ugovorene, osigurane sume novca na ime ostvarenog rizika ili osiguranog događaja traži visokostručna znanja iz ove oblasti. Ovo je imperativno potreban proces primijenjenog znanja, obavezno utemeljen na naučnim istinama, ali nije i dovoljan. Zahtjev dovoljnosti nalazi se u procesima koji nisu „na prvi pogled“ javnosti: u procesima složenog postupka izračuna neto i bruto premije, te njihovih sastavnica (prvenstveno režijskih troškova, preventive i sl.), zatim posebno osjetljivih procesa finansijskog menadžmenta kod upravljanja investicionim portfoliom osiguravajućeg društva i očuvanja dijalektičkih relacija likvidnosti i solventnosti, na jednoj strani, i profitabilnosti, na drugoj strani poslovnog imperativa i umješnosti povezanih poslovnih operacija. Ovim potrebnim i dovoljnim procesima, poslovnim uvjetima, sintetički iskazanim, treba dodati i nekonačan broj analitičkih sastavnica koji, na koncu, tek svi ujedinjeni daju rezultantu ukupnog novčanog toka u djelatnosti (re)osiguravajućih društava. Samo se uvjetno ovaj kontinuirani integralni novčani tok u djelatnosti (re)osiguravajućih društava može fragmentarno podijeliti na tri dijela: (a) izračun visine premije (neto,

bruto i njihovih sastavnica) i načini njene efektivne naplate; (b) direktni finansijski menadžment, upravljanje investicionim portfoliom privremeno slobodnih novčanih sredstava; i (c) upravljanje procesima isplate ugovorenog osiguravajućeg iznosa korisniku osiguranja. Izračun visine premije i načini njene efektivne naplate spadaju u direktnu oblast aktuaristike (eksplicitno aktuarske matematike), a sa stajališta novčanog toka to je priliv novčanih sredstava na račun (re)osiguravajućeg društva.

Upravljanje investicionim portfoliom privremeno slobodnih novčanih sredstava koja su došla na račun (re)osiguravajućeg društva po osnovu naplaćene neto premije znači posebno kompleksan i ekspertan način direktnog finansijskog menadžmenta u osiguranju. Dodatnu kompleksnost i ekspertnost traži poslovanje u uslovima krize. Za takve uslove poslovanja potrebna su dodatna znanja i vještine. Sa stajališta novčanog toka, u ovom segmentu, imamo vrlo često višekratne prilive i odlive pojedinačnih i posebnih novčanih sredstava koji bi trebalo da imaju (uvijek) pozitivan saldo. Kako postići da taj saldo prvo odliva, a onda priliva kod plasiranja privremeno slobodnih novčanih sredstava ima zadovoljavajuću i moguću pozitivnu vrijednost? Za takav ishod ovog novčanog toka potrebno je specijalizirano znanje koje je predmetom permanentne nadogradnje.

Proces isplate ugovorenog osiguravajućeg iznosa korisniku osiguranja jeste završni cilj obligacije, ali ne mora biti i konačan završetak obligacionog odnosa. I ovdje treba biti prikladni finansijski menadžment. I ovdje treba biti prisutna na djelu i aktuaristika, i poslovnost, i samoodrživost (re)osiguravajućeg društva, i marketing, i nastavak izgradnje reputacije, kako osiguravatelja, tako i djelatnosti osiguranja. Može se reći: ovo je posebna tema koja traži posebnu elaboraciju.

Navedena tri, samo uvjetno fragmentirana, dijela finansijskog menadžmenta u osiguranju u poslovnom procesu osiguravatelja su integrirana i predstavljaju jednu cjelinu uvezanu korelativnim vezama uzročno-posljedične naravi.

Temeljna načela poslovanja konvencionalnog korporativnog osiguravatelja, (re)osiguravajućeg društva, jesu: sigurnost, likvidnost i profitabilnost. Ova su načela početak, tok i završetak svih poslovnih operacija u djelatnosti i industriji osiguranja. Ove tri odrednice: sigurnost, likvidnost i profitabilnost sintetički se očituju u kategoriji solventnosti koja je *conditio sine qua non* u djelatnosti osiguranja. Zato je u osnovi efikasnog upravljanja rizikom (rizicima) obezbjeđenje solventnosti (re)osiguravatelja.

U industriji osiguranja, životna i neživotna osiguranja imaju svoje zajedničke i posebne karakteristike. Ovo se odnosi i na finansijski aspekt i finansijski menadžment u osiguranju. Zato se posebno prezentiraju modeli ocjene solventnosti u neživotnim i životnim osiguranjima. Dosljedna primjena aktuelnih odredbi solventnosti treba ujedno značiti ostvarivanje temeljnih načela poslovanja osiguravatelja, posebno sigurnosti i likvidnosti. Stepent profitabilnosti je, ipak, u domeni finansijskog menadžmenta. Ali, sve se ovo mora promatrati integralno i neraskidivo korelativno.

Djelatnost i industrija osiguranja ima esencijalni značaj za svakog pojedinca, svaku fizičku i pravnu osobu, socijalne skupine (bez obzira na njihovu veličinu, suštinu i formu), društvo u cjelini, kompletan privredni značaj. „Tvornica“, „fabrika“ te industrije je (re)osiguravajuće društvo, koje treba (mora) proizvoditi sigurnost putem svojih proizvoda. Zbog svojih finansijskih efekata, (re)osiguravajuća društva se s pravom nazivaju jednim od najznačajnijih institucionalnih investitora. Kao dokaz toga dajemo nekoliko statističkih pokazatelja (izvor: Bosna reosiguranje, mart 2021):

## INTRODUCTION

The insurance industry represents a very significant economic, financial and developmental lever of overall socio-economic development and growth, globally, regionally and locally. Throughout history and for all times, this economic activity has had, has and will have a very important role in these areas, since at all times it was, is and will be present risk (risks) with its multiple effects on the economy, finance, human community and individual, and insurance exists because there is risk. Risk is an event that becomes more widespread, more complex, acquires new contents and forms, multiplies and requires more and more energy and knowledge to identify, characterize, and adequately manage it. Risks are adequately managed, both materially, financially, physically, as well as intangibly, non-financially, spiritually. From all this, the insurance industry has grown, in a continuous trend. Like all industries, the insurance industry has its institutions, products, interest groups, legal determinations, social and financial effects.

The mission is to ensure the production of material and spiritual security of individuals and legal entities in a certain period of time and in a certain geographical area. The vision of insurance is timely and complete identification of as many risks as possible, active management with positive synergetic effects for the insured, ie the insurance beneficiary.

In the last 5,000 years, there have been written traces of risks and insurance. 3000 years ago, written traces of this were left in China. From the emotional to the rational, from the unscientific to the scientific, the insights of quantitative growth and qualitative development of the activity, and later also of the insurance industry, moved. On this historical path, the undeniable scientific truth has emerged that insurance is a multidisciplinary field that adequately needs all scientific and practical achievements in order to be able to fulfill its mission and vision.

Physicists have long since told the truth: there is no perpetuum mobile. Economists point out: there is no "free lunch". In simple street vocabulary we could say: there is nothing for free! Thus, the insurance business cannot be free either. Scientists and experts in the field of insurance are well aware of the "path of money in insurance". However, new contents and ways of financial management in insurance are constantly being researched, while respecting all previous scientific truths.

Cash flow in insurance, from the agreed, collectible and collected premium, through management, financial management of temporarily free funds to, finally, payment of the agreed, insured amount of money in the name of realized risk or insured event requires highly professional knowledge in this field. This is an imperatively necessary process of applied knowledge, necessarily based on scientific truths, but it is not enough. The requirement of sufficiency is found in processes that are not "at first glance" appearing to the public: in the processes of complex calculations of net and gross premiums, and their components (primarily overheads, prevention, etc.), then particularly sensitive financial management activities in investment portfolio management and preserving the dialectical relations of liquidity and solvency, on the one hand, and profitability, on the other hand, the business imperative and the skill of related business operations. To these necessary and sufficient processes, business conditions, synthetically expressed, should be added an infinite number of analytical components which, in the end, only all united give the resultant of the total cash flow in the activity of (re) insurance companies. Only conditionally, this continuous integrated cash flow from the activities of (re)insurance companies can be divided into three parts: (a) calculation of the amount of pre-

mium (net, gross and their components) and ways of its effective collection, (b) direct financial management, managing investment portfolio of temporarily free funds and (c) managing the process of payment of the contracted insurance amount to the insurance beneficiary. The calculation of the amount of the premium and the ways of its effective collection belong to the direct field of actuarial science (explicitly actuarial mathematics), and from the point of view of cash flow it is the inflow of funds to the account of the (re) insurance company.

Managing the investment portfolio of temporarily free funds that came to the account of the (re)insurance company on the basis of the collected net premium means a particularly complex and expert way of direct financial management in insurance. Business in times of crisis requires additional complexity and expertise. Such business conditions require additional knowledge and skills. From the point of view of cash flow, in this segment, we very often have multiple inflows and outflows of individual and special funds that should have (always) a positive balance. How to achieve that this balance, first outflows, and then inflows, has a satisfactory and possible positive value when investing temporarily free funds? Such an outcome of this cash flow requires specialized knowledge that is subject to permanent upgrading.

The process of payment of the contracted insurance amount to the insurance beneficiary is the final goal of the obligation, but it does not have to be the final termination of the obligation relationship. Here too, should exist appropriate financial management. Here, too, actuarial science, business, self-sustainability of the (re)insurance company, marketing, and the continuation of building the reputation of both insurers and insurance activities should be present at work. It can be said: this is a special topic that requires a special elaboration.

These three, only conditionally fragmented, parts of financial management in insurance are integrated in the business process of the insurer and represent a whole connected by correlative relationships of a causal nature.

The basic business principles of a conventional corporate insurer, (re)insurance company, are: security, liquidity and profitability. These principles are the beginning, course and completion of all business operations in the insurance industry. These three determinants: security, liquidity and profitability are synthetically manifested in the solvency category which is a *conditio sine qua non* in the insurance industry. Therefore, the basis of effective risk (risks) management is to ensure the solvency of (re)insurers.

In the insurance industry, life and non-life insurance have their common and special characteristics. This also applies to the financial aspect and financial management in insurance. Therefore, solvency assessment models in non-life and life insurance are presented separately. Consistent application of current solvency provisions should also mean the realization of the basic business principles of insurers, especially security and liquidity. The degree of profitability, however, is in the domain of financial management. But all this must be viewed integrally and inextricably correlated.

The activity and insurance industry is essential for every individual, every natural and legal person, social groups (regardless of their size, essence and form), society as a whole, complete economic importance. „Tvornica“, „Fabrika“ industry is a (re)insurance company that should (must) produce security through its products. Due to their financial effects, (re)insurance companies are rightly called one of the most important institutional investors. As proof of this, we provide several statistical indicators (source: Bosna reosiguranje, March 2021):

U 2019. godini premija osiguranja u cijelom svijetu bila je u USD 6.292.600.000.000 (6 biliona 292 milijarde i 600 miliona USD). U 2018.

godini bila je 6 biliona 149 milijardi i 20 miliona USD. Po područjima i strukturi, premija osiguranja je u 2019. godini iznosila (tabela 1):

Područje	Život mio USD	Neživot mio USD	Ukupno mio USD
Sjeverna Amerika	681.839	1.911.441	2.593.280
Južna Amerika	74.199	82.947	157.146
Razvijeni EMEA	971.704	631.588	1.603.292
EMEA u razvoju	74.338	119.142	193.479
Azija – Pacifik raz.	645.157	289.196	934.353
Azija – Pacifik neraz.	469.030	342.020	811.050
Cijeli svijet	2.916.267	3.376.333	6.292.600

U sadašnjoj regiji, na geografskom području bivše SFR Jugoslavije, u 2019. godini, premija je iznosila (tabela 2):

Zemlja	Život mio EUR	Neživot mio EUR	Ukupno mio EUR
Slovenija	596,01	1.739,82	2.334,83
Hrvatska	412,01	997,14	1.409,15
Srbija	213,14	700,60	913,74
BiH	81,00	308,99	390,00
Sjev. Makedonija	29,77	142,35	172,12
Kosovo*	3,50	95,70	99,20
Crna Gora	17,10	77,60	94,70

Rezultati osiguranja u Bosni i Hercegovini u 2019. i 2020. godini u KM jesu (tabela 3):

BiH	2019.	2020.
Neživot	604.343.575	600.059.356
Život	158.436.956	156.385.665
Ukupno	762.780.531	56.445.021
Federacija BiH	2019.	2020.
Neživot	398.264.038	398.340.194
Život	133.757.207	30.751.261
Ukupno	532.021.245	529.091.455
Republika Srpska	2019.	2020.
Neživot	206.079.537	201.719.162
Život	24.679.749	25.634.404
Ukupno	230.759.286	227.353.566

Navedeni zvanični statistički podaci o visini premije dovoljno govore, sami za sebe, zašto su (re)osiguravajuća društva nazvana jednim od najznačajnijih institucionalnih investitora na finansijskom tržištu, ali i na tržištu realnih dobara. Veličina i struktura prezentovanih iznosa premija bitan je pokazatelj za finansijski menadžment u osiguranju. Veličina premija ukazuje na njihov sintetički kvantitativan obim, a njihova struktura (odnos bruto i neto premije; premije životnih i neživotnih osiguranja) na mogućnosti oblika i načina investiranja, plasiranja privremeno slobodnih novčanih sredstava. Realnosti kapaciteta i boniteta investitora, osiguravatelja, na jednoj strani, i realnost tržišta u njegovom okruženju, uključujući pravnu regulativu i poslovni ambijent u vidu ekonomske i poslovne politike, na drugoj strani, daju materijalnu osnovu za finansijski menadžment u osiguranju. Ovo je potreban uvjet za kompleksan posao finansijskog menadžmenta, ali nije i dovoljan! Dovoljan uvjet je znanje! Dio tog neophodnog znanja daje i ovaj članak fokusiran na istraživanje mjesta i uloge industrije osiguranja u ekonomskom razvoju Bosne i Hercegovine, posebno u uslovima krize.

Planetarna kriza započeta u prvom kvartalu 2020. godine virusom korona, dobivši sve karakteristike pandemije, kojoj se ni nakon go-

dine dana ne može prognozirati završetak, samo je najnaglašeniji pojava oblik življenja i poslovanja u uslovima krize. Nažalost, nije to jedini oblik realne krize koja ima velike negativne sinergijske reperkusije na život i rad svih ljudi na planeti Zemlji i njihovih društvenih i radnih organizacija (ma koje vrste one bile). Velika finansijska kriza, a može se slobodno nazvati i civilizacijska kriza, objelodanjena 2007, odnosno 2008. godine, nije još anulirana u većem dijelu svijeta. Učestale velike prirodne katastrofe (zemljotresi, cunami...), sa planetarnim poremećajima klimatskih promjena, predstavljaju izvore kriznih stanja sa nekonačnim horizontom njihovog dešavanja i nesagledivim negativnim posljedicama za čovjeka, ljude, njihovu životnu i radnu sredinu.

Djelatnost i industrija osiguranja, sa svim svojim institucijama, posebno osiguratelji, (re)osiguravajuća društva, imaju javno odgovornu ulogu u izvršavanju svoje misije i vizije i opravdavaju svoje kontinuirano postojanje kroz cijelu dosadašnju historiju ljudskog roda, ali i budućnost čovječanstva na planeti Zemlji. Zbog toga autori ovog članka, i na ovaj način, žele dati svoj doprinos ovoj važnoj tematici.



In 2019, worldwide insurance premiums were \$ 6,292,600,000,000 (\$ 6 trillion 292 billion and \$ 600 million). In 2018, it was 6 trillion 149 billion and 20 million USD. By areas and structure, the insurance premium in 2019 was (Table 1):

Area	Life USD	Non-life USD	Total USD
North America	681.839	1.911.441	2.593.280
South America	74.199	82.947	157.146
Developed EMEA	971.704	631.588	1.603.292
EMEA in development	74.338	119.142	193.479
Asia-Pacific developed	645.157	289.196	934.353
Asia-Pacific under-developed	469.030	342.020	811.050
Worldwide	2.916.267	3.376.333	6.292.600

In the current region, in the geographical area of the former SFR Yugoslavia, in 2019, the premium was (Table 2):

Country	Life EUR	Non-life EUR	Total EUR
Slovenia	596,01	1.739,82	2.334,83
Croatia	412,01	997,14	1.409,15
Serbia	213,14	700,60	913,74
BiH	81,00	308,99	390,00
North Macedonia	29,77	142,35	172,12
Kosovo*	3,50	95,70	99,20
Montenegro	17,10	77,60	94,70

The results of insurance in Bosnia and Herzegovina in 2019 and 2020 in BAM are (Table 3):

BiH	2019.	2020.
Non-life	604.343.575	600.059.356
Life	158.436.956	156.385.665
Total	762.780.531	756.445.021
Federation of BiH	2019.	2020.
Non-life	398.264.038	398.340.194
Life	133.757.207	130.751.261
Total	532.021.245	529.091.455
Republic of Srpska	2019.	2020.
Non-life	206.079.537	201.719.162
Life	24.679.749	25.634.404
Total	230.759.286	227.353.566

These official statistics on the amount of premiums speak for themselves, why (re) insurance companies are called one of the most important institutional investors in the financial market, but also in the real goods market. The size and structure of the presented amounts of premiums is an important indicator for financial management in insurance. The size of premiums indicates its synthetic quantitative volume, and their structure (the ratio of gross and net premiums; life and non-life insurance premiums) to the possibilities of the form and manner of investment, placement of temporarily free funds. The realities of capacity and solvency of investors, insurers, on the one hand and the reality of the market in its environment, including legal regulations and business environment in the form of economic and business policy, on the other hand, provide a material basis for financial management in insurance. This is a necessary condition for the complex work of financial management, but it is not enough! A sufficient condition is knowledge! Part of this necessary knowledge is provided by this paper focused on researching the position and role of the insurance industry in the economic development of Bosnia and Herzegovina, especially in times of crisis.

The planetary crisis that began in the first quarter of 2020 with the Corona-19 virus, having acquired all the characteristics of a pandemic that cannot be predicted to end even after a year, is only the most pronounced form of living and doing business in a crisis. Unfortunately, this is not the only form of real crisis that has great negative synergetic repercussions on the life and work of all people on planet Earth and their social and work organizations (whatever their type). The great financial crisis, and it can be comfortably called the crisis of civilization, revealed in 2007 and 2008, has not yet been annulled in most parts of the world. Frequent major natural disasters (earthquakes, tsunamis, ...), with planetary disturbances of climate change, are sources of crises with an infinite horizon of their occurrence and unforeseeable negative consequences for humans, their environment and work environment.

The insurance industry, with all its institutions, especially insurers, (re) insurance companies have a publicly responsible role in fulfilling their mission and vision and justify their continued existence throughout the history of mankind, but also the future of humanity on planet Earth. Therefore, the authors of this article, and in this way, want to contribute to this important topic.

## 1. PREGLED LITERATURE

### 1.1. Funkcije osiguranja

S obzirom na stepen važnosti u privredi zemlje, osiguranje ima nekoliko značajnih funkcija. Kvaliteta djelatnosti osiguranja kao segmenta finansijskog tržišta ekonomije može se mjeriti u ovisnosti od toga koliko osiguranje ispunjava svoje osnovne funkcije: funkciju zaštite, funkciju mobilizacije i akumulacije finansijskih sredstava i društvenu – socijalnu funkciju.

Funkcija zaštite je sastavni dio ljudskog bića, a potreba za osjećajem sigurnosti (što je odsustvo osjećaja ugroženosti) smatra se osnovnom ljudskom potrebom. Prema Maslowljevoj hijerarhiji potreba, potreba za sigurnošću obuhvata potrebe za sigurnošću u domenu tjelesne sigurnosti, moralne, zdravstvene, imovinske... i nalazi se odmah iznad osnovnih fizioloških potreba, koje su baza spomenute hijerarhije. Kao što je istaknuto, od davnina se čovjek na različite načine pokušavao štiti od opasnosti, a evolucijom ljudskog društva došlo se do sofisticiranih oblika zaštite ljudi i njihove imovine u vidu osiguranja. Funkcija zaštite može biti neposredna i posredna.

Sve aktivnosti neposredne zaštite mogu se podijeliti na preventivne i represivne mjere. Preventivne mjere (lat. *praevenire* – spriječiti) jesu sve one mjere koje su praćene određenim aktivnostima i instrumentima koji ispituju moguće uzroke koji mogu dovesti do nastupanja rizičnog događaja, odnosno rade na sprečavanju ili uklanjanju tih uzroka. Osiguravajuća društva pokušavaju stimulirati same osiguranike da provode određene preventivne mjere, te tako smanje izloženost osiguranog predmeta, ali i novčane izdatke osiguravatelja. S tim ciljem, osiguravatelji razvijaju različite mjere stimulacija ili sankcija. Stimulacije se provode kroz diferenciranje premija, davanje bonusa – popusta pri osiguranju (osiguranici koji imaju pozitivan odnos premija i šteta mogu dobiti osiguranje po nižim premijskim stopama ili uz odobravanje bonusa na ugovor), ali i ugovaranjem franšize (način da osiguravatelj umanju svoju obavezu po osnovu isplate štete ukoliko dođe do realizacije osiguranog rizika; način sudjelovanja osiguranika u dijelu štete) (Čurak i Jakovčević, 2007). Suprotna mjera su sankcije kojima osiguravajuće društvo sankcionira nesavjesno ponašanje i nebrigu osiguranika prema osiguranom predmetu. Mjere suprotne preventivnim jesu represivne mjere koje predstavljaju način umanjivanja posljedica već nastale štete. Poduzimanjem represivnih mjera osiguravajuće društvo pokušava primjereno spasiti imovinu i ljude kada već dođe do ostvarenja osiguranog slučaja (realizacija osiguranog rizika). Mjere neposredne zaštite (preventivne i represivne) obaveza su obje strane ugovora o osiguranju, i osiguranika i osiguravatelja.

Druga vrsta zaštitne funkcije jeste posredna zaštita u osiguranju, koja se ogleda u ispunjavanju ugovornih obaveza stranaka u ugovoru o

osiguranju. Osiguranik je obavezan izvršiti uplate premije na način i u iznosu koji je definiran ugovorom o osiguranju (ili u polici osiguranja), a osiguravatelj je u obavezi u slučaju nastanka osiguranog rizika osiguraniku ili korisniku osiguranja isplatiti osiguranu sumu u iznosu i na način propisan ugovorom o osiguranju. Osnovna karakteristika ovakvog vida zaštite za osiguranika jeste sigurnost življenja (ekonomska i psihološka), a za osiguravatelja kontinuitet poslovanja (ujednačen sistem priliva i odliva).

Druga funkcija osiguranja u nacionalnoj ekonomiji jeste funkcija mobilizacije i akumulacije finansijskih sredstava. Prikupljanjem premija od osiguranika, osiguravatelj obavlja svoju osnovnu djelatnost, a samim tim raspolaže privremenim viškovima novca te ih može ulagati na tržište. Na taj način osiguravatelj širi broj i vrste osiguranja imovine i lica, utječe na stav pojedinca prema osiguranom predmetu i predstavlja značajnog institucionalnog investitora. Prikupljeni novac osiguravatelj u skladu sa zakonskim odredbama ulaže na finansijsko tržište te tako kreira svoj investicijski portfolio. Kvaliteta, struktura i ročnost spomenutog portfolija direktno utječe na poslovanje društva za osiguranje. Naime, sredstva u pravilu treba da budu uložena tako da mogu uvijek obezbijediti isplatu osiguranih suma ili naknada štete u predviđenim rokovima i ugovorenim iznosima.

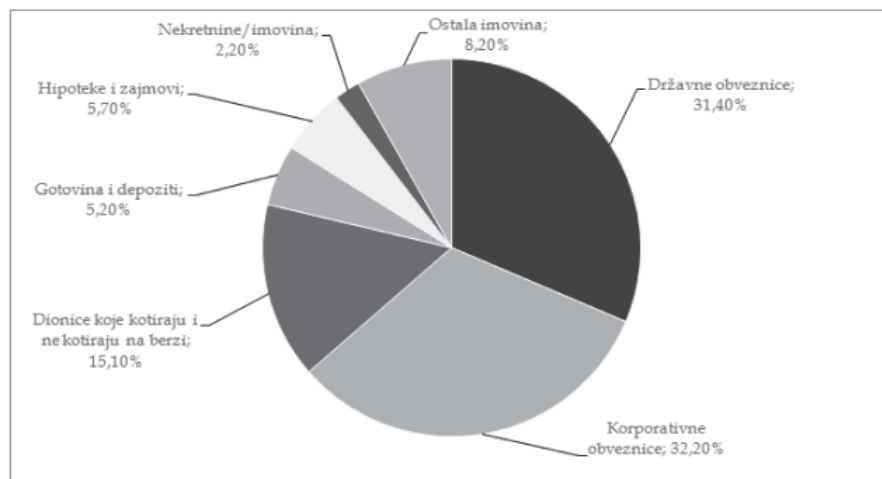
U tom smislu, osiguravatelj treba paziti na strukturu ulaganja kroz prizmu sigurnosti i likvidnosti uloženi sredstava. Društveno-socijalnu funkciju osiguranje ostvaruje kroz ekonomsku, zdravstvenu i socijalnu zaštitu čovjeka.

## 2. REZULTATI ISTRAŽIVANJA

### 2.1. Komparativni pokazatelji razvijenosti finansijskih tržišta i finansijske pozicije industrije osiguranja

U razvijenim tržišnim ekonomijama višestruko su veće i raznovrsnije mogućnosti za investicije zahvaljujući razvijenim finansijskim tržištima na kojima je u ponudi veliki broj različitih vrsta finansijskih instrumenata. Sektor osiguranja je najveći institucionalni investitor u Europi (sa preko 10 triliona eura vrijednosti imovine), koji je visoko koncentriran u malom broju zemalja (Ujedinjeno Kraljevstvo, Francuska, Njemačka, Italija). Podaci EIOPA (Q2 2019) pokazuju da se tradicionalni portfoliji industrije osiguranja u Europi sastoje od državnih obveznica (31,4%), korporativnih obveznica (32,2%), vlasničkog kapitala koji kotira i/ili ne kotira na berzi (15,1%), gotovine i depoziti (5,2%), hipoteka i zajmova (5,7%), i ostale imovine (8,2%):

**Grafikon 1.** Portfolio ulaganja sektora osiguranja u Europi u Q2 2019. godine



Izvor: EIOPA (Q2 2019), [https://www.ecmi.eu/sites/default/files/tfaa\\_final\\_report\\_ecmi.pdf](https://www.ecmi.eu/sites/default/files/tfaa_final_report_ecmi.pdf)

## 1. LITERATURE REVIEW

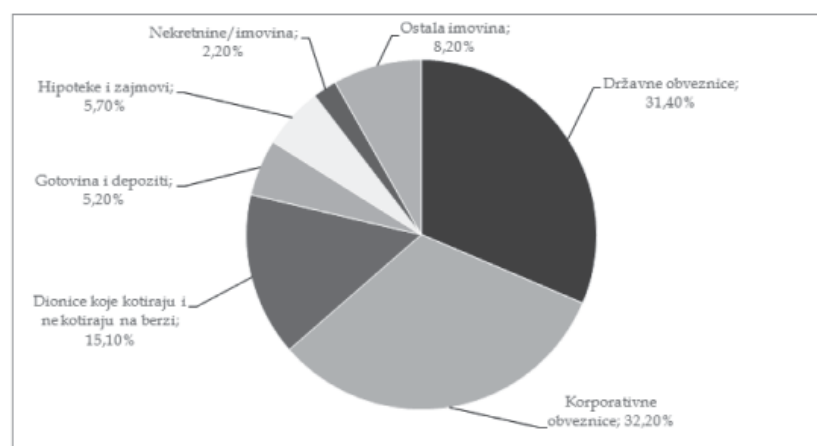
### 1.1. Insurance functions

Given the degree of importance in the country's economy, insurance has several important functions. The quality of insurance activity as a segment of the financial market of the economy can be measured depending on how much insurance fulfills its basic functions: the function of protection, the function of mobilization and accumulation of financial resources and the socio-social function.

The function of protection is an integral part of the human being, and the need for a sense of security (which is the absence of a sense of vulnerability) is considered a basic human need. According to Maslow's hierarchy of needs, the need for security encompasses the need for security in the domain of physical security, moral, health, property, ... and is just above the basic physiological needs that are the basis of the mentioned hierarchy. As pointed out, since ancient times man has tried in various ways to protect himself from danger, and the evolution of human society has led to sophisticated forms of protection of people and their property in the form of insurance. The protection function can be direct or indirect.

All immediate protection activities can be divided into preventive and repressive measures. Preventive measures (lat. *praevenire* – prevent) are all those measures that are accompanied by certain activities and instruments that examine the possible causes that can lead to the occurrence of a risky event, or work to prevent or eliminate these causes. Insurance companies try to stimulate the insured themselves to implement certain preventive measures, and thus reduce the exposure of the insured object, but also the monetary expenses of the insurer. Because of this, insurers develop various incentive or sanction measures. Incentives are implemented through the differentiation of premiums, giving bonuses - discounts on insurance (insured persons who have a positive premium-claims ratio can get insurance at lower premium rates or with the approval of bonuses on the contract), but also by contracting a franchise (way for the insurer to reduce its obligation based on the payment of damage if the insured risk is realized; way for the insured to participate in the part of the damage) (Curak i Jakovcevic, 2007). The opposite measure is sanctions by which the insurance company sanctions the negligent behavior and negligence of the insured towards the insured object. Measures contrary to preventive measures are repressive measures that represent a way to reduce the consequences of the damage already caused. By taking repressive measures, the insurance company tries to adequately save property and people when the insured event has already materialized (realization of the insured risk). Immediate protection measures (preventive and repressive) are the obligation of both parties to the insurance contract, both the insured and the insurer.

**Chart 1.** Investment portfolio of the insurance sector in Europe in Q2 2019



Source: EIOPA-e (Q2 2019) [https://www.ecmi.eu/sites/default/files/tfaa\\_final\\_report\\_ecmi.pdf](https://www.ecmi.eu/sites/default/files/tfaa_final_report_ecmi.pdf).

The second type of protective function is indirect protection in insurance, which is reflected in the fulfillment of contractual obligations of the parties specified in the insurance contract. The insured is obliged to make premium payments in the manner and in the amount defined by the insurance contract (or in the insurance policy), and the insurer is obliged to pay the insured amount to the insured or the insurance beneficiary as stated in the insurance contract. The main characteristic of this type of protection for the insured is security of life (economic and psychological), and for the insurer, business continuity (uniform system of inflows and outflows).

Another function of insurance in the national economy is the function of mobilization and accumulation of financial resources. By collecting premiums from the insured, the insurer performs its core business and thus disposes of temporary surplus money and can invest it in the market. In this way, the insurer expands the number and types of property and personal insurance, influences the attitude of the individual towards the insured object and represents a significant institutional investor. In accordance with the legal provisions, the insurer invests the collected money in the financial market and thus creates its investment portfolio. The quality, structure and maturity of the said portfolio directly affect the business of the insurance company. Namely, funds should, as a rule, be invested in such a way that they can always ensure the payment of insured amounts or damages within the stipulated deadlines and agreed amounts.

In this sense, the insurer should pay attention to the structure of investments through the prism of security and liquidity of invested funds. Insurance performs its social function through economic, health and social protection of a person.

## 2. RESEARCH RESULTS

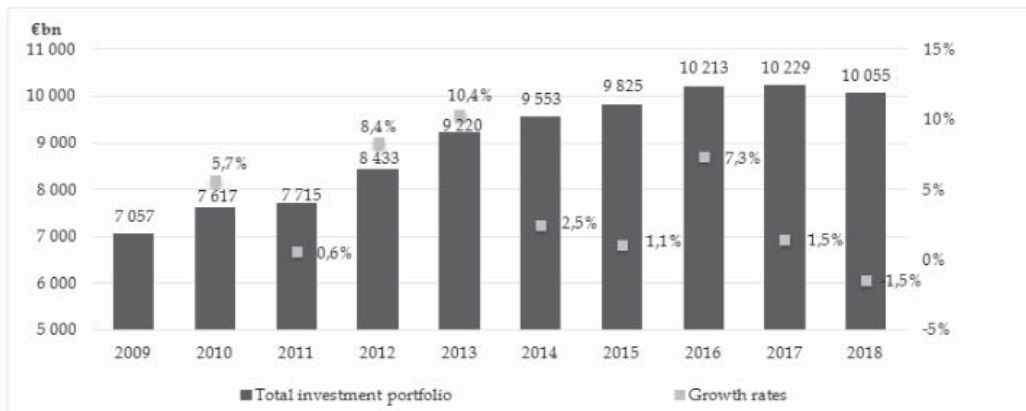
### 2.1. Comparative indicators of the development of financial markets and the financial position of the insurance industry

In developed market economies, investment opportunities are many times larger and more diverse thanks to developed financial markets, which offer a large number of different types of financial instruments. The insurance sector is the largest institutional investor in Europe (with over € 10 trillion in asset value), highly concentrated in a small number of countries (UK, France, Germany, Italy). EIOPA data (Q2 2019) show that the traditional portfolios of the insurance industry in Europe consist of government bonds (31.4%), corporate bonds (32.2%), listed and / or unlisted equity (15.1%), cash and deposits (5.2%), mortgages and loans (5.7%), assets (2.2%) and other assets (8.2%):

U razvijenim ekonomijama, (re)osiguravajuća društva posvećuju znatno veću pažnju i poslovnu odgovornost u održavanju likvidnosti i rentabilnosti investiranja sredstava tehničkih rezervi, matematičke rezerve i garantnog fonda u skladu sa novim režimom Solventnost II u Europskoj uniji (EU).

U sljedećem grafikonu prikazan je rast investicionog portfolija osiguranja u 32 europske države u periodu 2010–2018. u bilionima eura sa 7.697,39 (2010) na 10.186,31 (2018) ili za 32,34%:

**Grafikon 2.** Ukupni investicioni portfolio sektora osiguranja u 32 države Europe 2009–2018. (€bn)



Izvor: *European Insurance in Figures – 2018 data, Insurance Europe, 2020, str. 42.*

U tabeli 4. prikazan je rast investicionog portfolija po osnovnim vrstama osiguranja u istom periodu:

**Tabela 4.** Investicioni portfolio životnog i neživotnog osiguranja u 32 države Europe

Investicioni portfolio neživotnih osiguranja							
	2009.	2010.	2011.	2015.	2016.	2017.	2018.
Uzorak	1 198	1 251	1 283	1 593	1 661	1 658	1 617
% Promjene		2,1%	2,2%	2,5%	5,9%	1,0%	-2,4%
Investicioni portfolio životnog osiguranja							
	2009.	2010.	2011.	2015.	2016.	2017.	2018.
Uzorak	5 320	5 796	5 842	7 465	7 685	7 785	7 647
% Promjene		6,5%	-0,1%	0,4%	7,0%	2,8%	-1,5%

Izvor: *European Insurance in Figures – 2018 data, Insurance Europe, 2020, str. 42.*

Sektor osiguranja BiH ostvario je rast aktive u kontinuitetu od 2015. do 2018. godine i drugi je po učešću (iza banaka) u ukupnoj aktivni finansijskog sektora u BiH.

**Tabela 5.** Struktura učešća finansijskih institucija na finansijskom tržištu u BiH

miliona KM	2015.		2017.		2018.		2019.		Indeks rasta	
	Aktiva	Udio (%)	Aktiva	Udio (%)	Aktiva	Udio (%)	Aktiva	Udio (%)	18/17	19/18
Finansijske institucije										
Banke	23.829	87,47	27.249	88,26	29.854	88,46	32.508	88,70	109,6	108,9
Investicioni fondovi	834	3,06	855	2,77	889	2,63	855	2,33	104,0	96,2
Društva za osiguranje i reosiguranje	1.466	5,38	1.717	5,56	1.819	5,39	1.967	5,37	105,9	108,1
Mikrokreditne organizacije	640	2,35	791	2,56	891	2,64	996	2,72	112,6	111,8
Lizing društva	475	1,74	260	0,84	297	0,88	324	0,88	114,2	109,1
Ukupno za sektor	27.244	100	30.872	100	33.750	100	36.650	100	109,3	108,6

Izvor podataka: *Statistika tržišta osiguranja u BiH za 2019, str. 17. (juli 2020. godine)*

No, ukupni potencijali domaćih finansijskih institucija su vrlo ograničeni i skromni u odnosu na regiju i Europu. Također, investicije osiguravajućih društava u BiH su mnogo puta manje po vri-

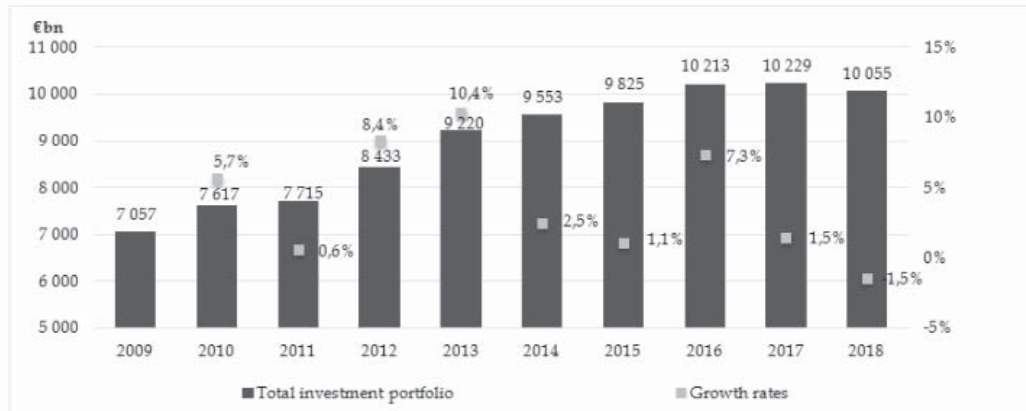
jednosti i bitno se razlikuju po strukturi od investicija u razvijenim ekonomijama Europe.



In developed economies, (re)insurance companies pay much more attention and business responsibility in maintaining liquidity and return on investment of technical reserves, mathematical reserves and the guarantee fund in accordance with the new Solvency II regime in the European Union (EU).

The following chart shows the growth of the insurance investment portfolio in 32 European countries in the period 2010-2018 in billions of euros from 7,697.39 (2010) to 10,186.31 (2018) or by 32.34%:

**Chart 2.** Total investment portfolio of the insurance sector in 32 European countries 2009–2018 (€bn)



Source: European Insurance in Figures - 2018 data, Insurance Europe, 2020, p. 42

Table 4 shows the growth of the investment portfolio by basic types of insurance in the same period:

**Table 4.** Investment portfolio of life and non-life insurance in 32 European countries

Non-life insurance investment portfolio							
	2009.	2010.	2011.	2015.	2016.	2017.	2018.
Sample	1 198	1 251	1 283	1 593	1 661	1 658	1 617
% Change		2,1%	2,2%	2,5%	5,9%	1,0%	-2,4%
Investicioni portfolio životnog osiguranja							
	2009.	2010.	2011.	2015.	2016.	2017.	2018.
Samle	5 320	5 796	5 842	7 465	7 685	7 785	7 647
% Change		6,5%	-0,1%	0,4%	7,0%	2,8%	-1,5%

Source: European Insurance in Figures - 2018 data, Insurance Europe, 2020, p. 42

The BiH insurance sector achieved continuous growth of assets from 2015-2018 and is the second in terms of participation (behind banks) in the total assets of the financial sector in BiH.

**Table 5.** Structure of the share of financial institutions in the financial market in BiH

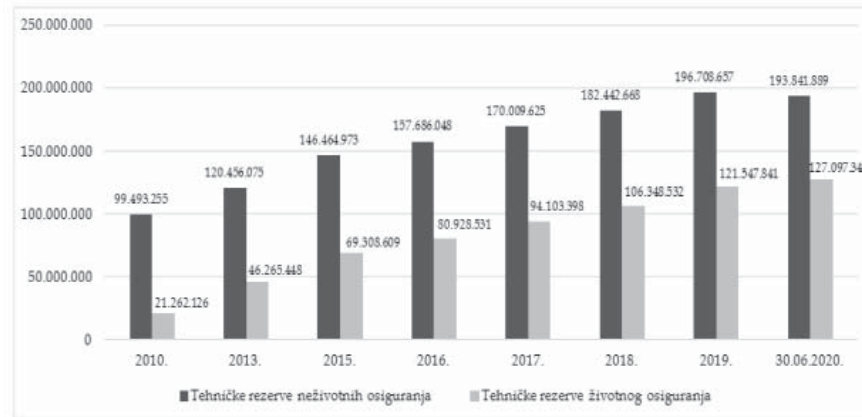
million BAM	2015.		2017.		2018.		2019.		Index rasta	
	Assets	Share (%)	Assets	Share (%)	Assets	Share (%)	Assets	Share (%)	18/17	19/18
Banks	23.829	87,47	27.249	88,26	29.854	88,46	32.508	88,70	109,6	108,9
Investment funds	834	3,06	855	2,77	889	2,63	855	2,33	104,0	96,2
Insurance and reinsurance companies	1.466	5,38	1.717	5,56	1.819	5,39	1.967	5,37	105,9	108,1
Microcredit organizations	640	2,35	791	2,56	891	2,64	996	2,72	112,6	111,8
Leasing companies	475	1,74	260	0,84	297	0,88	324	0,88	114,2	109,1
Total for the sector	27.244	100	30.872	100	33.750	100	36.650	100	109,3	108,6

Source: Statistics of the insurance market in BiH for 2019, p. 17 (July 2020)

However, the overall potential of domestic financial institutions is very limited and modest compared to the region and Europe. Also, investments of insurance companies in BiH are many times smaller

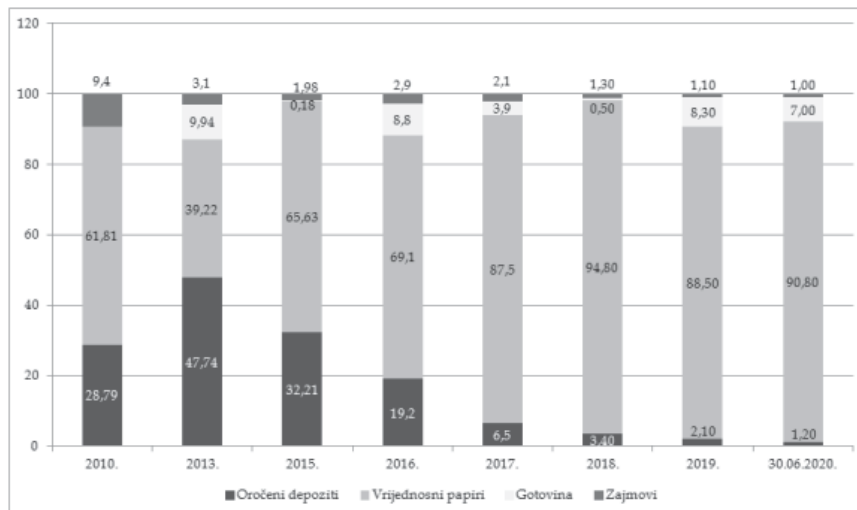
in value and differ significantly in structure from investments in developed economies of Europe.

**Grafikon 3. Vrijednost tehničkih rezervi po vrstama osiguranja u Republici Srpskoj (RS)**



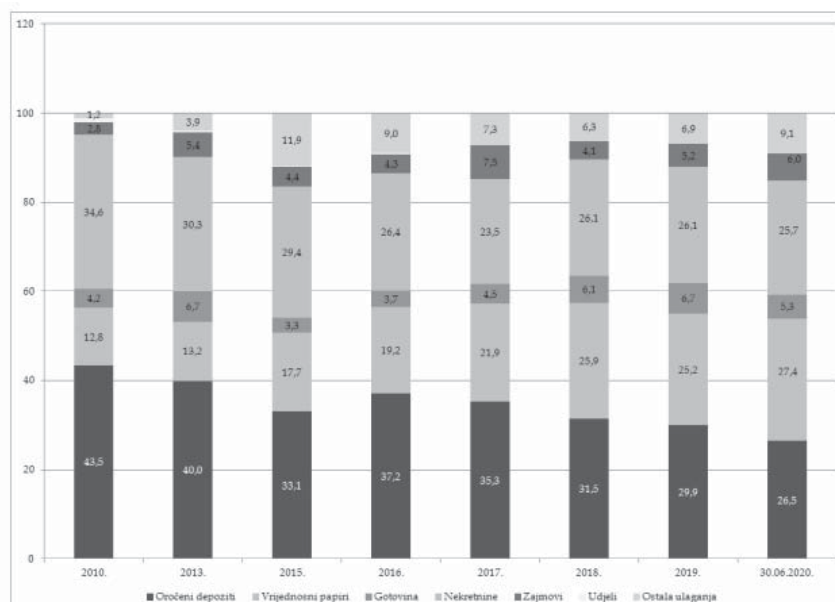
Izvor podataka: Agencija za osiguranje Republike Srpske, Izvještaj o stanju sektora osiguranja u Republici Srpskoj za period od 1. 1. 2020. do 30. 6. 2020. godine, septembar 2021. godine

**Grafikon 4. Struktura ulaganja tehničkih rezervi životnog osiguranja u RS (u %)**



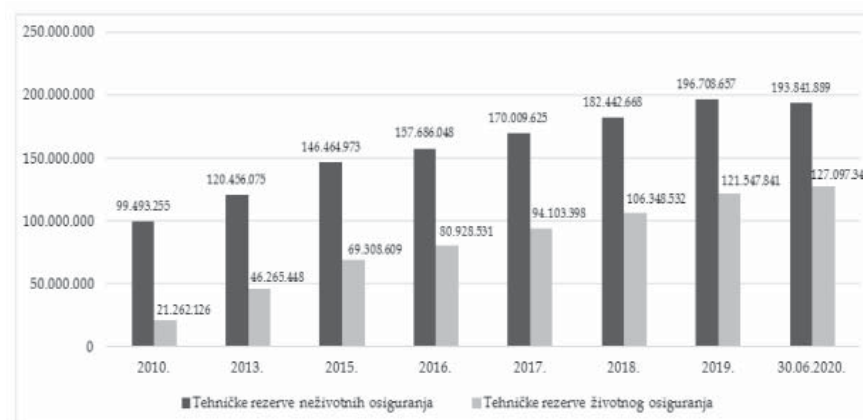
Izvor podataka: Agencija za osiguranje Republike Srpske, Izvještaj o stanju sektora osiguranja u Republici Srpskoj za period od 1. 1. 2020. do 30. 6. 2020. godine, septembar 2021. godine

**Grafikon 5. Struktura ulaganja tehničkih rezervi neživotnih osiguranja u RS (u %)**



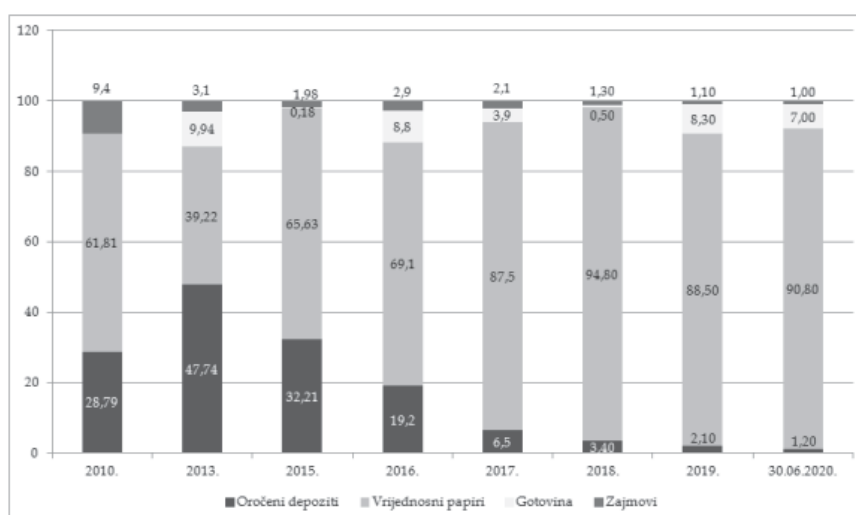
Izvor podataka: Agencija za osiguranje Republike Srpske, Izvještaj o stanju sektora osiguranja u Republici Srpskoj za period od 1. 1. 2020. do 30. 6. 2020. godine, septembar 2021. godine

**Chart 3.** Value of technical reserves by types of insurance in the Republic of Srpska (RS)



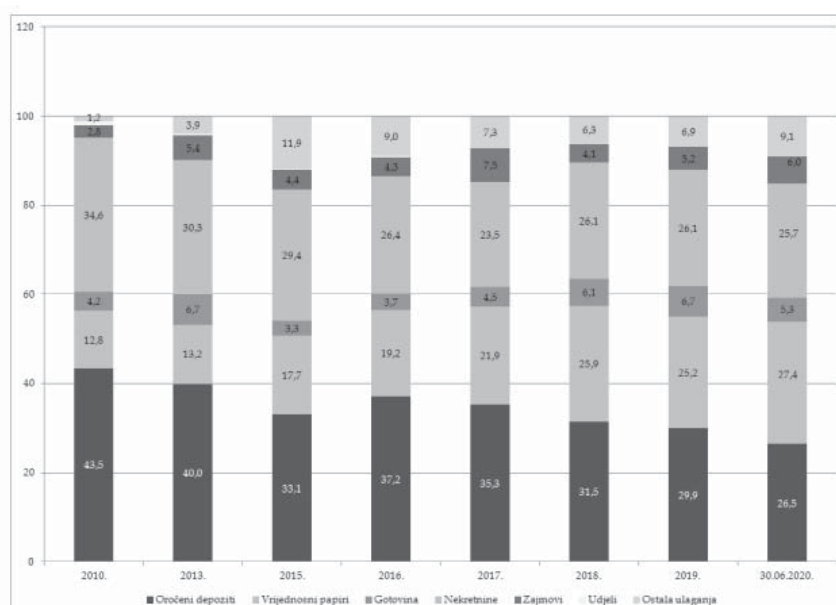
Source: Insurance Agency of Republic of Srpska, Report on the insurance situation sector of the Republic of Srpska for the period from 1 January 2020 to 30 June 2020, September 2021

**Chart 4.** Investment structure of technical life insurance reserves in RS (%)



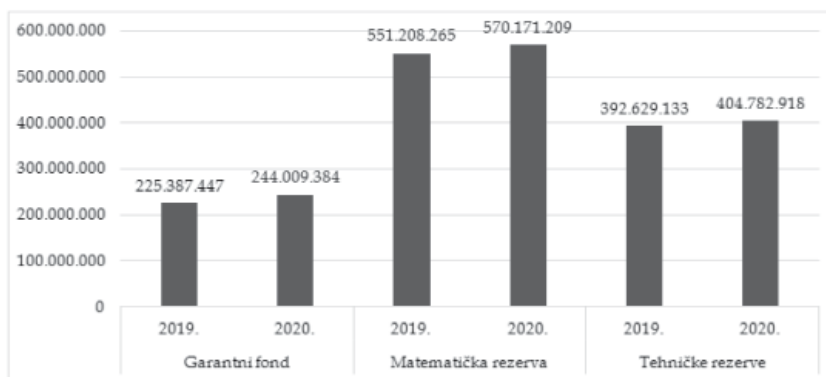
Source: Insurance Agency of Republic of Srpska, Report on the insurance situation sector of the Republic of Srpska for the period from 1 January 2020 to 30 June 2020, September 2021

**Chart 5.** Investment structure of technical non-life insurance reserves in RS (%)



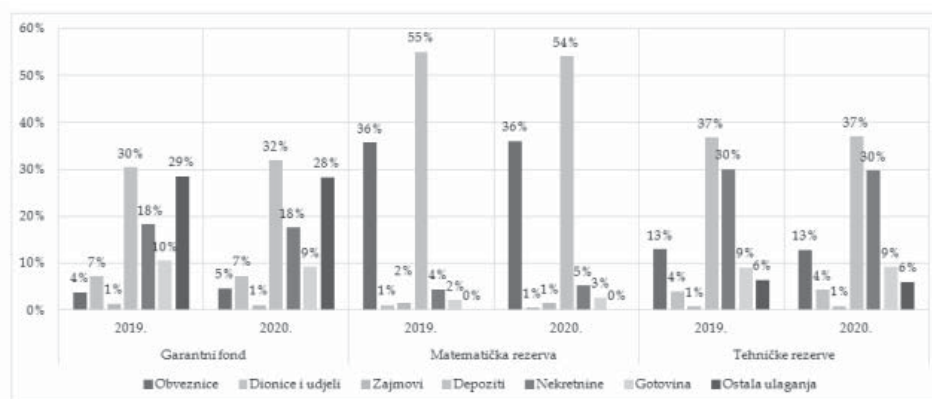
Source: Insurance Agency of Republic of Srpska, Report on the insurance situation sector of the Republic of Srpska for the period from 1 January 2020 to 30 June 2020, September 2021

**Grafikon 6. Raspoloživa sredstva osiguravatelja u FBiH (u KM)**



Izvor: Izvještaj o sektoru osiguranja Federacije BiH, Agencija za nadzor osiguranja FBiH

**Grafikon 7. Struktura ulaganja sredstava garantnog fonda, matematičke rezerve i tehničkih rezervi u FBiH**



Izvor: Izvještaj o sektoru osiguranja Federacije BiH, Agencija za nadzor osiguranja FBiH

U odnosu na razvijene europske zemlje, ekonomija BiH i, u okviru ostvarenoj premiji, učešću ukupne premije u bruto društvenom nje, sektor osiguranja nedovoljno su razvijeni i znatno zaostaju iza proizvodu, BDP-u po stanovniku i visini premije po stanovniku. prosjeka zemalja članica EU prema: bruto društvenom proizvodu,

**Tabela 6. Kretanje BDP-a i premije u EU 27 i u BiH u periodu 2007–2019.**

	2007.	2008.	2010.	2015.	2018.	2019.
GDP u EU 27 (u milionima eura)	12.398.526	12.494.352	12.280.644	14.710.626	18.118.140	15.376.490
Indeks prethodna godina = 100		100,77	98,29	119,79	123,16	84,87
GDP u BiH (u milionima eura)	11.098	12.675	12.692	14.435	17.132	18.066
Indeks prethodna godina = 100		114,21	100,13	113,73	118,68	105,45
GDP BiH / GDP EU 27	0,09%	0,10%	0,10%	0,10%	0,09%	0,12%
Premija u EU 27 (milioni eura)	1.026.645	1.066.731	1.116.225	1.218.895	1.315.377	1.047.139
Indeks prethodna godina = 100		103,90	104,64	109,20	107,92	79,61
Premija u BiH (milioni eura)	206	231	242	306	366	390
Indeks prethodna godina = 100		112,14	104,76	126,45	119,61	106,56
Premija BiH / premija EU 27	0,02%	0,02%	0,02%	0,03%	0,03%	0,04%

Izvori: Izvedeno iz podataka Eurostat newsrelease euroindicators <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do> i podataka Agencije za osiguranje u BiH, Statistika tržišta osiguranja u BiH za 2007–2019.

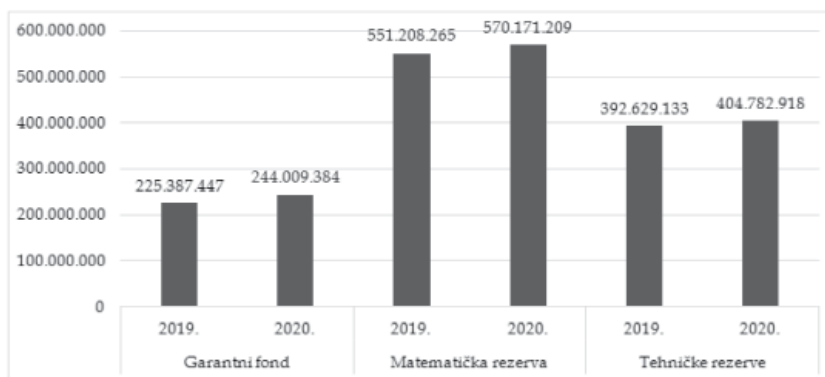
Pokazatelji penetracije osiguranja i gustoće osiguranja, tj. prosječne godišnje bruto premije po stanovniku, također ukazuju na nedovoljnu razvijenost tržišta osiguranja u BiH u odnosu na prosjek Europske unije.

**Tabela 7. Premija po stanovniku i učešće u BDP-u u EU 27 i u BiH**

	2007.	2008.	2010.	2015.	2017.	2018.	2019.
Premija po stanovniku EU 27, eur	2.204	2.540	2.241	2.390	2.348	2.335	2.122
Premija po stanovniku u BiH, eur	54	60	64	80	100	135	112
Udio premije u BDP-u za EU 27	8,80%	8,60%	8,43%	8,29%	7,20%	7,26%	6,81%
Udio premije u BDP-u za BiH	1,90%	1,80%	1,91%	2,12%	2,18%	2,11%	2,19%

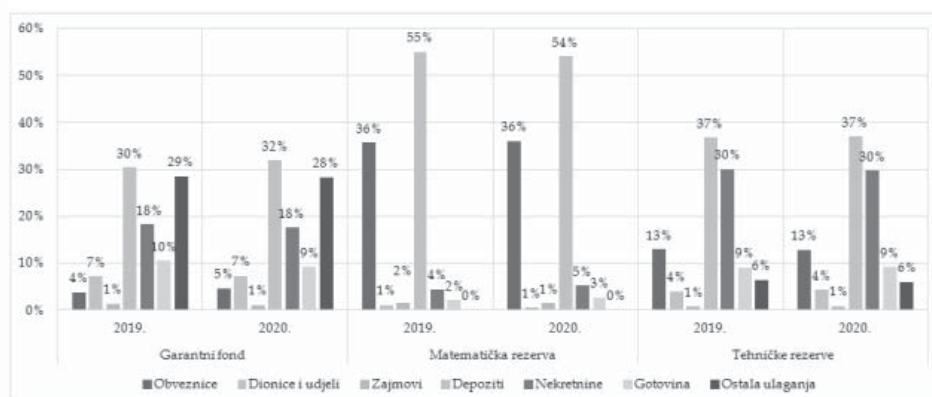
Izvedeno: Agencija za osiguranje u BiH, Statistika tržišta osiguranja u BiH – izvještaji za 2007, 2008, 2009, 2010, 2015, 2019.

**Chart 6. Insurers' funds available in FBiH (BAM)**



Source: Report on the insurance sector of the Federation of BiH, The Insurance Supervisory Agency of the Federation of BiH

**Chart 7. Investment structure of guarantee fund, mathematical reserves and technical reserves in the FBiH**



Source: Report on the insurance sector of the Federation of BiH, The Insurance Supervisory Agency of the Federation of BiH

Compared to developed European countries, the BiH economy and within it the insurance sector are underdeveloped and lag far behind the average of EU member states in terms of: gross domestic

product, realized premium, share of total premium in gross domestic product, GDP per capita and premium per capita.

**Table 6. Movement of GDP and premiums in the EU27 and in BiH in the period 2007-2019**

	2007.	2008.	2010.	2015.	2018.	2019.
GDP in EU 27 (in millions of euros)	12.398.526	12.494.352	12.280.644	14.710.626	18.118.140	15.376.490
Index previous year = 100		100,77	98,29	119,79	123,16	84,87
GDP u BiH (in millions of euros)	11.098	12.675	12.692	14.435	17.132	18.066
Index previous year = 100		114,21	100,13	113,73	118,68	105,45
GDP BiH / GDP EU 27	0,09%	0,10%	0,10%	0,10%	0,09%	0,12%
Premija u EU 27 (millions of euros)	1.026.645	1.066.731	1.116.225	1.218.895	1.315.377	1.047.139
Index previous year = 100		103,90	104,64	109,20	107,92	79,61
Premija u BiH (millions of euros)	206	231	242	306	366	390
Index previous year = 100		112,14	104,76	126,45	119,61	106,56
Premium BiH / Premium EU 27	0,02%	0,02%	0,02%	0,03%	0,03%	0,04%

Sources: Derived from Eurostat newsrelease euroindicators data <http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do> and Insurance Agency of Bosnia and Herzegovina Statistics of insurance market in BiH 2007- 2019

Indicators of insurance penetration and insurance density, ie average annual gross premium per capita, also indicate insufficient

development of the insurance market in BiH compared to the European Union average.

**Table 7. Per capita premium and share in GDP in the EU27 and in BiH**

	2007.	2008.	2010.	2015.	2017.	2018.	2019.
Premium per capita in EU27 eur	2.204	2.540	2.241	2.390	2.348	2.335	2.122
Premium per capita in BiH eur	54	60	64	80	100	135	112
Share of premium in GDP for EU27	8,80%	8,60%	8,43%	8,29%	7,20%	7,26%	6,81%
Share of premium in GDP for BiH	1,90%	1,80%	1,91%	2,12%	2,18%	2,11%	2,19%

Derived: Insurance Agency of Bosnia and Herzegovina Statistics of insurance market in BiH –reports for 2007., 2008., 2009., 2010., 2015., 2019.



Prema vrijednosti imovine, kapitala i ostvarene premije osiguranja, sektor osiguranja u BiH zaostaje iza sektora osiguranja u zemljama regiona, a pogotovu iza razvijene industrije osiguranja zemalja

članica EU. Također, oba važna finansijska sektora u BiH (bankarski i osiguravajući) znatno zaostaju prema finansijskom potencijalu iza razvijenih zemalja EU, a i iza većine zemalja u regionu.

**Tabela 8.** Premija po stanovniku u EU 27, u BiH i u susjednim zemljama

	2007.	2008.	2010.	2015.	2017.	2018.	2019.
Premija po stanovniku EU 27, EUR	2.204	2.540	2.241	2.390	1.465	2.335	2.122
Premija po stanovniku Hrvatska, EUR	278	302	292	270	294	326	341
Premija po stanovniku Srbija, EUR	75	80	80	93	112	121	131
Premija po stanovniku Crna Gora, EUR	82	96	99	124	131	140	152
Premija po stanovniku u BiH, EUR	54	60	64	80	100	135	112

Izvedeno iz podataka Agencije za osiguranje u BiH, Statistika tržišta osiguranja u BiH – izvještaji za 2007–2019, [https://europa.eu/european-union/about-eu/countries/member-countries\\_hr](https://europa.eu/european-union/about-eu/countries/member-countries_hr)

Slaba konkurentnost sektora osiguranja proizlazi iz ukupnog nezadovoljavajućeg makroekonomskog položaja BiH.

**Tabela 9.** Pozicija ekonomije BiH po nekim pokazateljima globalne konkurentnosti

	2007/08.	2008/09.	2009/10.	2010/11.	2013/12.	2016/15.	2019/2018.
	od 131	od 134	od 133	od 139	od 144	od 140	od 141
Indeks globalne konkurentnosti	106	107	109	102	88	111	92
Institucije	113	123	128	126	85	127	114
Makroekonomska stabilnost	90	57	69	81	97	98	64
Veličina tržišta	80	92	90	93	93	97	101
Efikasnost tržišta roba	113	123	125	127	109	129	108
Tehnološka spremnost	110	109	95	85	68	79	80
Inovativnost i sofisticiranost	123	129	127	120	99	120	117

Izvor: Izvještaj o kompetitivnosti BiH 2019–2018, Ekonomski fakultet Sarajevo, Sarajevo, 2020.

### 3. DISKUSIJA

#### 3.1. Pandemija COVID-19 – novi sistemski rizik i prijetnja

Pandemija COVID-19 je tokom 2020. godine i danas uzročnik globalne prijetnje po zdravlje stanovništva i, istovremeno, uzrokuje masovne prekide proizvodnje i poslovanja, kao i veliku nezaposlenost, ograničenje kretanja i distribucije, smanjenje ponude i potražnje, prihoda i zarada. Ipak, pronalazak djelotvorne vakcine u drugoj polovini 2020. godine i započeta i dijelom sprovedena vakcinacija širom svijeta kojom se planira obuhvatiti oko 75% svjetske populacije, uz druge preventivne, prvenstveno zdravstvene mjere, po svemu sudeći naznačuju konačno suzbijanje ove pandemije. Međutim, bolest još uvijek hara, odnosi ljudske živote širom svijeta, uzrokuje ogromne ekonomske, finansijske i socijalne probleme sa velikim i, u ovom trenutku, teško predvidivim razmjerima, trajanjem i štetnim posljedicama.

Prema Allianzovom barometru rizika za 2021. godinu (Allianz Global Corporate & Specialty-AGCS, str. 2),<sup>1</sup> bolest uzrokovana virusom korona u 2020. godini je u samom vrhu svjetskih poslovnih rizika i istovremeno negativno utječe na ostale vodeće poslovne rizike u svijetu, među kojima su glavni: (1) zastoji u poslovanju, (2) pandemija COVID-19, (3) informatički rizici vezani za cyberkriminal,<sup>2</sup> (4) tržišna kretanja, naročito rizik povezan s porastom stopa insolventnosti, (5) promjene u zakonodavstvu i propisima, (6) prirodne katastrofe, (7) požari i eksplozije, (8) makroekonomska kretanja, (9) klimatske promjene, (10) politička nestabilnost

i nasilje, itd. AGCS-ov barometar rizika za 2021. (na str. 35) kao glavne poslovne rizike za male kompanije navodi: pandemiju virusa korona, cyber kriminal, prekide poslovanja, promjene propisa i zakonodavstva, tržišne promjene, makroekonomska kretanja, prirodne katastrofe, požare i eksplozije, političke rizike – nestabilnost, ratove, terorizam i klimatske promjene. Svim nabrojanim rizicima i negativnim utjecajima izložene su ekonomija i kompanije na globalnom i lokalnom nivou (izuzimajući nekoliko sektora, kao industriji lijekova i IT sektor, na koje aktualna kriza ima manji utjecaj, naprotiv, otvara im nova i povećava tržišta, prihode i zarade). U svijetu, a i lokalno, naročito su ugrožena mala i srednja preduzeća, i to prvenstveno u nerazvijenim, nestabilnim ekonomijama poput Bosne i Hercegovine, koja su zbog čestih zastoja u poslovanju, pada prihoda, poremećaja u snabdijevanju i u distribuciji, smanjenog izvoza dobara/usluga, nepovoljnih uslova za dobijanje kredita, nelikvidnosti, gubitaka u poslovanju i finansijske nestabilnosti, bez adekvatne pomoći države i entiteta izložena povećanom riziku od zatvaranja i bankrota. Mnoga mikropreduzeća u BiH već su nestala sa tržišta. AGCS-ov barometar za 2021. godinu među pet vodećih rizika koji prijete finansijskom sektoru u 2021. godini navodi: cyber kriminal, pandemiju virusa korona, prekide poslovanja, promjene propisa i zakonodavstva i makroekonomske promjene.

Za bosanskohercegovačku ekonomiju izloženost rizicima je naročito naglašena u pogledu pojačanog tržišnog rizika (pojačana nezvjesnost zbog pandemije i nestabilnosti, naročito dugogodišnje političke, odvraća investitore, smanjuje novčane prilive iz bosan-

<sup>1</sup> Allianz Global Corporate & Specialty (AGCS) realizuje istraživanje svjetskih poslovnih rizika u proteklih 10 godina, a zasniva se na analizama i mišljenjima 2.769 stručnjaka (glavni izvršni direktori, stručnjaci za upravljanje rizikom, brokri i stručnjaci za osiguranje) iz 92 zemlje i teritorija.

<sup>2</sup> Sve brža digitalizacija i učestalo online poslovanje (zbog pandemije) povećava izloženost informatičkim rizicima. Prema podacima američkog FBI, u aprilu 2020. godine cyber kriminal je povećan 300%, a procjenjuje se da cyber kriminal svjetskoj ekonomiji trenutno nanosi štete veće od bilion \$US, što je povećanje za 50% u odnosu na 2018/2019. godinu.

According to the value of assets, capital and realized insurance premiums, the insurance sector in BiH lags behind the insurance sector in the countries of the region, and especially behind the developed insurance industry of EU member states. Also, both impor-

tant financial sectors in BiH (banking and insurance) lag far behind the developed countries in terms of financial potential, as well as behind most countries in the region.

**Table 8.** Per capita premium in the EU27, in BiH and in neighboring countries

	2007.	2008.	2010.	2015.	2017.	2018.	2019.
Premium per capita EU 27 EUR	2.204	2.540	2.241	2.390	1.465	2.335	2.122
Premium per capita Croatia EUR	278	302	292	270	294	326	341
Premium per capita Serbia EUR	75	80	80	93	112	121	131
Premium per capita Montenegro EUR	82	96	99	124	131	140	152
Premium per capita in BiH EUR	54	60	64	80	100	135	112

Derived from: Insurance Agency of Bosnia and Herzegovina Statistics of insurance market in BiH –reports for 2007 – 2019 [https://euro-pa.eu/european-union/about-eu/countries/member-countries\\_hr](https://euro-pa.eu/european-union/about-eu/countries/member-countries_hr)

The weak competitiveness of the insurance sector stems from the overall unsatisfactory macroeconomic position of BiH.

**Table 9.** The position of the BH economy according to some indicators of global competitiveness

	2007/08	2008/09	2009/10	2010/11	2013/12	2016/15	2019/2018
	od 131	od 134	od 133	od 139	od 144	od 140	od 141
Global Competitiveness Index	106	107	109	102	88	111	92
Institutions	113	123	128	126	85	127	114
Macroeconomic stability	90	57	69	81	97	98	64
Market size	80	92	90	93	93	97	101
Commodity market efficiency	113	123	125	127	109	129	108
Technological readiness	110	109	95	85	68	79	80
Innovation and sophistication	123	129	127	120	99	120	117

Source: BiH Competitiveness Report 2019–2018, Faculty of Economics Sarajevo, Sarajevo

### 3. DISCUSSION

#### 3.1. The COVID 19 pandemic - a new systemic risk and threat

The COVID-19 pandemic during 2020 is still the cause of the global threat to the health of the population and, at the same time, causes mass interruptions in production and business, as well as high unemployment, restriction of movement and distribution, reduction of supply and demand, income and earnings. However, the discovery of an effective vaccine in the second half of 2020, and the vaccination started and partially implemented worldwide, which is planned to cover about 75% of the world's population, along with other preventive, primarily health measures, seem to indicate the final suppression of this pandemic. However, the disease is still rampant, taking human lives around the world, causing huge economic, financial and social problems with large and, at this moment, unpredictable scale, duration and harmful consequences.

According to The Allianz Risk Barometer for 2021 (Allianz Global Corporate & Specialty-AGCS, p. 2.)<sup>1</sup> the disease caused by coronavirus in 2020 is at the very top of global business risks and at the same time negatively affects other leading business risks in the world, among which are: (1) business downtime, (2) pandemic COVID-19, (3) IT risks related to cybercrime<sup>2</sup>, (4) market developments, in particular the risk associated with rising insolvency rates, (5) changes in legislation and regulations, (6) natural disasters, (7) fires and explosions, (8) macroeconomic developments, (9) climate change, (10) political instability and violence, etc. The

AGCS Risk Barometer for 2021 (on page 35) lists as major business risks for small companies: the coronavirus pandemic, cybercrime, business interruptions, changes in regulations and legislation, market changes, macroeconomic trends, natural disasters, fires and explosions, political risks — instability, wars, terrorism, and climate change. The economy and companies at the global and local levels are exposed to all these risks and negative impacts (except for a few sectors such as the pharmaceutical industry and the IT sector, which are less affected by the current crisis, on the contrary, opening new markets and increasing markets, revenues and earnings). In the world, and locally, small and medium companies are especially endangered, primarily in underdeveloped, unstable economies such as Bosnia and Herzegovina, which are due to frequent downtime, falling revenues, disruptions in supply and distribution, reduced exports of goods / services, unfavorable conditions for obtaining credit, illiquidity, operating losses and financial instability, without adequate assistance from the state and entities exposed to an increased risk of closure and bankruptcy. Many micro-enterprises in BiH have already disappeared from the market. The AGCS barometer for 2021 lists among the 5 leading risks threatening the financial sector in 2021: cyber crime, the coronavirus pandemic, business interruptions, changes in regulations and legislation, and macroeconomic changes.

For the BiH economy, risk exposure is particularly pronounced in terms of increased market risk (increased pandemic uncertainty and instability, especially long-term political discouragement of

<sup>1</sup> Allianz Global Corporate & Specialty (AGCS) has been conducting global business risk research over the past 10 years, based on analyzes and opinions of 2,769 experts (CEOs, risk management experts, brokers and insurance experts) from 92 countries and territories.

<sup>2</sup> Increasingly fast digitization and frequent online business (due to the pandemic) are increasing exposure to IT risks. According to the US FBI, in April 2020, cybercrime increased by 300%, and it is estimated that cybercrime is currently causing more than a billion US dollars in damage to the world economy, which is an increase of 50% compared to 2018/2019.

skohercegovačke dijaspori itd.), rizika od nelikvidnosti privrede, javnih i privatnih preduzeća, otpuštanja radnika i sve veće nezaposlenosti i, posljedično, nemogućnosti i/ili otežane otplate/naplate dospjele premije osiguranja, kreditnih, fiskalnih i drugih potraživanja/obaveza, što uzrokuje nelikvidnost u lancu, između ostalog povećava rizik nelikvidnosti (re)osiguravajućeg društva, delinkvenciju i broj nekvalitetnih – problematičnih kredita, što povećava kreditni rizik, a to će neminovno uzrokovati povećanje rizika od pada obrta, prihoda i zarada i gubitke u domaćem finansijskom sektoru (World Bank Group Zapadni Balkan, 2020), kao što se to već dešava na razvijenim finansijskim tržištima na kojima je pandemija virusa korona uzrokovala velike gubitke na berzama i značajno smanjenje vrijednosti kapitala, kao i značajno povećanje nekvalitetnih kredita (u pravilu su to krediti čija otplata kasni više od 90 dana). To potvrđuju pokazatelji problematičnih kredita (engl. Non-performing loans – NPL) u bankarskom sektoru u Europi u 2019. godini i očekivanja – predviđanje značajnog povećanja NPL racija u svim zemljama, a naročito u Italiji (sa 6,7 na 20,3) i u Španiji (sa 3,2 na 10,6) pod utjecajem pandemije COVID-19.<sup>3</sup> Prema podacima Svjetske banke, prosječno učešće NPL u ukupnim kreditima u 100 država u svijetu u 2019. godini bilo je 6,01%. Najveće učešće nekvalitetnih kredita je ostvareno u Ekvatorijalnoj Gvineji (48,81%), a najmanje u Makau (0,24%). Među 100 rangiranih država, BiH je zauzimala 22. mjesto, sa ostvarenih 7,41% učešća delinkventnih kredita u ukupnim bankarskim kreditima. U junu 2020. godine, NPL racio u BiH iznosio je 6,7%, a u prvom kvartalu je iznosio 6,6%. BiH je najveći NPL racio imala u decembru 2000. godine (21,2%), a najniži u junu 2008. godine (3,0%).

Prema podacima Agencije za nadzor osiguranja Federacije Bosne i Hercegovine (FBIH), utjecaj pandemije COVID-19 na tržište osiguranja u ovom entitetu, kumulativno u periodu od 1. 1. 2020. do 30. 11. 2020, uzrokovao je pad premije za 1,6% u odnosu na isti period 2019. godine, dok je mjesečna premija novembar 2020 / novembar 2019. smanjena za 2,1%. Pritom, samo pojedine vrste osiguranja, koje imaju vrlo malo učešće u ukupnoj premiji, nisu ostvarile pad premije, dok su glavne vrste osiguranja ostvarile znatan pad premije (01 – osiguranje od nezgode ostvarilo je pad za 27,3%; 02 – zdravstveno osiguranje imalo je pad premije za 7,6%; 03 – kasko auto-osiguranje imalo je pad za 7,1%; 08 – osiguranje od požara pad od 26,3%; 09 – ostala osiguranja imovine pad od 8,1%); dok su 07 – osiguranje robe u prevozu ostvarilo je rast premije za 10,6%; 10 – osiguranje od auto-odgovornosti imalo je rast za 8,1%. Na vrsti 19 – životno osiguranje, ostvaren je rast u odnosu na novembar 2019. godine za 12,3%.<sup>4</sup>

Prethodni podaci o globalnoj/lokalnoj socio-ekonomskoj krizi i rizicima potvrđuju da je pandemija virusa korona uzrokovala globalni sistemski rizik, neizvjestan po trajanju, razmjerima i štetnim posljedicama.

Kako procijeniti rizike i štete, kako smanjiti nivo neizvjesnosti i smanjiti buduće štete (pod utjecajem ove pandemije) u investicionom portfoliju industrije osiguranja u svijetu, uključujući i BiH, ključno je aktuelno pitanje i problem.

## ZAKLJUČAK

Uzroci ekonomskog zaostajanja, uključujući i sektor osiguranja, BiH iza zemalja u regionu i mnogo više u odnosu na razvijene članice i

prosjek EU, ne uzimajući u obzir pandemiju virusa korona, proističu i iz nedovoljnih postratnih investicija u privredi, konstantne političke nestabilnosti i izazivanja kriza, prestanka rada – nestanka brojnih privrednih subjekata i brojnih njihovih kooperanata u ratnom i poratnom periodu, velike nezaposlenosti, niskih plaća, rasta cijena roba/usluga, pada standarda i kupovne moći stanovništva. Od nekada uspješne, izvezno orijentirane privrede BiH, koja je ostvarivala kontinuirani rast i zapošljavala preko milion radnika, nakon rata 1992–1995, sve do sada, ostao je dezorijentiran i dezintegriran privredni sistem, veoma osjetljiv na najmanju krizu, sa nagomilanim, nezajajljivom administracijom i socijalnim davanjima iznad mogućnosti.

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<sup>4</sup> COVID-19 i tržište osiguranje u FBIH na 30. 11. 2020, <http://www.bosnare.ba/vijest/covid-19-i-trite-osiguranja-u-fbih-na-30-11-2020-103>.



investors, reduced cash inflows from the BiH diaspora, etc.), illiquidity of the economy risk, public and private enterprises, layoffs and increasing unemployment and consequent impossibility and / or difficult repayment / collection of due insurance premiums, credit, fiscal and other receivables / liabilities which causes illiquidity in the chain, among other things increases the risk of illiquidity of (re) insurance company, delinquency and number of non-performing loans which increases credit risk, and this will inevitably cause an increase in the risk of falling turnovers, revenues and wages and losses in the domestic financial sector (World Bank Group Western Balkans, 2020), as is already happening in developed financial markets where the coronavirus pandemic has caused large losses on stock exchanges and a significant decrease in the value of capital, as well as a significant increase in non-performing loans (as a rule, these are loans whose repayment is more than 90 days late). This is confirmed by the indicators of non-performing loans (NPLs) in the banking sector in Europe in 2019 and expectations - the forecast of a significant increase in NPL ratios in all countries, especially in Italy (from 6.7 to 20.3) and in Spain (from 3.2 to 10.6) affected by the Covid-19 pandemic.<sup>3</sup> According to the World Bank, the average share of NPLs in total loans in 100 countries in the world in 2019 was 6.01%. The largest share of non-performing loans was realized in Equatorial Guinea 48.81%, and the smallest in Macao 0.24%. Among the ranked 100 countries, BiH ranked 22nd with 7.41% share of delinquent loans in total bank loans. In June 2020, the NPL ratio in BiH was 6.7%, and in the first quarter it was 6.6%. BiH had the highest NPL ratio in December 2000 (21.2%) and the lowest in June 2008 (3.0%).

According to the Insurance Supervisory Agency of the Federation of Bosnia and Herzegovina (F BiH), the impact of Covid-19 on the insurance market in this entity, cumulatively in the period January 1, 2020 to November 30, 2020 caused a decrease in premiums by 1.6% compared to the same period 2019, while the monthly premium in November 2020 / November 2019 decreased by 2.1%. At the same time, only certain types of insurance that have a very small share in the total premium did not decrease in premiums, while the main types of insurance recorded a significant decrease in premiums (01 accident insurance decreased by 27.3%, 02 health insurance had a decrease in premiums for 7.6%, 03 comprehensive car insurance had a decrease of 7.1%, 08 fire insurance a decrease of 26.3%, 09 other property insurance a decrease of 8.1%), while 07 insurance of goods in transport increased premiums by 10.6%, 10 motor third party liability insurance grew by 8.1%. Type 19 life insurance increased by 12.3% compared to November 2019.<sup>4</sup>

Previous data on the global / local socio-economic crisis and risks confirm that the coronavirus pandemic has caused a global systemic risk uncertain in duration, scale and adverse consequences.

How to assess risks and damages, how to reduce the level of uncertainty and reduce future damages (under the influence of this pandemic) in the investment portfolio of the insurance industry in the world, including BiH, is a key current issue and problem?

## CONCLUSION

The causes of economic stagnation, including the BiH insurance sector, behind countries in the region and much higher than in de-

veloped members and the EU average, not taking into account the coronavirus pandemic, will also stem from insufficient post-war investments in the economy, constant political instability and crisis, downtime, the disappearance of numerous economic entities and their numerous subcontractors in the war and post-war period, high unemployment, low wages, rising prices of goods/services, falling standards and purchasing power of the population. From a once prosperous, export-oriented economy in BiH that has achieved continuous growth and employed over a million workers, after the 1992-1995 war, until now, the disoriented and disintegrated economic system has remained very sensitive to the slightest crisis, with accumulated, ineffable administration and social benefits that are granted beyond their own means.

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# Primena višedimenzionalnih pokazatelja za racionalnu analizu likvidnosti privrede Republike Srbije

## Application of multidimensional indicators for rational analysis of liquidity of the economy of the Republic of Serbia

### Rezime

Sam problem likvidnosti je „evergreen“ tema rasprave na različitim nivoima javnog, društvenog, naučnog, a posebno privrednog života, koja se uvek aktuelizuje u kriznim uslovima poslovanja, koji su danas izraženi, kako kod nas, tako i u svetu. Načelo likvidnosti sadrži osnovu kvalitetnog i uspešnog poslovanja i predstavlja ključ nesmetanog odvijanja procesa proizvodnje i prometa, sa aspekta priliva i odliva novčanih sredstava, pa stoga nije slučajno da se likvidnost poredi sa „pulsom“ koji odražava „zdravlje“ ili „oboljenje“ finansija preduzeća. Tradicionalna, statička dimenzija analize likvidnosti utemeljena na obračunskoj računovodstvenoj osnovi i relacijama može da posluži kao upozorenje na opasnost i posledice neracionalog disponiranja novca, ali ne i kao orijentacija za buduće novčane tokove. Moderna, dinamička, dimenzija analize likvidnosti utemeljena na „finansijskom mišljenju“ tretira likvidnost ne samo u datom trenutku već u toku odvijanja poslovanja preduzeća i okrenuta je u budućnost; ima se u vidu tretman stvarnih transakcija u prometu gotovine i njenih ekvivalenata (lišenih upotreba metoda procenjivanja vrednosti). Otuda se u praksi upravljanja likvidnosti generišu dileme oko izbora podesnog analitičkog modela, koji bi mogao odgovoriti narastajućim upravljačkim potrebama. Cilj rada je da se istakne kao relevantna integralna primena višedimenzionalnih pokazatelja za racionalnu analizu likvidnosti za period od 2017. do 2019. godine. Rezultati istraživanja na primeru izabranih preduzeća i delatnosti iz Republike Srbije pokazuju celishodnost preferiranja višedimenzionalnih pokazatelja za meritornu analizu likvidnosti.

**Ključne reči:** likvidnost, zaduženost, solventnost, Srbija.

### Abstract

The problem of liquidity itself is an “evergreen” topic of discussion at various levels of public, social, scientific, and especially economic life, which is always relevant in the crisis business conditions that are expressed today, both in our country and in the world. The principle of liquidity contains the basis of quality and successful business and is the key to the smooth running of the production and turnover process, from the aspect of cash inflows and outflows, so it is no coincidence that liquidity is compared to “pulse” which reflects “health” or “disease”. The traditional, static, dimension of liquidity analysis based on accrual accounting basis and relations can serve as a warning of the danger and consequences of irrational disposition of money, but not as an orientation for future cash flows. The modern, dynamic, dimension of liquidity analysis based on “financial opinion” treats liquidity not only at a given moment, but in the course of the company’s operations and is future-oriented; the treatment of actual transactions in cash transactions and its equivalents (deprived of the use of valuation methods) is taken into account. Hence, in the practice of liquidity management, dilemmas are generated on the choice of a suitable analytical model, which could respond to management needs. The aim of this paper is to highlight a relevant integral application of multidimensional indicators for rational liquidity analysis for the period from 2017 to 2019. The results of the research on the example of selected companies and activities from the Republic of Serbia show the expediency of preferring multidimensional indicators for meritorious liquidity analysis.

**Keywords:** liquidity, indebtedness, solvency, Serbia.

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## UVOD

Nesporno je da likvidnost predstavlja probni kamen finansijskog poslovnog partnerstva na osnovu koga jača poslovno poverenje ili se ono napušta. Koliko je značajan ovaj aspekt analize finansija za svako preduzeće, bez obzira na njegovu veličinu, delatnost odnosno tipologiju, potvrđuje činjenica da duži prekidi ili pak nemogućnost nesmetanog odvijanja ovih finansijskih odnosa dovode preduzeće u poziciju stečaja.

Dakle, u fokusu analize likvidnosti jeste operativno pulsiranje internih i eksternih finansijskih odnosa. Drugim rečima, u pitanju je najvidljiviji sloj složenih finansijskih odnosa koji su rezultat dinamike i međuzavisnosti promena kratkoročne i dugoročne finansijske ravnoteže u odvijanju poslovnih aktivnosti preduzeća.

Splet finansijskih odnosa preduzeća kao kompleksnog sistema u okruženju i njihovo ispitivanje u finansijskoj analizi nije jednostavan, naprotiv, on je kompleksan, i ne samo da zahteva uvažavanje specifičnosti preduzeća već ne dopušta da se finansijska analiza odvija „bez kompasa“, odnosno bez adekvatnog analitičnog instrumentarijuma.

Okvir za analizu likvidnosti temelji se na određenim instrumentarijima i metodskim postupcima, i to sa (Čavlin, 2004):

- kvantitativnog aspekta odnosa veličina koje determinišu pokazatelje likvidnosti, vrednujući validnost datih koeficijenata u odnosu na prihvaćene standarde (veličine – koeficijente);
- kvalitativnog aspekta ispitivanja i ocene likvidnosti konvertovanja likvidne imovine u novčani oblik i dospećem kratkoročnih obaveza – te njihovog usklađivanja; to se čini korišćenjem novčanog toka, odnosno gotovinskog ciklusa i njegovih pokazatelja.

Tek racionalnim povezivanjem i kritičkom ocenom rezultata analize likvidnosti sa navedenih aspekata može se računati na relevantnu (jezgrovit) produkciju korisnih informacija za meritorno odlučivanje o likvidnosti.

Predmet ovog rada uključuje analizu pokazatelja relevantnih za celovitu ocenu likvidnosti i identifikaciju pozicije likvidnosti u određenim delatnostima i preduzećima u Republici Srbiji. U skladu sa navedenim predmetom, sledeći su ciljevi koji su obuhvaćeni ovim radom, a to su:

- pregled tipičnih postavki koje se primenjuju u analizi likvidnosti,
- analiza likvidnosti i zaduženosti odabranih delatnosti u Republici Srbiji, i
- analiza međuzavisnosti izabranih pokazatelja likvidnosti preduzeća.

Naša polazna hipoteza jeste opravdanost integralne primene statičkih i dinamičkih, tj. višedimenzionalnih i međuzavisnih pokazatelja kao neophodne systemske analitičke aparature za racionalnu analizu likvidnosti, a na primeru odabranih višedimenzionalnih pokazatelja likvidnosti za reprezentativne delatnosti privrede Republike Srbije. Da bi se ostvario cilj rada, uz analizu relevantne literature, u teorijskim aspektima sažeto su prikazane tipične postavke za analizu likvidnosti, data je ocena pozicije likvidnosti za izabrana preduzeća i delatnosti u Republici Srbiji, pri čemu su za izračunavanje pokazatelja korišteni podaci iz zvaničnih finansijskih izveštaja preduzeća u Republici Srbiji za period od 2017. do 2019. godine i izvršena analiza međuzavisnosti između izabranih pokazatelja likvidnosti, pri čemu su korištene deskriptivne i statističke metode.

## 1. METODOLOGIJA ISTRAŽIVANJA

Istraživanje u radu obuhvata analizu ključnih parametara likvidnosti i solventnosti preduzeća u Republici Srbiji za period od 2017. do 2019. godine. Za potrebe istraživanja oblikovan je uzorak preduzeća koja su klasifikovana na područja delatnosti poslovnim strukturnim statistikama Republičkog zavoda za statistiku Srbije, a pokazatelji su izvedeni iz javno dostupnih informacija odnosno zvaničnih finansijskih izveštaja koje su predmetna preduzeća dostavila Agenciji za privredne registre Republike Srbije, te iz neposrednog uvida u izveštaje preduzeća. Prema dostupnim podacima, od ukupnog broja preduzeća koja su pripremila i predala godišnje finansijske izveštaje, a za potrebe istraživanja, uvažavajući kriterijum delatnosti, oblikovan je uzorak i prikupljeni su relevantni podaci za trogodišnji period 2017–2019.

Korelaciona analiza primenjena je u svrhu ispitivanja stepena kvantitativnog slaganja varijabiliteta analiziranih varijabli. U osnovnom skupu koeficijent korelacije obeležava se sa  $\rho$ , a u uzorku sa  $r$ . Za uzoračke opservacije  $(x_i, y_i)$ ,  $i = 1, 2, \dots, n$ , koeficijent korelacije izračunava se po formuli:

$$r = \frac{\sum x_i y_i - n \cdot \bar{x} \cdot \bar{y}}{\sqrt{(\sum x_i^2 - n \cdot \bar{x}^2) \cdot (\sum y_i^2 - n \cdot \bar{y}^2)}}$$

Stepen povezanosti izražava se koeficijentom korelacije  $r$ . Vrednost koeficijenta korelacije kreće se u granicama od -1 (potpuno negativna povezanost) do 1 (potpuno pozitivna povezanost). Statističku značajnost koeficijenta korelacije možemo sprovesti na dva načina: preko  $t$ -vrednosti i upoređivanjem dobijenog  $r$  sa graničnom vrednošću  $r$  očitanom iz tablice. Kako navode autori Radović Marković i Hanić (2018), istinitost istraživačke hipoteze da između dve varijable postoji korelacija odnosno da je veza  $X$  i  $Y$  značajna (signifikantna) formalno se sprovodi procedurom testiranja nulte hipoteze da je koeficijent linearne korelacije jednak nuli, pri čemu se koristi sledeća statistika  $t$ -testa:

$$t = \sqrt{\frac{n-2}{1-r^2}}$$

## 2. PREGLED LITERATURE I POSTAVKE ZA ANALIZU LIKVIDNOSTI PREDUZEĆA

Vlade, centralne banke i regulatorna tela trude se da pospeše likvidnost na tržištu, uvodeći nove mere monetarne i finansijske politike, poreske olakšice, kao i druge mere za ublažavanje posledica COVID-19, koji je prouzrokovao oštre kontrakcije u ekonomskom razvoju, smanjenje likvidnosti i otežan pristup kapitalu (Vapa Tankosić, Čavlin i Buđevac, 2020). Swop linije centralnih banaka takođe olakšavaju pružanje adekvatnog nivoa devizne likvidnosti bankarskom sistemu kao neku vrstu „zadnjeg utočišta“, pod povoljnijim uslovima od tržišnih uslova (Kiss et al., 2020). Trenutna finansijska situacija i volatilnost koja utiče na globalna tržišta zahteva očuvanje specijalizovanih institucija koje imaju ulogu „osiguranih zadnjeg utočišta“ i koje podržavaju transakcije koje poslovne banke samostalno ne mogu da podrže (Vapa Tankosić i Vukosavljević, 2021). Rezultati istraživanja pokazuju da MSP smatraju da finansijski oblici podrške utiču na sposobnost i konkurentnost MSP i da najveći broj ispitanika najviše vrednuje korist od državnih institucija u obliku finansijske podrške (Vapa Tankosić et al., 2020).

U lokalnoj ekonomskoj literaturi postoje brojna istraživanja na temu likvidnosti, među kojima se ističe doprinos koji su dali Rodić

## INTRODUCTION

It is indisputable that liquidity is the foundation of a financial business partnership on the basis of which business confidence is strengthened or abandoned. How important this aspect of financial analysis is for every company, regardless of its size, activity or typology, is confirmed by the fact that longer interruptions or the impossibility of unhindered development of these financial relations puts the company in a position of bankruptcy.

Thus, the focus of liquidity analysis is the operational pulsation of internal and external financial relations. In other words, it is the most visible layer of complex financial relations that are the result of the dynamics and interdependence of changes in short-term and long-term financial balance in the course of business activities of the company.

The set of financial relations of the company as a complex system in the environment and their examination in financial analysis is not simple, on the contrary, it is complex, and not only requires respect for the specifics of the company, but does not allow financial analysis to take place “without compass”, that is, without adequate analytical tools.

The framework for liquidity analysis is based on certain instruments and methodological procedures, as follows: (Čavlin, 2004):

- quantitative aspect of the ratio of variables that determine liquidity indicators, evaluating the validity of given coefficients in relation to accepted standards (variables - coefficients);
- qualitative aspect of testing and assessment of liquidity of converting liquid assets into cash and maturity of short-term liabilities - and their adjustment; this is done by using the cash flow, ie the cash cycle and its indicators.

Only by rational linking and critical evaluation of the results of liquidity analysis from the above aspects can we count on the relevant (concise) production of useful information for meritorious decision-making on liquidity.

The subject of this paper includes the analysis of indicators relevant for the overall assessment of liquidity and the identification of the liquidity position in certain activities and companies in the Republic of Serbia. In accordance with the above subject, the following goals are covered by this paper, and they are:

- an overview of typical assumptions applied in liquidity analysis,
- analysis of liquidity and indebtedness of selected activities in the Republic of Serbia, and
- analysis of the interdependence of selected liquidity indicators of the company.

Our initial hypothesis is the justification of the integral application of static and dynamic, ie. multidimensional and interdependent indicators as necessary system analytical apparatus for rational liquidity analysis, and on the example of selected multidimensional liquidity indicators for representative activities of the economy of the Republic of Serbia. In order to achieve the goal of the paper, along with the analysis of relevant literature, in theoretical aspects, typical settings for liquidity analysis are summarized, liquidity position assessment for selected companies and activities in the Republic of Serbia is given, using data from official company financial statements in the Republic of Serbia for the period from 2017 to 2019, and an analysis of the interdependence between selected liquidity indicators was performed, using descriptive and statistical methods.

## 1. RESEARCH METHODOLOGY

The research includes an analysis of key parameters of liquidity and solvency of companies in the Republic of Serbia for the period from 2017 to 2019. For the purposes of the research, a sample of companies classified in the areas of business structural statistics of the Republic Statistical Office of Serbia was formed, and the indicators were derived from publicly available information or official financial reports submitted by the companies to The Serbian Business Registers Agency, as well as directly using companies' reports. According to the available data, from the total number of companies that prepared and submitted annual financial reports, and for the purposes of the research, taking into account the activity criteria, a sample was formed and relevant data for the three-year period 2017-2019 were collected.

Correlation analysis was applied to examine the degree of quantitative correlation of the variability of the analyzed variables. In the basic set, the correlation coefficient is denoted by  $\rho$ , and in the sample by  $r$ . For sample observations  $(x_i, y_i), i= 1, 2, \dots, n$  the correlation coefficient is calculated using the formula:

$$r = \frac{\sum x_i y_i - n \cdot \bar{x} \cdot \bar{y}}{\sqrt{(\sum x_i^2 - n \cdot \bar{x}^2) \cdot (\sum y_i^2 - n \cdot \bar{y}^2)}}$$

The degree of correlation is expressed by the correlation coefficient,  $r$ . The value of the correlation coefficient ranges from -1 (completely negative correlation) to 1 (completely positive correlation). The statistical significance of the correlation coefficient can be carried out in two ways: through the t-value and by comparing the obtained  $r$  with the limit value  $r$  read from the table. As stated by the authors Radovic-Markovic and Hanic (2018), the truth of the research hypothesis that there is a correlation between the two variables, ie that the relationship  $X$  and  $Y$  is significant (significant) is formally carried out by testing the null hypothesis that the linear correlation coefficient is zero using the following t test statistics:

$$t = \sqrt{\frac{n-2}{1-r^2}}$$

## 2. LITERATURE REVIEW AND SETTINGS FOR COMPANY LIQUIDITY ANALYSIS

Governments, central banks and regulators are working to boost market liquidity by introducing new monetary and financial policy measures, tax breaks and other mitigation measures Covid-19, which has caused sharp contractions in economic development, reduced liquidity and access to capital (Vapa Tankosic, Cavlin and Budjevac, 2020). Central banks' swap lines also make it easier to provide an adequate level of foreign exchange liquidity to the banking system as a kind of “last resort”, under more favorable conditions than market conditions (Kiss et al. 2020). The current financial situation and volatility affecting global markets requires the preservation of specialized institutions that have the role of “last resort insurers” that support transactions that commercial banks cannot support on their own (Vapa Tankosic and Vukosavljevic, 2021). The results of the research show that SMEs believe that financial forms of support affect the ability and competitiveness of SMEs and that the largest number of respondents most value the benefits of state institutions in the form of financial support. (Vapa Tankosic et al., 2020).

In the local economic literature, there are numerous researches on the topic of liquidity, emphasizing the contribution of Rodic (2003),



(2003), Malešević (2014), Stevanović et al. (2011), Mikerević et al. (2015), Tintor (2009), Belak (2014) i Žager et al. (2017). Analizom dosadašnjih istraživanja pokazuje se da su u lokalnoj ekonomskoj literaturi još uvek nedovoljno zastupljeni radovi u kojima se nastoji, primenom statističkih metoda, uvažavajući određena ograničenja, iznaći naoptimalniji model za analizu likvidnosti radi racionalnijeg upravljanja preduzećem. Finansijski pokazatelji se, prema istorijskom osvrtnu koji iznosi Horrigen (1968), već dugo primenjuju u analizi likvidnosti. Tokom vremena, teorija i praksa analize likvidnosti se razvijala, usled narastajućih potreba upravljanja u tržišno orijentisanim preduzećima, čemu su doprinela istraživanja mnogobrojnih

autora, među kojima izdvajamo sledeće: Altman (1968), Plewa i Friedlob (1995), Coyle (2000), Shim i Siegel (2019), Soprano (2015). Njihova primena omogućava analizu u različitim kontekstima i u različitim dimenzijama.

Ipak, treba istaći da je likvidnost pojmovno i sadržinski stalni predmet rasprave i teorije i prakse, gde se ispoljavaju izvesne razlike, najčešće povezane sa solventnosti (Proklin i Zima, 2011), pa iz toga razloga, u kontekstu ovog istraživanja, radi jasnijeg razumevanja, ističemo njihovu suštinu kroz sledeći prikaz, dat u tabeli 1:

**Tabela 1.** Ključne razlike između likvidnosti i solventnosti

Kriterijum poređenja	Likvidnost	Solventnost
Određenje	Likvidnost ukazuje na sposobnost izmirenja kratkoročnih dospelih obaveza	Solventnost ukazuje na sposobnost preduzeća da ima dovoljno imovine da dugoročno podmiri svoje dugove
Značaj	Govori kako se brzo kratkoročna imovina preduzeća može konvertovati u gotovinu	Nesolventnost može rezultirati bankrotom preduzeća
Orijentacija na obaveze	Kratkoročna	Dugoročna
Operativni izazovi	Kada preduzeće nije u mogućnosti da svoju imovinu brzo pretvori u gotovinu	Kad preduzeće nema dovoljno imovine za izmirenje obaveza
Osnovna funkcija	Izmiriti kratkoročno dospеле obaveze raspoloživom likvidnom imovinom	Da se održava finansijsko zdravlje preduzeća kako bi se na vreme ispunile dužničke obaveze

Izvor: obrada autora

Dakle, za potrebe istraživanja možemo sumirati da se pojam likvidnosti odnosi na (Malešević, Čavlin, 2020):

- likvidnost preduzeća, i
- likvidnost imovine, i to sa aspekta: finansijske imovine, poslovne imovine i obrtne imovine.

Likvidnost preduzeća definiše se kao sposobnost preduzeća da pravovremeno izmiruje dospеле kratkoročne obaveze raspoloživom likvidnom imovinom na način koji omogućava nesmetano odvijanje tokova poslovanja preduzeća, kako materijalnih tako i finansijskih, u određenom skladu, bez zastoja.

Likvidnost imovine definiše se funkcionalnom sposobnošću pojedinih delova obrtne i ukupne imovine (njenih materijalnih i prelaznih oblika) da se izvesno (bez većih gubitaka) mogu pretvoriti u svoj početni – novčani oblik.

Pritom razlikujemo njene sledeće oblike: likvidnost finansijske imovine ili instrumenata (Orsag, 2012), poslovne imovine i obrtne imovine (Block, Hirt i Danielsens, 2016).

Sa druge strane, solventnost se može shvatiti kao sposobnost preduzeća da uredno izmiruje svoje obaveze (kratkoročne i dugoročne) i održava stabilno poslovanje u predvidivoj budućnosti (na duži rok). Stoga se može prihvatiti da se solventnost preduzeća tretira kroz sledeće dimenzije, dvojako, i to kao (Malešević, Čavlin, 2020):

- statička solventnost – sposobnost da se unovčavanjem raspoložive ukupne imovine, makar i po likvidacionoj vrednosti, podmiri ukupne obaveze preduzeća. Drugim rečima, orijentacija je pitanje (pre)zaduženosti odnosno pokazuje da li sadašnja pravična tržišna, odnosno likvidaciona vrednost celokupne imovine preduzeća može da pokrije obaveze, tj. da bude veća od sadašnje vrednosti svih njegovih obaveza;
- dinamička (platežna) solventnost – sposobnost preduzeća da u predvidivoj budućnosti, tj. na duži rok izmiruje sve svoje obaveze, uključujući i dugoročne, u rokovima njihovog dospeća, bez

zastoja u poslovanju i većih gubitaka u unovčavanju imovine preduzeća. Drugim rečima, fokusira se na uredno izmirivanje dugoročnih finansijskih obaveza preduzeća.

### 2.1. Postavke za tipičnu analizu likvidnosti

Shvatanje i pojmovno definisanje likvidnosti preduzeća iskazuje se opštim pokazateljem ili odnosom: likvidna imovina / kratkoročne obaveze. Dati analitičko-matematički pokazatelj, odnosno merilo, izražava definisani opšti pojam likvidnosti. Za analizu likvidnosti dati odnos jeste polazište u smislu definisanog pojma likvidnosti. Njegova temeljnija analiza podrazumeva dekomponovanje datog odnosa – pokazatelja na više izvedenih pokazatelja likvidnosti koji će omogućiti temeljniju i validnu analizu likvidnosti. Analiza likvidnosti zasniva se na sledećim postavkama (Malešević, Čavlin, 2020):

1. analiza i rangiranje likvidne imovine i kratkoročnih obaveza, a analiza likvidnosti vrši se na osnovu diferenciranja:
  - a) likvidne imovine po stepenu njene unovčivosti, i
  - b) kratkoročnih izvora (obaveza) po roku dospeća plaćanja;
2. analiza likvidnosti preduzeća, koja se realizuje na osnovu sledećih postavki:
  - a) trenutne likvidnosti,
  - b) likvidnosti preduzeća na obračunskoj osnovi (statička),
  - c) likvidnosti preduzeća na gotovinskoj osnovi (dinamička).

### 2.2. Postavke za tipičnu analizu solventnosti

Solventnost određuje koliko dobro preduzeće dugoročno održava svoje poslovanje, a zasniva se na sledećim postavkama (Malešević, Čavlin, 2020):

1. Statička analiza solventnosti polazi od ispitivanja finansijskih odnosa između poslovne imovine i dugova, koji se izražavaju sledećim odnosima: poslovna imovina / dugovi odnosno dugovi / poslovna imovina.

Malesevic (2014), Stevanovic et al. (2011) Mikerevic et al. (2015) Tintor (2009), Belak (2014) and Zager et al. (2017). The analysis of previous research shows that in the local economic literature there are still insufficiently represented works in which the application of statistical methods, respecting certain limitations, seeks to find the most optimal model for liquidity analysis for more rational management of the company. According to the historical review presented by Horrigen (1968), financial indicators have long been used in liquidity analysis. Over time, the theory and practice of liquidity analysis has evolved, due to the growing needs of management in market-oriented companies, which has contributed to the research

of numerous authors, including Altman (1968); Plewa and Friedlob (1995), Coyle (2000), Shim and Siegel (2019) Soprano (2015). Their application enables analysis in different contexts and in different dimensions.

However, it should be noted that liquidity is conceptually and substantively a constant subject of discussion and theory and practice where certain differences are most often associated with solvency (Proklin and Zima, 2011), and therefore, in the context of this research, for a clearer understanding, we emphasize their essence through the following presentation given in Table 1:

**Table 1.** Key differences between liquidity and solvency

<b>Comparison criterion</b>	<b>Liquidity</b>	<b>Solvency</b>
<i>Determination</i>	<i>Liquidity indicates the ability to settle short-term overdue liabilities</i>	<i>Solvency indicates the ability of a company to have sufficient assets to settle its debts in the long run</i>
<i>Significance</i>	<i>It shows how quickly a company's short-term assets can be converted into cash</i>	<i>Insolvency can result in the bankruptcy of a company</i>
<i>Commitment orientation</i>	<i>Short-term</i>	<i>Long-term</i>
<i>Operational challenges</i>	<i>When a company is not able to quickly turn its assets into cash</i>	<i>When the company does not have enough assets to settle its obligations</i>
<i>Basic function</i>	<i>Settle short-term liabilities with available liquid assets</i>	<i>To maintain the financial health of the company in order to fulfill the debt obligations on time</i>

Source: edited by the author

Thus, for the purposes of research, we can summarize that the term liquidity refers to (Malesevic, Cavlin, 2020):

- liquidity of the company, and
- liquidity of assets, from the aspect of: financial assets, business assets and current assets.

The liquidity of the company is defined as the ability of the company to timely settle due short-term liabilities with available liquid assets in a way that allows the smooth flow of business flows of the company, both material and financial, in a certain fund without delay.

The liquidity of an asset is defined by the functional ability of certain parts of current and total assets (its material and transitional forms) to be able to transform (without major losses) into their initial - monetary form.

We distinguish its following forms: liquidity of financial assets or instruments (Orsag, 2012), business assets and current assets (Block, Hirt and Danielsen, 2016):

On the other hand, solvency can be understood as the ability of a company to properly settle its obligations (short-term and long-term) and maintain stable operations in the foreseeable future (in the long run). Therefore, it can be accepted that the solvency of a company is treated through the following dimensions, in two ways, as (Malesevic, Cavlin, 2020):

- Static solvency - the ability to liquidate the available total assets, even at liquidation value, to settle the total liabilities of the company. In other words, orientation is a question of (over) indebtedness, ie it shows whether the current fair market, ie liquidation value of the entire property of the company can cover the obligations, ie. to be greater than the present value of all his obligations.
- Dynamic (payment) solvency - the ability of a company to, in the foreseeable future, ie. in the long run, settle all its obligations, including long-term ones, within their maturity, without

downtime and major losses in the realization of the company's assets. In other words, it focuses on the orderly settlement of long-term financial obligations of the company.

**2.1. Settings for a typical liquidity analysis**

The understanding and conceptual definition of a company's liquidity is expressed by a general indicator or ratio: liquid assets / short-term liabilities. The given analytical-mathematical indicator, ie measure, expresses the defined general notion of liquidity. For the analysis of liquidity, the given starting point is given in the sense of the defined notion of liquidity. Its more thorough analysis implies the decomposition of a given ratio - indicators into several derived liquidity ratios that will enable a more thorough and valid analysis of liquidity. Liquidity analysis is based on the following settings (Malesevic, Cavlin, 2020):

1. analysis and ranking of liquid assets and short-term liabilities, and liquidity analysis is performed on the basis of differentiation:
  - a) liquid assets by the degree of their liquidity, and
  - b) short-term sources (liabilities) after the due date of payment.
2. liquidity analysis of the company, and the liquidity analysis of the company is realized on the basis of the following settings:
  - a) current liquidity,
  - b) liquidity of the company on an accrual basis (static),
  - c) liquidity of the company on a cash basis (dynamic).

**2.2. Settings for typical solvency analysis**

Solvency determines how well a company maintains its business in the long run, and is based on the following settings (Malesevic, Cavlin, 2020):

1. static solvency analysis starts from the examination of financial relations between business assets and debts, which are repre-

Prvi izraz iskazuje opštu solventnost, drugi iskazuje zaduženost preduzeća, a postavka i tok analize solventnosti bazira se na analizi sledećih relacija:

- a) solventnosti (opšte i optimalne),
- b) zaduženosti,
- c) finansijske stabilnosti.

2. Dinamička analiza solventnosti zasniva se na sledećim postavkama, sa jedne strane bazirajući se na analizi sledećih relacija:

- a) finansijske moći,
  - b) faktora zaduženosti, i
  - c) indeksa finansijske poluge,
- a sa druge strane na analizi:
- d) pokrivenosti ukupnih obaveza novčanim tokom iz poslovanja, i
  - e) pokrivenosti kamata novčanim tokom iz poslovanja.

**Tabela 2.** Pregled tipičnih statičkih i dinamičkih pokazatelja likvidnosti i solventnosti

<b>Statički pokazatelji likvidnosti i solventnosti</b>	
Pokazatelj efektivne likvidnosti	gotovina + novčani kratkoročni ekvivalenti + kratkoročna potraživanja / kratkoročne obaveze
Pokazatelj trenutne likvidnosti	(gotovina + kratkoročne hartije od vrednosti) / kratkoročne obaveze
Pokazatelj perspektivne likvidnosti	ukupna obrtna imovina / kratkoročne obaveze
Pokazatelj opšte solventnosti	poslovna imovina / ukupne obaveze
Pokazatelj ukupne zaduženosti	ukupne obaveze / ukupna imovina
Pokazatelj finansijske stabilnosti	kapital + rezerve + dugoročne obaveze / dugoročna imovina
<b>Dinamički pokazatelji likvidnosti i solventnosti – „novčani tok“</b>	
Pokazatelj pokrivenosti kratkoročnih obaveza novčanim tokom iz poslovanja	novčani tok iz poslovnih aktivnosti / prosečne kratkoročne obaveze
Defanzivni interval likvidne imovine	(obrotna imovina – zalihe) / prosečna dnevna gotovina iz poslovnih aktivnosti
Pokazatelj broja dana „gotovine u rukama“	gotovina i trenutno unovčljive hartije od vrednosti / prosečni dnevni gotovinski odlivi za operativne troškove
Prosečan period trajanja gotovinskog ciklusa	prosečan period trajanja zaliha + prosečan period trajanja potraživanja od kupaca – prosečan period isplate dobavljača
Prosečno vreme isplate dobavljača	dobavljači x 365 / godišnja nabavka
Prosečan period trajanja zaliha	zalihe x 365 / prodaja
Prosečno vreme trajanja potraživanja	potraživanja x 365 / prodaja
Pokrivenost troškova kamata	poslovni rezultat (engl. „EBIT“) / troškovi kamata
Pokrivenost ukupnih fiksnih obaveza	(poslovni rezultat + troškovi zakupa) / troškovi kamata + troškovi zakupa + dospela glavnica dugoročnog duga + preferencijalna dividenda* (1 / (1 - poreska stopa na finansijski rezultat izražena decimalnim brojem))
Faktor zaduženosti	ukupne obaveze / (zadržana dobit + amortizacija)
Pokazatelj solventnosti novčanih tokova	novčani tok iz poslovnih aktivnosti / prosečne ukupne obaveze

Izvor: obrada autora

### 3. REZULTATI ISTRAŽIVANJA I DISKUSIJA

Uzorak obuhvata preduzeća raspoređena prema delatnostima na sledeći način: sektor Poljoprivreda, šumarstvo i ribarstvo (u nastavku

teksta: sektor A), sektor Prerađivačka industrija (sektor B) i sektor Trgovina na veliko i trgovina na malo, popravka motornih vozila i motocikala (sektor C). Struktura poslovnog prihoda, neto dobiti/gubitka po sektorima u Republici Srbiji 2017–2019. data je u tabeli 3.

**Tabela 3.** Struktura poslovnog prihoda, neto dobiti/gubitka po sektorima u Republici Srbiji za 2017–2019.

	Sektor A	Sektor B	Sektor C	Zbir A + B + C	%	Svi poslovni sektori RS
<b>2019.</b>						
Poslovni prihodi	331.315.773,00	3.152.191.576,00	4.454.973.987,00	7.938.481.336,00	62,98%	12.604.409.590,00
Neto dobitak	17.884.413,00	189.269.592,00	146.701.882,00	353.855.887,00	51,24%	690.537.135,00
Neto gubitak	22.291.339,00	62.479.737,00	61.029.111,00	145.800.187,00	51,63%	282.418.681,00
<b>2018.</b>						
Poslovni prihodi	327.735.001,00	3.048.126.827,00	3.854.967.017,00	7.230.828.845,00	64,56%	11.199.793.391,00

ssed by the following relations: business assets/debts or debts/business assets

The first expression expresses the general solvency, and the second expresses the indebtedness of the company, and the setting and course of the solvency analysis is based on the analysis of the following relations:

- solvency (general and optimal),
- indebtedness,
- financial stability.

2. dynamic solvency analysis is based on the following settings, on the one hand based on the analysis of the following relations:

- financial power,
- indebtedness factors, and
- leverage index, and on the other hand on the analysis:
- coverage of total liabilities by cash flows from operations, and
- interest coverage by cash flow from operations.

**Table 2.** An overview of typical static and dynamic liquidity and solvency ratios

Static indicators of liquidity and solvency	
Effective liquidity ratio	cash + cash short-term equivalents + short-term receivables / short-term liabilities
Current liquidity ratio	(cash + short-term securities) / short-term liabilities
Perspective liquidity indicator	total current assets / current liabilities
General solvency ratio	operating assets / total liabilities
An indicator of total indebtedness	total liabilities / total assets
Financial stability indicator	capital + reserves + long-term liabilities / long-term assets
Dynamic indicators of liquidity and solvency - "cash flow"	
Indicator of coverage of short-term liabilities by cash flow from operations	cash flow from operating activities / average short-term liabilities
Defensive interval of liquid assets	(current assets - inventories) / average daily cash from operating activities
"Cash in hand" indicator	cash and current redeemable securities / average daily cash outflows for operating expenses
Average cash cycle duration	average period of inventory duration + average period of trade receivables - average payment period of suppliers
Average supplier payout time	suppliers x 365 / annual procurement
Average stock life	stock x 365 / sale
Average duration of receivables	receivables x 365 / sales
Interest cost coverage	operating result ("EBIT") / interest expenses
Coverage of total fixed liabilities	(operating result + lease costs) / interest costs + lease costs + due principal of long-term debt + preferential dividend * (1 / (1-tax rate on the financial result expressed in decimal numbers))
Indebtedness factor	total liabilities / (retained earnings + depreciation)
Cash flow solvency ratio	Cash flow from operating activities / average total liabilities

Source: edited by the author

### 3. RESEARCH RESULTS AND DISCUSSION

The sample includes companies distributed by activities as follows: Sector: Agriculture, forestry and fisheries from companies (hereinafter: Sector A), Sector: Manufacturing (hereinafter: Sector B) and

Sector: Wholesale and retail trade; repair of motor vehicles and motorcycles (hereinafter: Sector C). The structure of operating income, net profit/loss by sectors in the Republic of Serbia in the period 2017-2019 is given in Table 3.

**Table 3.** Structure of operating income, net profit / loss by sectors in the Republic of Serbia in 2017-2019

	Sector A	Sector B	Sector C	Sum A+B+C	%	All sectors in RS
<b>2019</b>						
Operating income	331.315.773,00	3.152.191.576,00	4.454.973.987,00	7.938.481.336,00	62,98%	12.604.409.590,00
Net profit	17.884.413,00	189.269.592,00	146.701.882,00	353.855.887,00	51,24%	690.537.135,00
Net loss	22.291.339,00	62.479.737,00	61.029.111,00	145.800.187,00	51,63%	282.418.681,00
<b>2018</b>						
Operating income	327.735.001,00	3.048.126.827,00	3.854.967.017,00	7.230.828.845,00	64,56%	11.199.793.391,00



Neto dobitak	31.440.007,00	172.799.451,00	120.369.513,00	324.608.971,00	44,00%	737.717.856,00
Neto gubitak	33.691.567,00	71.265.183,00	42.986.238,00	147.942.988,00	54,25%	272.713.098,00
2017.						
Poslovni prihodi	309.777.042,00	2.913.604.544,00	3.623.853.541,00	6.847.235.127,00	65,77%	10.411.552.581,00
Neto dobitak	18.491.709,00	230.857.892,00	125.354.577,00	374.704.178,00	56,06%	668.429.274,00
Neto gubitak	11.198.430,00	85.490.505,00	49.113.973,00	145.802.908,00	52,30%	278.774.483,00

Izvor: obrada autora

Prema objavljenim podacima, preduzeća koja su predala godišnje finansijske izveštaje za 2019. godinu ostvarila su ukupno 7.938.481.336,00 dinara prihoda od prodaje, što predstavlja 62,98% ukupnog prometa odnosno 51,24% neto dobitka svih aktivnih

preduzeća. Slična situacija je u celom istraživanom periodu. S obzirom na to, dobijeni rezultati mogu se smatrati reprezentativnim za usvajanje zaključaka.

**Tabela 4.** Pregled pokazatelja likvidnosti i solventnosti u Republici Srbiji za 2017–2019.

Pokazatelj	Period	Sektor A	Sektor B	Sektor C	Prosek sektora A, B i C	Prosek svih sektora
Perspektivna likvidnost (tekući racio likvidnosti)	2019.	1,02	1,05	1,13	1,07	0,94
	2018.	0,96	0,99	1,12	1,02	0,95
	2017.	0,94	0,94	1,07	0,98	0,91
Efektivna likvidnost (rigorozni racio)	2019.	0,60	0,64	0,67	0,63	0,10
	2018.	0,56	0,60	0,67	0,61	0,76
	2017.	0,54	0,57	0,64	0,58	0,73
Gotovinski ciklus (u danima)	2019.	89,42	78,25	45,95	71,21	112,65
	2018.	83,03	75,46	43,25	67,25	106,09
	2017.	90,60	70,19	40,64	67,14	95,47
Zaduženost	2019.	0,36	0,53	0,59	0,49	0,44
	2018.	0,38	0,55	0,60	0,49	0,42
	2017.	0,38	0,57	0,61	0,52	0,43
Dinamički racio solventnosti	2019.	6,22	12,86	15,53	11,54	1,73
	2018.	4,76	9,53	13,69	9,33	19,13
	2017.	4,16	7,16	9,82	7,05	11,16

Izvor: obrada autora

Analizom dobijenih rezultata moguće je istaći sledeće ocene likvidnosti i solventnosti u tabeli 4.

Prosečne vrednosti koeficijenta perspektivne likvidnosti preduzeća u analiziranim sektorima u Republici Srbiji pokazuju da su daleko od njene poželjne teorijske norme ( $\geq 2$ ), što pokazuje da su ugroženi uslovi za održanje likvidnosti. Prosečna vrednost pokazatelja sektora A, B i C je nešto preko 1, i to neznatno, što je ipak bolje od proseka privrede, čemu su doprinele niže poželjne vrednosti koeficijenta u sektoru A.

Na bazi vrednosti koeficijenta efektivne likvidnosti može se zaključiti da analizirana preduzeća u proseku nemaju dovoljno brzo unovčive imovine za izmirenje kratkoročnih obaveza s obzirom na to da je prosečna vrednost pokazatelja znatno manja od poželjne teorijske vrednosti  $\geq 1$ .

Pokazatelj zaduženosti kao odnos ukupnih obaveza (kratkoročne i dugoročne) i ukupne imovine govori koliko se društvo finansira iz tuđih izvora odnosno iz tuđeg kapitala. Što je pokazatelj veći, preduzeće je zaduženije i veći je rizik investirati u njega. Poželjno je, prema iskustvu u praksi, da pokazatelj zaduženosti ne prelazi vrednost 0,5 iz razloga što bi preduzeće trebalo da preferira finansiranje iz sopstvenih na račun tuđih izvora.

Vrednost pokazatelja zaduženosti u sektorima B i C veća je od 0,5, što znači da se finansira više iz tuđih nego iz sopstvenih izvora. Dakle, oslanjajući se na vrednosti pokazatelja zaduženosti, može se zaključiti da su preduzeća u sektorima B i C dobrano finansijski napregnuta, ali i upoznata sa kratkoročnim i dugoročnim obavezama jer je vrednost pokazatelja približno jednaka u analiziranom periodu. Vrednost pokazatelja zaduženosti u sektoru A je niža od 0,5, što znači da se preferira finansiranje iz sopstvenih, a ne iz tuđih izvora. Izolovano, gledano po pokazatelju zaduženosti, moglo bi se zaključiti da je sektor A bolje strukturiran, zbog relativno manje zaduženosti u odnosu na sektore B i C, ali i na prosečna ostvarenja privrede, ali data situacija zahteva analizu uzroka i okolnosti ovakvih vrednosti, imajući u vidu opštepoznate uslove i poziciju likvidnosti poslovanja u sektoru A.

Na osnovu dosadašnjih analiza, može se zaključiti da su prosečne vrednosti statičkih pokazatelja likvidnosti znatno manje od poželjnih teorijskih vrednosti, te da značajna zaduženost preduzeća u sektorima B i C implicira nepovoljnu ocenu likvidnosti, tj. ugroženu likvidnost i nepovoljne uslove za finansijski stabilno poslovanje preduzeća.

Dalji razvoj analize upotpunjemo nalazima vrednosti dinamičkih pokazatelja likvidnosti i solventnosti, radi celovitijih zaključaka o likvidnosti i finansijskoj poziciji analiziranih preduzeća.

Net profit	31.440.007,00	172.799.451,00	120.369.513,00	324.608.971,00	44,00%	737.717.856,00
Net loss	33.691.567,00	71.265.183,00	42.986.238,00	147.942.988,00	54,25%	272.713.098,00
2017						
Operating income	309.777.042,00	2.913.604.544,00	3.623.853.541,00	6.847.235.127,00	65,77%	10.411.552.581,00
Net profit	18.491.709,00	230.857.892,00	125.354.577,00	374.704.178,00	56,06%	668.429.274,00
Net loss	11.198.430,00	85.490.505,00	49.113.973,00	145.802.908,00	52,30%	278.774.483,00

Source: edited by the author

According to the published data, the companies that submitted annual financial reports for 2019 generated a total of 7,938,481,336.00 dinars of sales revenue, which represents 62.98% of the total turno-

ver, ie 51.24% of the net profit of all active companies. The situation is similar throughout the study period. Therefore, the results obtained can be considered representative for the adoption of conclusions.

**Table 4.** Overview of liquidity and solvency indicators in the Republic of Serbia in the period 2017-2019

Indicator	Period	Sector A	Sector B	Sector C	Average Sectors A, B i C	Average of all sectors
Perspective liquidity (current liquidity ratio)	2019	1,02	1,05	1,13	1,07	0,94
	2018	0,96	0,99	1,12	1,02	0,95
	2017	0,94	0,94	1,07	0,98	0,91
Effective liquidity (rigorous ratio)	2019	0,60	0,64	0,67	0,63	0,10
	2018	0,56	0,60	0,67	0,61	0,76
	2017	0,54	0,57	0,64	0,58	0,73
Cash cycle (in days)	2019	89,42	78,25	45,95	71,21	112,65
	2018	83,03	75,46	43,25	67,25	106,09
	2017	90,60	70,19	40,64	67,14	95,47
Indebtedness	2019	0,36	0,53	0,59	0,49	0,44
	2018	0,38	0,55	0,60	0,49	0,42
	2017	0,38	0,57	0,61	0,52	0,43
Dynamic solvency ratio	2019	6,22	12,86	15,53	11,54	1,73
	2018	4,76	9,53	13,69	9,33	19,13
	2017	4,16	7,16	9,82	7,05	11,16

Source: edited by the author

By analyzing the obtained results, it is possible to point out the following liquidity and solvency assessments in Table 4, as follows:

The average values of the coefficient of perspective liquidity of the companies in the analyzed sectors in the Republic of Serbia show that they are far from its desired theoretical norm ( $\geq 2$ ), which shows that they are affected by the conditions for maintaining liquidity. The average value of the indicators of Sectors A, B and C is slightly over 1, and it is insignificant, which is still better than the average of the economy, with the lower desirable values of the coefficient in Sector A contributing.

Based on the value of the effective liquidity ratio, it can be concluded that the analyzed companies do not have enough assets on average that can be quickly converted into cash to settle short-term liabilities, given that the average value of the indicator is significantly less than the desired theoretical value  $\geq 1$ .

The indebtedness indicator as the ratio of total liabilities (short-term and long-term) and total assets shows how much the company is financed by borrowing, ie using borrowed capital. The higher the indicator, the more indebted the company is and the greater the risk of investing in the company itself. It is desirable, according to experience in practice, that the indebtedness indicator does not exceed the value of 0.5 because the company should prefer using equity over borrowing.

The value of the indebtedness indicators in Sectors B and C is higher than 0.5, which means that it is financed more by borrowing than by using equity. Thus, relying on the value of the indebtedness indicator, it can be concluded that companies in Sectors B and C are well financially strained, but also familiar with short-term and long-term liabilities because the value of the indicator is approximately the same in the analyzed period. The value of the indebtedness indicator in Sector A is lower than 0.5, which means that financing by equity is preferred, and not by taking on more debt. Isolated, according to the indebtedness indicator, it could be concluded that Sector A is better structured, due to relatively less indebtedness in relation to Sectors B and C, but also on average achievements of the economy, but the given situation requires analysis of causes and circumstances of such values considering generally known conditions and the liquidity position of operations in Sector A.

Based on previous analyzes, it can be concluded that the average values of static liquidity indicators are significantly less than the desired theoretical values, and that the significant indebtedness of companies in Sectors B and C implies an unfavorable liquidity assessment, ie. endangered liquidity and unfavorable conditions for financially stable business operations of the company.

Analizom dobijenih rezultata dinamičke likvidnosti i solventnosti moguće je primetiti da je došlo do produženja gotovinskog ciklusa na nivou privrede sa 95 na 112 dana, a slična je tendencija u analiziranim sektorima A, B i C. Analizom strukture elemenata gotovinskih ciklusa može se uočiti da je efekat na produženje novčanog toka imalo smanjenje dana plaćanja obaveza prema dobavljačima. Naravno, period trajanja gotovinskog ciklusa najkraći je u sektoru B, na čije trajanje utiče tipologija delatnosti, a iskustvene norme ukazuju na njegovo kraće trajanje u trgovinskoj delatnosti u odnosu na poljoprivredu i industrijske delatnosti.

Dalje, iskustvene norme u praksi ukazuju na to da je veća vrednost pokazatelja pokrivača troškova kamata (dinamičke solventnosti) bolja, pa se smatra da je vrednost od 3 do 7 solidna, a preko 7 poželjna. Prikazani rezultati pokrivača troškova kamata prikazuju značajne razlike u finansijskoj moći odnosno stepenu generisanja operativne gotovine za plaćanje kamata za kredite. Naime, sektor A ima znatno lošiju finansijsku moć, za razliku od sektora B i C te proseka privrede, pa kako se smatra da viša vrednost pokazatelja znači veće mogućnosti zaduživanja i da ukazuje kreditorima na sigurniju naplatu kamata, to mora biti ključni razlog relativno manjeg stepena zaduženosti sektora A.

Sveukupno posmatrano, moguće je zaključiti da vrednosti odabranih statičkih i dinamičkih pokazatelja nisu na nivou poželjnih iskustvenih odnosno teorijskih vrednosti i da je ugrožena likvidnost i uslovi za njeno održanje. Pored toga, indikativno je značajno učešće tuđih izvora finansiranja zbog posledica po poslovnu i finansijsku samostalnost, koje je kod sektora A relativno manje, što ukazuje na neadekvatnu profitnu odnosno kreditnu poziciju i finansijsku fleksibilnost u sektoru A.

Dakle, polazeći od navedenih zaključaka analize, treba imati u vidu da moderno poslovno upravljanje određuje tzv. „vremenske makaze“, tj. sa jedne strane potrebna je efikasna reakcija na vre-

me, a sa druge strane je zbog rastuće kompleksnosti i dinamike potrebno sve više raspoloživog vremena za reakciju. Iz tog razloga, sa aspekta analize likvidnosti, postoji, sa jedne strane, potreba za što manjim brojem relevantnih pokazatelja, a sa druge strane težnja da se koristi što veći broj pokazatelja, što može da dovede do tzv. „paralize analize“, da bi se odslikalo stanje i perspektive likvidnosti preduzeća.

Stoga se dalji predmet istraživanja fokusira na analizu međuzavisnosti i opravdanosti primene u praksi najtipičnijih pokazatelja statičke i dinamičke likvidnosti kao integralne osnove za relevantnu ocenu likvidnosti preduzeća.

Da bismo pristupili analizi i ispitali da li između posmatranih varijabli postoji međuzavisnost u okviru sektora A – Poljoprivreda, šumarstvo i ribarstvo u periodu 2017–2019. i, ukoliko postoji, koliko je ta veza jaka, primenjena je korelaciona analiza. Korelacionom analizom dalje je utvrđeno koji je smer veze između pet varijabli, a na osnovu numeričke vrednosti izveden je zaključak koliko je ta veza jaka. Pirsonov koeficijent korelacije, dat u tabeli 5, između pet posmatranih varijabli u okviru sektora A – Poljoprivreda, šumarstvo i ribarstvo u periodu 2017–2019. statistički je signifikantan na nivou 0,05 i pokazuje povezanost između perspektivne likvidnosti (tekući racio likvidnosti) i dinamičkog racija solventnosti (dinamički pokazatelj) ( $p = ,028$ ). Znak Pirsonovog koeficijenta korelacije je pozitivan, veza između posmatranih varijabli je veoma jaka (0,999). Možemo zaključiti da je rezultat korelacione analize statistički signifikantan, pri čemu je prisutna pozitivna linearna korelacija. Druga značajna korelacija utvrđena je između efektivne likvidnosti (rigorozni racio) i dinamičkog racija solventnosti (dinamički pokazatelj) ( $p = ,030$ ). Znak Pirsonovog koeficijenta korelacije je pozitivan, veza između posmatranih varijabli je veoma jaka (0,999). Možemo zaključiti da je rezultat korelacione analize statistički signifikantan, pri čemu je prisutna pozitivna linearna korelacija.

**Tabela 5.** Analiza međuzavisnosti izabranih pokazatelja likvidnosti preduzeća u okviru sektora Poljoprivreda, šumarstvo i ribarstvo (sektor A)

		Correlations				
		POLJL	POLJEL	POLJG	POLJZAD	POLJS
POLJL	Pearson Correlation	1	,996	,135	-,971	,999*
	Sig. (2-tailed)		,058	,914	,154	,028
	N	3	3	3	3	3
POLJEL	Pearson Correlation	,996	1	,045	-,945	,999*
	Sig. (2-tailed)	,058		,972	,212	,030
	N	3	3	3	3	3
POLJG	Pearson Correlation	,135	,045	1	-,369	,091
	Sig. (2-tailed)	,914	,972		,759	,942
	N	3	3	3	3	3
POLJZAD	Pearson Correlation	-,971	-,945	-,369	1	-,959
	Sig. (2-tailed)	,154	,212	,759		,183
	N	3	3	3	3	3
POLJS	Pearson Correlation	,999*	,999*	,091	-,959	1
	Sig. (2-tailed)	,028	,030	,942	,183	
	N	3	3	3	3	3

\*. Correlation is significant at the 0.05 level (2-tailed).

Further development of the analysis is complemented by the findings of the values of dynamic indicators of liquidity and solvency, in order to more comprehensive conclusions about the liquidity and financial position of the analyzed companies. By analyzing the obtained results of dynamic liquidity and solvency, it is possible to notice that the cash cycle at the level of the economy was extended from 95 to 112 days, and a similar tendency in the analyzed Sectors A, B and C. By analyzing the structure of the elements of cash cycles, it can be seen that the reduction in the number of days of payment of liabilities to suppliers had an effect on the extension of cash flow. Of course, the duration of the cash cycle is the shortest in Sector B, the duration of which is influenced by the typology of activities, and experiential norms indicate that its duration is shorter in trade than in agriculture and industrial activities.

Furthermore, empirical norms in practice indicate that a higher value of the indicator of interest cost coverage (dynamic solvency) is better, so it is considered that a value of 3-7 is solid, and over 7 is desirable. Presented, the results of interest cost coverage show significant differences in financial power or the degree of generation of operating cash to pay interest on loans. Namely, Sector A has significantly poorer financial power, unlike Sectors B and C and the average of the economy, so it is considered that a higher value of the indicator means greater borrowing opportunities and indicates to creditors a more secure collection of interest, and this must be the key reason for the relatively lower level of indebtedness of Sector A.

Overall, it is possible to conclude that the values of selected static and dynamic indicators are not at the level of desirable experiential or theoretical values and that the liquidity and conditions for its maintenance are endangered. In addition, the significant share of borrowing is indicative due to the consequences for business and financial independence, which is relatively lower in Sector A, which indicates an inadequate profit or credit position and financial flexibility in Sector A.

Therefore, starting from the above conclusions of the analysis, it should be borne in mind that modern business management deter-

mines the so-called “time scissors”, ie, on the one hand requires an efficient response to time, and on the other hand due to growing complexity and dynamics for reaction. For this reason, from the aspect of liquidity analysis, on the one hand there is a need for as few relevant indicators as possible, and on the other hand there is a tendency to use as many indicators as possible, which can lead to the so-called “analysis paralysis”, to reflect the state and prospects of the company’s liquidity.

Therefore, the further subject of the research focuses on the analysis of interdependence and justification of application in practice of the most typical indicators of static and dynamic liquidity as an integral basis for a relevant assessment of company liquidity.

Therefore, in order to approach the analysis and examine whether there is interdependence between the observed variables within Sector A Agriculture, Forestry and Fisheries for companies in the period 2017-2019 and, if so, how strong this relationship is, correlation analysis was applied. Correlation analysis further determined the direction of the relationship between the five variables, and based on the numerical value, a conclusion was drawn as to how strong this relationship is. Pearson’s correlation coefficient, given in Table 5, between the five observed variables within Sector A Agriculture, Forestry and Fisheries for companies in the period (2017-2019) is statistically significant at the level of 0.05 and shows the correlation between Perspective liquidity (liquidity) and the Dynamic Solvency Ratio (dynamic indicator) ( $p = .028$ ). The sign of Pearson’s correlation coefficient is positive, the relationship between the observed variables is very strong (0.999). We can conclude that the result of the correlation analysis is statistically significant with a positive linear correlation. Another significant correlation was found between Effective liquidity (rigorous ratio) and Dynamic solvency ratio (dynamic indicator) ( $p = .030$ ). The sign of Pearson’s correlation coefficient is positive, the relationship between the observed variables is very strong (0.999). We can conclude that the result of the correlation analysis is statistically significant with a positive linear correlation.

**Table 5.** Analysis of the interdependence of selected liquidity indicators of companies within the sector Agriculture, Forestry and Fisheries (Sector A)

		Correlations				
		POLJL	POLJEL	POLJG	POLJZAD	POLJS
POLJL	Pearson Correlation	1	,996	,135	-,971	,999*
	Sig. (2-tailed)		,058	,914	,154	,028
	N	3	3	3	3	3
POLJEL	Pearson Correlation	,996	1	,045	-,945	,999*
	Sig. (2-tailed)	,058		,972	,212	,030
	N	3	3	3	3	3
POLJG	Pearson Correlation	,135	,045	1	-,369	,091
	Sig. (2-tailed)	,914	,972		,759	,942
	N	3	3	3	3	3
POLJZAD	Pearson Correlation	-,971	-,945	-,369	1	-,959
	Sig. (2-tailed)	,154	,212	,759		,183
	N	3	3	3	3	3
POLJS	Pearson Correlation	,999*	,999*	,091	-,959	1
	Sig. (2-tailed)	,028	,030	,942	,183	
	N	3	3	3	3	3

\*. Correlation is significant at the 0.05 level (2-tailed).

Source: edited by the author



Legenda: POLJL: Poljoprivreda, šumarstvo i ribarstvo – perspektivna likvidnost (tekući racio likvidnosti)

POLJEL: Poljoprivreda, šumarstvo i ribarstvo – efektivna likvidnost (rigorozni racio)

POLJG: Poljoprivreda, šumarstvo i ribarstvo – gotovinski ciklus

POLJZAD: Poljoprivreda, šumarstvo i ribarstvo – zaduženost

POLJS: Poljoprivreda, šumarstvo i ribarstvo – dinamički racio solventnosti

Potom je urađena korelaciona analiza posmatranih varijabli u okviru sektora B – Prerađivačka industrija u periodu 2017–2019. da bi se utvrdilo da li postoji međuzavisnost i, ukoliko postoji, koliko je ta veza jaka. Korelacionim analizom dalje je utvrđeno koji je smer veze između pet varijabli, a na osnovu numeričke vrednosti izveden je zaključak koliko je ta veza jaka. Pirsonov koeficijent korelacije, dat u tabeli 6, između pet posmatranih varijabli u okviru sektora B – Prerađivačka industrija u periodu 2017–2019. statistički je signifikantan na nivou 0,05 i pokazuje povezanost između perspektivne likvidnosti (tekući racio likvidnosti) i efektivne likvidnosti (rigorozni racio) ( $p = ,019$ ). Znak Pirsonovog koeficijenta korelacije je pozitivan, veza između posmatranih varijabli je veoma jaka (1,000). Možemo zaključiti da je rezultat korelacione analize statistički signifikantan, pri čemu je prisutna pozitivna linearna korelacija. Druga značajna korelacija utvrđena je između perspektivne likvidnosti (tekući racio likvidnosti) i zaduženosti ( $p$

$= ,033$ ). Znak Pirsonovog koeficijenta korelacije je negativan, veza između posmatranih varijabli je veoma jaka (-0,999). Možemo zaključiti da je rezultat korelacione analize statistički signifikantan, pri čemu je prisutna negativna linearna korelacija. Treća značajna korelacija utvrđena je između perspektivne likvidnosti (tekući racio likvidnosti) i dinamičkog racija solventnosti (dinamički pokazatelj) ( $p = ,028$ ). Znak Pirsonovog koeficijenta korelacije je pozitivan, veza između posmatranih varijabli je veoma jaka (0,999). Možemo zaključiti da je rezultat korelacione analize statistički signifikantan, pri čemu je prisutna pozitivna linearna korelacija. Četvrta značajna korelacija utvrđena je između efektivne likvidnosti (rigorozni racio) i dinamičkog racija solventnosti (dinamički pokazatelj) ( $p = ,009$ ). Znak Pirsonovog koeficijenta korelacije je pozitivan, veza između posmatranih varijabli je veoma jaka (1,000). Možemo zaključiti da je rezultat korelacione analize statistički signifikantan, pri čemu je prisutna pozitivna linearna korelacija.

**Tabela 6.** Analiza međuzavisnosti izabranih pokazatelja likvidnosti preduzeća u okviru sektora Prerađivačka industrija (sektor B)

		Correlations				
		PREL	PREREL	PRERG	PRERZAD	PRERS1
PREL	Pearson Correlation	1	1,000*	,974	-,999*	,999*
	Sig. (2-tailed)		,019	,145	,033	,028
	N	3	3	3	3	3
PREREL	Pearson Correlation	1,000*	1	,967	-,997	1,000**
	Sig. (2-tailed)	,019		,164	,052	,009
	N	3	3	3	3	3
PRERG	Pearson Correlation	,974	,967	1	-,985	,963
	Sig. (2-tailed)	,145	,164		,112	,174
	N	3	3	3	3	3
PRERZAD	Pearson Correlation	-,999*	-,997	-,985	1	-,995
	Sig. (2-tailed)	,033	,052	,112		,062
	N	3	3	3	3	3
PRERS	Pearson Correlation	,999*	1,000**	,963	-,995	1
	Sig. (2-tailed)	,028	,009	,174	,062	
	N	3	3	3	3	3
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

Izvor: obrada autora

Legenda: PRERL: Prerađivačka industrija – perspektivna likvidnost (tekući racio likvidnosti)

PREREL: Prerađivačka industrija – efektivna likvidnost (rigorozni racio)

PRERG: Prerađivačka industrija – gotovinski ciklus

PRERZAD: Prerađivačka industrija – zaduženost

PRERS: Prerađivačka industrija – dinamički racio solventnosti

Da bismo dalje ispitali da li između posmatranih varijabli u okviru sektora C – Trgovina na veliko i trgovina na malo; popravka motornih vozila i motocikala u periodu 2017–2019. postoji međuzavisnost

i, ukoliko postoji, koliko je ta veza jaka, primenjena je korelaciona analiza. Korelacionim analizom dalje je utvrđeno koji je smer veze između pet varijabli, a na osnovu numeričke vrednosti izveden je



- Legend: POLJL: Agriculture, Forestry and Fisheries - Perspective liquidity (current liquidity ratio)
- POLJEL: Agriculture, Forestry and Fisheries - Effective liquidity (rigorous ratio)
- POLJG: Agriculture, Forestry and Fisheries - Cash cycle
- POLJZAD: Agriculture, Forestry and Fisheries - Indebtedness
- POLJS: Agriculture, Forestry and Fisheries - Dynamic solvency ratio

Then, a correlation analysis of the observed variables within Sector B Manufacturing in the period 2017-2019 was performed to determine whether there is interdependence and, if so, how strong this relationship is. Correlation analysis determined the direction of the relationship between the five variables, and based on the numerical value, a conclusion was made as to how strong this connection is. Pearson's correlation coefficient, given in Table 6, between the five observed variables within Sector B Manufacturing in the period 2017-2019 is statistically significant at the level of 0.05 and shows the relationship between Perspective liquidity (current liquidity ratio) and Effective liquidity (rigorous ratio) ( $p = .109$ ). The sign of Pearson's correlation coefficient is positive, the relationship between the observed variables is very strong (1,000). We can conclude that the result of the correlation analysis is statistically significant with a positive linear correlation. Another significant correlation was found between Perspective liquidity (current liquidity ratio) and Indebtedness

( $p = .033$ ). The sign of Pearson's correlation coefficient is negative, the relationship between the observed variables is very strong (-0.999). We can conclude that the result of the correlation analysis is statistically significant with a negative linear correlation. The third significant correlation was found between Perspective liquidity (current liquidity ratio) and Dynamic solvency ratio (dynamic indicator) ( $p = .028$ ). The sign of Pearson's correlation coefficient is positive, the relationship between the observed variables is very strong (0.999). We can conclude that the result of the correlation analysis is statistically significant with a positive linear correlation. A fourth significant correlation was found between Effective Liquidity (rigorous ratio) and Dynamic Solvency Ratio (dynamic indicator) ( $p = .009$ ). The sign of Pearson's correlation coefficient is positive, the relationship between the observed variables is very strong (1,000). We can conclude that the result of the correlation analysis is statistically significant with a positive linear correlation.

**Table 6.** Analysis of the interdependence of selected liquidity indicators of companies within the Manufacturing sector (Sector B)

Correlations						
	PREL	PREREL	PRERG	PRERZAD	PRERS1	
PREL	Pearson Correlation	1	1,000*	,974	-,999*	,999*
	Sig. (2-tailed)		,019	,145	,033	,028
	N	3	3	3	3	3
PREREL	Pearson Correlation	1,000*	1	,967	-,997	1,000**
	Sig. (2-tailed)	,019		,164	,052	,009
	N	3	3	3	3	3
PRERG	Pearson Correlation	,974	,967	1	-,985	,963
	Sig. (2-tailed)	,145	,164		,112	,174
	N	3	3	3	3	3
PRERZAD	Pearson Correlation	-,999*	-,997	-,985	1	-,995
	Sig. (2-tailed)	,033	,052	,112		,062
	N	3	3	3	3	3
PRERS	Pearson Correlation	,999*	1,000**	,963	-,995	1
	Sig. (2-tailed)	,028	,009	,174	,062	
	N	3	3	3	3	3

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: edited by the author

- Legend: PRERL: Manufacturing - Perspective liquidity (current liquidity ratio)
- PREREL: Manufacturing - Effective liquidity (rigorous ratio)
- PRERG: Manufacturing - Cash cycle
- PRERZAD: Manufacturing - Indebtedness
- PRERS: Manufacturing - Dynamic solvency ratio

To further examine whether between the observed variables within Sector C Wholesale and Retail; repair of motor vehicles and motorcycles in the period 2017-2019 there is interdependence and, if

any, how strong this relationship is, correlation analysis was applied. Correlation analysis further determined the direction of the relationship between the five variables, and based on the numerical

zaključak koliko je ta veza jaka. Pirsonov koeficijent korelacije, dat u tabeli 7, između pet posmatranih varijabli u okviru sektora C – Trgovina na veliko i trgovina na malo; popravka motornih vozila i motocikala u periodu 2017–2019. statistički je signifikantan na nivou 0,05 i pokazuje povezanost između gotovinskog ciklusa i

zaduženosti ( $p = ,006$ ). Znak Pirsonovog koeficijenta korelacije je negativan, veza između posmatranih varijabli je veoma jaka ( $-1,000$ ). Možemo zaključiti da je rezultat korelacione analize statistički signifikantan, pri čemu je prisutna negativna linearna korelacija.

**Tabela 7.** Analiza međuzavisnosti izabranih pokazatelja likvidnosti preduzeća u okviru sektora Trgovina na veliko i trgovina na malo; popravka motornih vozila i motocikala (sektor C)

		Correlations				
		TRGL	TRGEL	TRGG	TRGZAD	TRGS
TRGL	Pearson Correlation	1	,988	,930	-,933	,986
	Sig. (2-tailed)		,099	,239	,234	,105
	N	3	3	3	3	3
TRGEL	Pearson Correlation	,988	1	,862	-,866	,949
	Sig. (2-tailed)	,099		,339	,333	,204
	N	3	3	3	3	3
TRGG	Pearson Correlation	,930	,862	1	-1,000**	,978
	Sig. (2-tailed)	,239	,339		,006	,134
	N	3	3	3	3	3
TRGZAD	Pearson Correlation	-,933	-,866	-1,000**	1	-,980
	Sig. (2-tailed)	,234	,333	,006		,129
	N	3	3	3	3	3
TRGS	Pearson Correlation	,986	,949	,978	-,980	1
	Sig. (2-tailed)	,105	,204	,134	,129	
	N	3	3	3	3	3

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Izvor: obrada autora

Legenda: TRGL: Trgovina na veliko i trgovina na malo; popravka motornih vozila i motocikala – perspektivna likvidnost (tekući ratio likvidnosti)

TRGEL: Trgovina na veliko i trgovina na malo; popravka motornih vozila i motocikala – efektivna likvidnost (rigorozni ratio)

TRGG: Trgovina na veliko i trgovina na malo; popravka motornih vozila i motocikala – gotovinski ciklus

TRGZAD: Trgovina na veliko i trgovina na malo; popravka motornih vozila i motocikala – zaduženost

TRGS: Trgovina na veliko i trgovina na malo; popravka motornih vozila i motocikala – dinamički ratio solventnosti

Prema dobijenim rezultatima analize korelacije, moguće je zaključiti da dominira jaka pozitivna statistički značajna korelacija između pojedinih pokazatelja likvidnosti odnosno visok stepen njihove međuzavisnosti, a na primeru analiziranih sektora. Izuzetak je smer korelacije, pa je kod sektora B prisutna jaka negativna linearna korelacija između pokazatelja perspektivne likvidnosti i zaduženosti, tj. porastom pokazatelja perspektivne likvidnosti smanjuje se zaduženost i obrnuto. U sektoru C je prisutna jaka negativna linearna korelacija između gotovinskog ciklusa i zaduženosti, tj. porastom pokazatelja gotovinskog ciklusa smanjuje se zaduženost i obrnuto.

Shodno navedenom, možemo zaključiti da dobijeni rezultati opravdavaju postupak analize višedimenzionalnim pokazateljima kako bi se kroz razvijanje integralne analize dobila relevantnija kritička ocena likvidnosti preduzeća. Drugim rečima, možemo istaći da su rezultati korelacione analize statistički signifikantni, tako da imamo argumenata da zaključimo da su empirijska istraživanja afirmisala našu polaznu hipotezu.

## ZAKLJUČAK

Likvidnost je ključna operativna upravljačka veličina koja je od presudnog značaja za društvo i privredu. Upravljanje likvidnošću

zahteva unapred usmerenu orijentaciju ka ciljnim vrednostima, a pritom se kao oslonac koriste postavke za analizu likvidnosti. Rezultati sprovedene analize opravdavaju potrebu primene analize statičkim i dinamičkim pokazateljima i instrumentima kako bi se dobio celovit i relevantan zaključak o likvidnosti poslovanja preduzeća.

U radu je provedena analiza likvidnosti u odabranim delatnostima Republike Srbije za trogodišnji period (2017–2019), koja pokazuje da vrednosti odabranih pokazatelja nisu na nivou poželjnih iskustvenih odnosno teorijskih vrednosti. Shodno tome, možemo zaključiti, vodeći se rezultatima analize odabranih statičkih i dinamičkih pokazatelja, da je ugrožena likvidnost, kao i uslovi za njeno održanje. Pored ostalog, sa jedne strane je ograničena poslovna i finansijska samostalnost, zbog značajnog učešća tuđih izvora finansiranja u sektorima B i C, a sa druge strane, kod sektora A je izražen nedovoljan kreditni kapacitet i finansijska fleksibilnost preduzeća. Strategija upravljanja likvidnošću treba da se usmeri na skraćivanje gotovinskog ciklusa kroz prolongiranje isplate obaveza prema dobavljačima, sa jedne strane, a sa druge strane ubrzanje naplate potraživanja od kupaca i efikasnije upravljanje zalihama, radi poboljšanja finansijske samostalnosti, odnosno u sektoru A poboljšanje finansijske fleksibilnosti predstavlja poseban izazov.

Dobijeni rezultati opravdavaju postupak analize višedimenzionalnim pokazateljima likvidnosti kako bi se razvijanjem analize mogla dati

value, a conclusion was drawn as to how strong this relationship is. Pearson's correlation coefficient, given in Table 7, between the five observed variables within Sector C Wholesale and Retail; repair of motor vehicles and motorcycles in the period (2017-2019) is statistically significant at the level of 0.05 and shows the relationship

between the Cash Cycle and Indebtedness ( $p = .006$ ). The sign of Pearson's correlation coefficient is negative, the relationship between the observed variables is very strong (-1,000). We can conclude that the result of the correlation analysis is statistically significant with a negative linear correlation.

**Table 7.** Analysis of the interdependence of selected liquidity indicators of companies within the sector Wholesale and retail trade; repair of motor vehicles and motorcycles (Sector C)

Correlations						
		TRGL	TRGEL	TRGG	TRGZAD	TRGS
TRGL	Pearson Correlation	1	,988	,930	-,933	,986
	Sig. (2-tailed)		,099	,239	,234	,105
	N	3	3	3	3	3
TRGEL	Pearson Correlation	,988	1	,862	-,866	,949
	Sig. (2-tailed)	,099		,339	,333	,204
	N	3	3	3	3	3
TRGG	Pearson Correlation	,930	,862	1	-1,000**	,978
	Sig. (2-tailed)	,239	,339		,006	,134
	N	3	3	3	3	3
TRGZAD	Pearson Correlation	-,933	-,866	-1,000**	1	-,980
	Sig. (2-tailed)	,234	,333	,006		,129
	N	3	3	3	3	3
TRGS	Pearson Correlation	,986	,949	,978	-,980	1
	Sig. (2-tailed)	,105	,204	,134	,129	
	N	3	3	3	3	3

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: edited by the author

Legend: TRGL: Wholesale and retail trade; repair of motor vehicles and motorcycles - Perspective liquidity (current liquidity ratio)

TRGEL: Wholesale and retail trade; repair of motor vehicles and motorcycles - Effective liquidity (rigorous ratio)

TRGG: Wholesale and retail trade; repair of motor vehicles and motorcycles - Cash cycle

TRGZAD: Wholesale and retail trade; repair of motor vehicles and motorcycles - Indebtedness

TRGS: Wholesale and retail trade; repair of motor vehicles and motorcycles - Dynamic solvency ratio

According to the obtained results of the correlation analysis, it is possible to conclude that a strong positive statistically significant correlation between individual liquidity indicators, ie a high degree of their interdependence, dominates, on the example of the analyzed Sectors. The exception is the direction of correlation, so in Sector B there is a strong negative linear correlation between the indicators of Perspective Liquidity and Indebtedness, ie. with the increase of the Perspective Liquidity indicator, indebtedness decreases and vice versa. And in Sector C, there is a strong negative linear correlation between the cash cycle and indebtedness, ie. an increase in the cash cycle indicator reduces indebtedness and vice versa.

Accordingly, we can conclude that the obtained results justify the analysis procedure with multidimensional indicators in order to obtain a more relevant critical assessment of the company's liquidity through the development of integrated analysis. In other words, we can point out that the results of the correlation analysis are statistically significant, so we have arguments to conclude that empirical research has affirmed our initial hypothesis.

## CONCLUSION

Liquidity is a key operational management variable that is crucial for society and the economy. Liquidity management requires a

forward-looking orientation towards target values, using liquidity analysis settings as a basis. The results of the conducted analysis justify the need to apply the analysis with static and dynamic indicators and instruments in order to obtain a complete and relevant conclusion on the liquidity of the company's operations.

The paper conducts an analysis of liquidity in selected activities of the Republic of Serbia for the three-year period 2017-2019, which shows that the values of selected indicators are not at the level of desirable experiential or theoretical values. Accordingly, we can conclude, based on the results of the analysis of selected static and dynamic indicators, that liquidity is endangered, as well as the conditions for its maintenance. Among other things, on the one hand, business and financial independence is limited, due to the significant participation of other sources of financing in Sectors B and C, and on the other hand, Sector A has insufficient credit capacity and financial flexibility of companies. The liquidity management strategy should be aimed at shortening the cash cycle by prolonging the payment of trade payables, on the one hand, and on the other hand speeding up the collection of trade receivables and more efficient inventory management, in order to improve financial independence, ie in Sector A, improving financial flexibility is a special challenge.

The obtained results justify the analysis procedure with multidimensional liquidity indicators in order to develop a relevant critical

relevantna kritička ocena likvidnosti preduzeća. Možemo zaključiti da su rezultati korelacione analize statistički signifikantni, tako da imamo argumenata da zaključimo da su empirijska istraživanja afirmisala našu polaznu hipotezu.

Dalji tok istraživanja treba usmeriti na dublje istraživanje pozicije likvidnosti putem regresionih modela koji bi pokazali uticaj pokazatelja likvidnosti na profitnu poziciju odnosno rentabilnost preduzeća. Treba imati u vidu da istraživanje obuhvata sve tipove preduzeća, bez obzira na veličinu, a veličina preduzeća je, uz delatnost preduzeća, važna determinanta standarda i nalaza analize likvidnosti preduzeća. Iako mikro i mala preduzeća čine preko 90% u broju, srednja i velika preduzeća uverljivo ostvaruju najveći udeo u ukupno ostvarenim prihodima, što znači da njihovo poslovanje ima najznačajniji uticaj na privredu. Pored toga, njihovo poslovno izveštavanje je u značajnijoj meri pouzdanije, što utiče na adekvatnost nalaza analize na bazi bilansnih podataka. Stoga bi dalji pravac istraživanja trebalo usmeriti i na detaljniju analizu preduzeća po veličini i delatnostima kako bi se još meritornije i serioznije vrednovali dobijeni rezultati istraživanja.

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assessment of the company's liquidity. We can conclude that the results of the correlation analysis are statistically significant, so we have arguments to conclude that empirical research has affirmed our initial hypothesis.

The further course of research should be directed to a deeper research of the liquidity position through regression models that would show the impact of liquidity indicators on the profit position or profitability of the company. It should be borne in mind that the survey covers all types of companies, regardless of size, and the size of the company, in addition to the activity of the company, is an important determinant of standards and findings of liquidity analysis of the company. Although micro and small companies make up over 90% of the number, medium and large companies convincingly achieve the largest share in total revenues, which means that their business has the most significant impact on the economy. In addition, their business reporting is significantly more reliable, which consequently affects the adequacy of the findings of the analysis based on balance sheet data. Therefore, the further direction of the research should be focused on a more detailed analysis of the company by size and activities in order to evaluate the obtained research results even more meritoriously and seriously.

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ORIGINALNI NAUČNI RAD

# Obrazovni sistem i nova normalnost u učenju

## Education system and the new normal in learning

### Rezime

Posljednjih godina na globalnom nivou značajna sredstva su uložena u digitalne učionice, uvođenje e-nastave i inovativne digitalne alate za učenje. Iako je to bio cilj većine škola i način da se unaprijedi kvalitet školskog sistema, kriza pandemije COVID-19 pokazala je drugačije stanje u školama. U praksi ovaj cilj nije postignut na zadovoljavajućem nivou, a škole još uvijek nisu spremne za potpuni prelazak na onlajn nastavu. U isto vrijeme, pred postojeći školski sistem postavlja se zahtjev reforme obrazovnog sistema – onog koji će osnažiti sve učenike da istražuju svoju prirodnu kreativnost, otkriju svoje prave vještine i oblikuju svoju budućnost, a uz pomoć primjene digitalnih instrumenata. Globalno obrazovanje kakvo je danas bori se sa zastarjelim nastavnim programom, s visokim troškovima i fizičkim prisustvom u učionicama. Poznati savremeni kurikulum zasnovan na kompetencijama treba da bude osnovno jezgro integrisano sa najboljim praksama iz cijelog svijeta, kako bi omogućio personalizovani, multidisciplinarni i svrsishodan obrazovni sistem. Fokus treba da bude na učenju sa zadovoljstvom, školi koja promovise dobrobit, izgradnju karaktera i njeguje cjeloživotno učenje. Kriza pandemije COVID-19 primorala je mnoge škole i univerzitete da se odmah prebace na onlajn predavanja. Mnogim nastavnicima bilo je teško da u tako kratkom vremenu obezbijede efikasna predavanja putem interneta i ostalih dostupnih medija. Time su škole širom svijeta bile primorane da obezbijede efikasna rješenja za izvođenje nastave u novonastaloj situaciji. U primjenjivim digitalnim rješenjima, predmeti zasnovani na znanju mogu se lako predavati onlajn, a sticanje vještina i kompetencija slično kao i u tradicionalnim učionicama. Sistem treba da se kroz personalizovano učenje fokusira na vještine koje će studentima biti potrebne za što lakše zaposlenje i tržište rada. Glavni cilj je pružanje unaprijeđenog, visokokvalitetnog i pristupačnog obrazovanja za sve. Pandemija COVID-19 ne treba da bude samo prepreka dostupnosti kvalitetnog obrazovanja, već i otvorena mogućnost za novi način učenja.

**Ključne riječi:** obrazovni sistem, kriza COVID-19, e-učenje, ishodi učenja.

### Abstract

In recent years, significant resources have been invested globally in digital classrooms, the introduction of e-learning and innovative digital learning tools. Although this was the final goal of most schools and way to improve current school system, the crisis has shown different facts. In practice this has not been achieved at a satisfactory level and schools are not yet ready for this type of teaching. At the same time a request is made for the new educational system – it should empower all students to explore their natural creativity, discover their true passions, and shape their future through digital instruments. Global education as it stands today is struggling with outdated, high cost and location-bound education. The renowned competency-based, modern curriculum as basic core integrated with best practices from around the world should create a personalized, multidisciplinary, and purposeful educational system. This places a strong focus on learning with joy, a school that promotes well-being, character building and fosters lifelong learning. The COVID-19 outbreak has compelled many schools and universities to immediately switch to the online delivery of lessons. It was difficult for many teachers to develop effective online lessons in such a short period of time. The COVID-19 crisis forced schools worldwide to wake-up to the lack of working solutions to new delivery of education. In a new education solution, knowledge-based subjects can easily be taught online and skills and competencies in traditional classrooms. The system focuses through personalized learning on skills that the students will need in the worklife instead of making student memorize knowledge. The main goal is to delivery of future-ready, high-quality and affordable education for everyone. The COVID-19 crisis should allow us to use the window of opportunity opened and not only being the obstacles to new knowledge.

**Keywords:** Education system, COVID-19 crisis, e-learning, learning outcomes.

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## UVOD

Posljednje godine, pa i decenije, bile su izazov i presudna raskrsnica u obrazovnom sektoru. Pokazalo se da je od suštinske važnosti poboljšati trenutni globalni obrazovni sistem, ali i inovirati ga u cilju obezbjeđenja kvalitetnog obrazovanja za buduće generacije. Kriza COVID-19 primorala je škole širom svijeta da shvate koji su nedostaci za izvođenje kvalitetne nastave u vrijeme kada se klasičnom učenju i školama u fizičkom smislu ne može pristupiti. Čak i prije pandemije COVID-19, Svjetska banka je u izveštaju iz 2018. godine identifikovala uzroke krize učenja.

Danas se svijet suočava sa globalnom krizom učenja u školama. Globalni obrazovni sistem kakav je danas, nalazi se u borbi sa zastarjelim načinom držanja nastave, visokim troškovima i neophodnim fizičkim prisustvom. Škole širom svijeta i dalje se usredsređuju na nastavno znanje koje učenici pamte, umjesto na savladavanje vještina koje su učenicima potrebne prilikom ulaska na tržište rada. Ono što nam danas treba jeste obrazovni sistem koji će se zasnivati na kompetencijama sa savremenim kurikulumom i koji će se primjenjivati i uz pomoć inovativnih digitalnih instrumenata.

COVID-19 primorao je vlade da ubrzano uvedu ili prošire programe učenja na daljinu, a pitanje koje se postavlja jeste da li su preduslovi stvoreni za takvu brzu primjenu kvalitetno uspostavljeni širom svijeta. Obrazovanje i obuka polako ali sigurno digitalizuju onlajn sadržaje, časove, ispite i udžbenike. Polje obrazovanja i obuke takođe se mijenja u pogledu organizacije i pedagogije. Sve više su potrebni različiti alati za e-učenje, jednostavni za upotrebu, i novo rješenje za korišćenje ovih mogućnosti koje nudi kontekstualno učenje za sve, bez obzira na lokaciju.

Nova normalnost u učenju treba da obuhvati prilagođene digitalne resurse i platforme za učenje, da svakom učeniku omogući personalizovano učenje (učenje vlastitim tempom i interesovanjem), da pokaže napredak, postignuća i kompetencije iz svih aktivnosti i učenja u školi i izvan nje, i da poboljša samosvijest učenika i razumijevanje njihovog puta dostignuća.

Obrazovanje je dugo bilo presudno za dobrobit ljudi, ali još je važnije u vremenu brzih ekonomskih i socijalnih promjena. Prije nego

što je COVID-19 zatvorio škole, svijet je već bio usred globalne krize učenja koja je ugrozila napore zemalja da izgrade ljudski kapital – vještine i znanja potrebne za buduće poslove. Podaci Svjetske banke i UNESCO-a pokazali su da 53% djece na kraju osnovnog obrazovanja u zemljama sa niskim i srednjim prihodima ima loše uslove i, posljedično, ishode učenja (Svjetska banka, 2019).

## 1. PREGLED LITERATURE

### 1.1. Karakteristike globalnog obrazovnog sistema

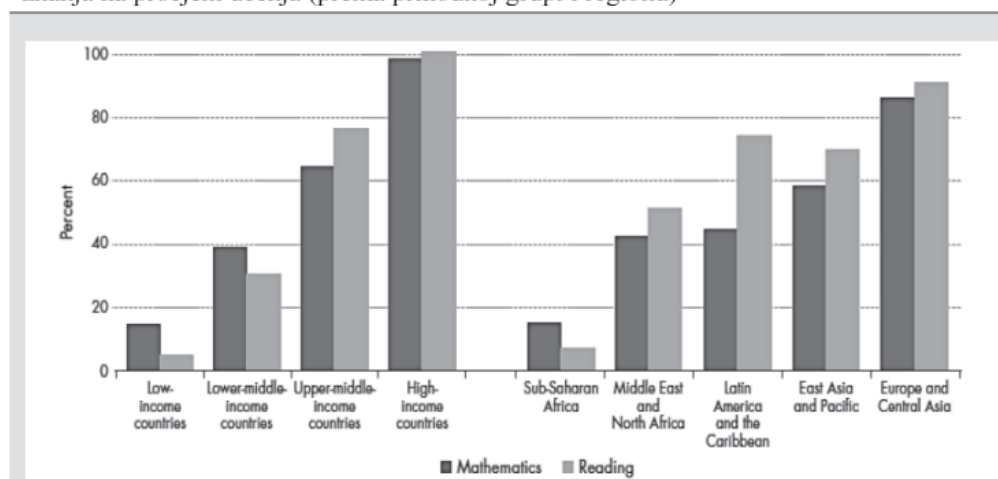
U izvještaju Svjetske banke za 2018. godinu identifikovani su uzroci krize učenja u školama, i to u tri osnovne dimenzije. U nastavku teksta ih izlažemo i analiziramo.

- 1) Loši ishodi učenja: nizak nivo znanja, velika nejednakost i spor napredak

Učenje koje bi trebalo očekivati u školama na osnovu formalnih programa ili izraženih potreba poslodavaca često se ne susreće u praksi. Još veća zabrinutost je što mnoge zemlje ne uspijevaju da obezbijede ni osnovno učenje za sve učenike. Pojedinci koji su već u nepovoljnom položaju u društvu zbog siromaštva, lokacije, nacionalnosti, pola ili invaliditeta, prema istraživanjima, imaju najmanje uslova za redovno učenje. Stoga obrazovni sistemi mogu proširiti socijalne praznine umjesto da ih sužavaju. U mnogim zemljama u razvoju tokom posljednjih nekoliko decenija, upis u obrazovanje nadmašio je istorijske pokazatelje današnjih najrazvijenijih zemalja. Na primjer, Sjedinjenim Državama je trebalo 40 godina – od 1870. do 1910. godine – da povećaju upis djevojčica sa 57 na 88 procenata. Broj godina školovanja koje je prosječna odrasla osoba završila u zemljama u razvoju više se nego utrostručio od 1950. do 2010. godine, sa 2,0 na 7,2 godine. Ovaj napredak znači da se većina praznina u upisu u osnovne škole smanjuje između zemalja sa visokim i niskim prihodima. Do 2008. godine prosječna zemlja sa niskim prihodima upisivala je učenike u osnovnu školu po skoro istoj stopi kao i prosječna zemlja sa visokim prihodima (Azevedo et al., 2020).

**Slika 1.** Procenat učenika osnovnih škola koji pređu minimalni prag znanja

Prosječni učenici u kasnoj osnovnoj školi koji su postigli ocjenu iznad minimalnog nivoa znanja na procjeni učenja (prema prihodnoj grupi i regionu)



Izvor: Izvještaj Svjetske banke za 2018. Dostupno na: <https://www.worldbank.org/en/publication/wdr2018>

### 2) Škole podbacuju učenike u očekivanjima

Trenutnim obrazovnim sistemima nedostaje jedan ili više od četiri ključna faktora za ostvarivanje boljih ishoda učenja. Prvo, djeca

često dolaze u školu nespremna za učenje. U isto vrijeme, nastavnicima često nedostaju vještine ili motivacija da budu efikasniji. Nastavnici su najvažniji faktor koji utiče na učenje u školama (Ha-

## INTRODUCTION

Recent years have been a challenge and a critical crossroads in education sector. It is of immense importance to try to improve the current education system, but also to innovate the new system that we strongly need for our next generation. The Covid-19 crisis forced schools worldwide to wake up due to the lack of a way to deliver quality classes at a time when classical and brick schools cannot be accessed. Even before the Covid-19 Pandemic the World Bank in a 2018 report identified this learning crisis.

We can say that world is facing a global learning crisis in schools. The global education system as it stands today is struggling with outdated, high cost and location-bound education. Schools around the world still focus on teaching knowledge that the students memorize instead of focusing on teaching skills that the students need when entering work life. What we need today is an education system that will be competency-based with modern curriculum and that will be implemented through innovative digital instruments.

COVID-19 has forced governments to rapidly introduce or expand distance learning programs and the question is whether the prerequisites created for such rapid implementation have been quality established worldwide. Still, as the pandemic has shown the core of education and training relies on physical presence in a classroom and moving towards remote or blended learning has been cumbersome. Education and training have slowly, but surely digitized through online content, exams and digital textbooks. The field of education and training is also changing with regards to organization and pedagogy. Now there is a need for easy to use, user-friendly e-learning tools and new solution to use this window of opportunity that offers contextual learning for everyone regardless of the location.

The new normal in learning should include customized digital resources and learning platforms, bring personalized learning to each student (learning at their own pace and interest), show the progress, achievements and competencies of students from all activities and learning inside and outside the school and to improve students' self-awareness and understanding of their learning path.

Education has long been critical to human welfare, but it is even more so in a time of rapid economic and social change. Before COVID-19 shut schools down, the world was already in the midst of a global learning crisis that threatened countries' efforts to build human capital - the skills and know-how needed for the jobs of the future. Data from the World Bank and UNESCO showed that 53% of children at the end of primary in low- and middle-income countries even suffer from learning poverty (World Bank, 2019).

## 1. LITERATURE REVIEW

### 1. 1. Global educational system characteristics

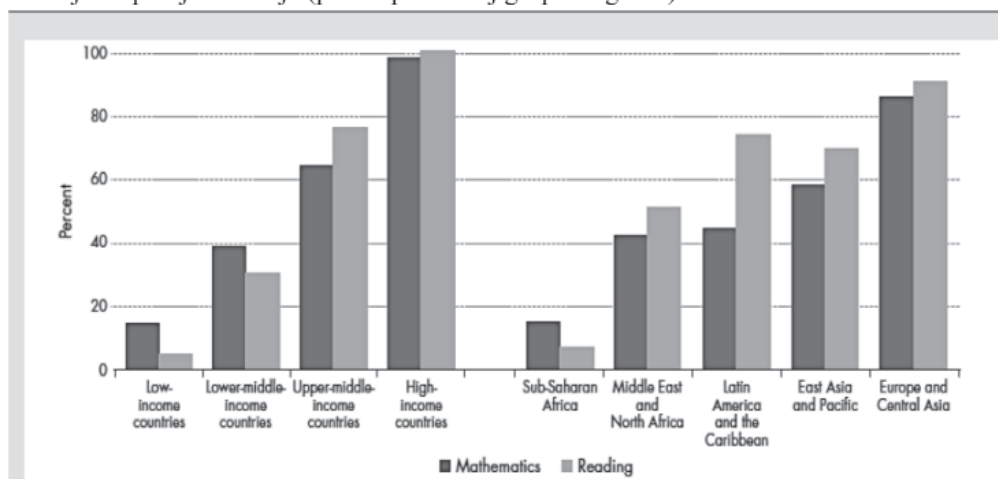
The World Bank 2018 Report identified learning crisis in schools and sorted them into three basic dimensions. In the further text we expound them and analyze.

#### 1) *Learning outcomes are poor: Low levels, high inequality, slow progress*

The learning that could be expected in schools based on formal curricula or the needs of employers often does not happen. Of even greater concern, many countries fail to provide learning for all students. Individuals who are already disadvantaged in society due to poverty, location, nationality, gender or disability learn the least. Thus, education systems can widen social gaps instead of narrowing them. In many developing countries over the past few decades, net enrollment in education has far outpaced the historical performance of today's industrialized countries. For example, it took the United States 40 years - from 1870 to 1910 - to increase the enrollment of girls from 57 to 88 percent. The number of years of schooling completed by the average adult in developing countries more than tripled from 1950 to 2010, from 2.0 to 7.2 years. This progress means that most gaps in primary school enrollment are closing between high- and low-income countries. Until 2008, the average low-income country enrolled students in primary school at almost the same rate as the average high-income country (Azevedo et al., 2020).

**Figure 1:** The percentage of primary school students who pass a minimum proficiency threshold

Prosjek učenika u kasnoj osnovnoj školi koji su postigli ocjenu iznad minimalnog nivoa znanja na procjeni učenja (prema prihodnoj grupi i regionu)



Source: World Bank Report 2018. Available on: <https://www.worldbank.org/en/publication/wdr2018>

#### 2) *Schools fail students in expectations*

Secondly, struggling education systems lack one or more of four key school-level ingredients for learning. First, children often arrive in school unprepared to learn. At the same time, teachers often lack

the skills or motivation to be effective. Teachers are the most important factor affecting learning in schools (Hanushek, 2011). The acquisition of knowledge by students largely depends on teachers' creativity, ideas and readiness to transfer knowledge. Third, inputs



nushek, 2011). Sticanje znanja od strane učenika u velikoj mjeri zavisi od kreativnosti nastavnika, ideja i spremnosti za prenos znanja. Treće, inputi često ne uspijevaju da dođu do učionica ili da značajnije utiču na učenje. Posvećivanje i obezbjeđivanje dovoljno resursa za obrazovanje je presudno (Robinson, Lloid i Rove, 2008;

Vaters, Marzano i McNulti, 2003). Iako školsko rukovodstvo ne utiče direktno na podizanje kvaliteta učenja učenika, to čini posredno, poboljšavanjem kvaliteta nastave i obezbjeđivanjem efikasne upotrebe resursa. Loše upravljanje i neadekvatan obim sredstava za obrazovanje često podrivaju kvalitet školovanja.

Slika 2. Četiri glavna faktora lošijih rezultata u klasičnom učenju



Izvor: Izvještaj Svjetske banke za 2018. Dostupno na: <https://www.worldbank.org/en/publication/wdr2018>

3) Sistemi propadaju u školama

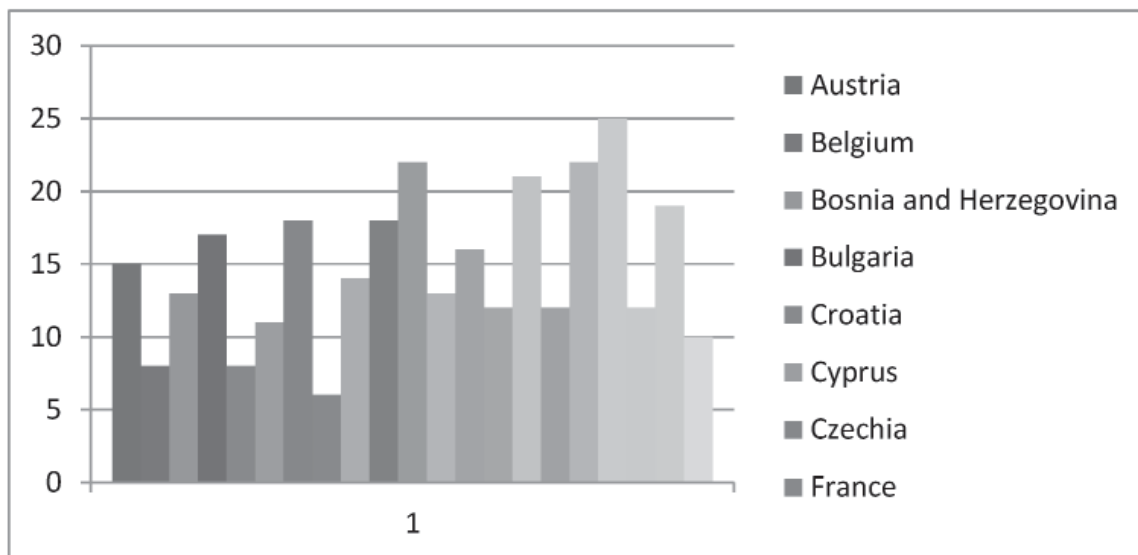
Tehnička složenost, administracija i politički uticaji često negativno utiču na obrazovne sisteme i učenje. Razni dijelovi sistema moraju biti usklađeni sa učenjem. Ali različiti akteri u sistemu imaju i različite ciljeve, a promovisanje učenja je samo jedan od njih. Nedostaci tokom školovanja na kraju se pokazuju kroz slabe vještine i kompetencije kada učenici stasaju za tržište rada. Budući da obrazovni sistemi nisu adekvatno pripremili buduće radnike, mnogi ulaze kao radna snaga sa neadekvatnim vještinama. Obrazovanje omogućava uzlaznu socioekonomsku mobilnost i ključ je za izbjegavanje siromaštva. Obrazovanje pomaže u smanjivanju nejednakosti i postizanju rodne ravnopravnosti i presudno je za podsticanje tolerancije i mirnijih društava. Globalni cilj je da svi steknu kvalitetno obrazovanje koje je temelj za poboljšanje života ljudi i održivi razvoj (Svjetska banka, 2018).

## 2. REZULTATI ISTRAŽIVANJA I DISKUSIJA

### 2.1. Pandemija COVID-19 i škole

Tokom prošle i ove godine svijet se bori sa neočekivanom i nevidljivom prijetnjom. Pod izazovom su se našli svi aspekti života, u suočavanju sa ekonomskim, humanitarnim i socijalnim posljedicama. Ipak, možemo reći da je ova kriza najviše pogodila obrazovni sistem. Zatvaranje škola zbog COVID-19 ostavilo je više od milijardu učenika van škole. Da bi se borile protiv COVID-19, više od 180 zemalja naložilo je privremeno ili potpuno zatvaranje škola, ostavljajući, na vrhuncu, početkom aprila, skoro 1,6 milijardi djece i omladine van škole. Do kraja maja 2020. godine, 20 školskih sistema se djelimično otvorilo, a oko 1,2 milijarde učenika ostalo je i dalje van škole (Svjetska banka, 2020).

Slika 3. Potpuno zatvaranje škola u odabranim evropskim zemljama zbog COVID-19 (izraženo u sedmicama)



Izvor: obrada autora, adaptirano sa UNESCO-ove globalne mape praćenja zatvaranja škola, <https://en.unesco.org/covid19/educationresponse>

often fail to reach classrooms or to affect learning when they do. Devoting enough resources to education is crucial (Robinson, Lloyd and Rowe, 2008; Waters, Marzano and McNulty, 2003). Although effective school leadership does not raise student learning directly,

it does so indirectly by improving teaching quality and ensuring effective use of resources. Poor management and governance often undermine schooling quality.

Figure 2: Four main factors of low results in classical learning



Source: Worldbank Report 2018. Available at: <https://www.worldbank.org/en/publication/wdr2018>

3) Systems are failing schools

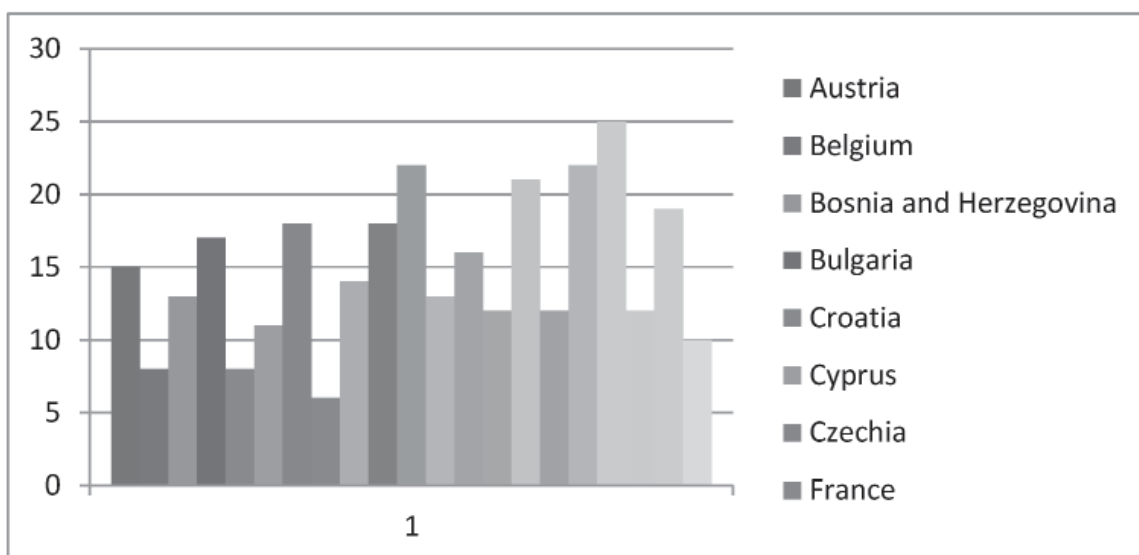
Technical complexities and political forces constantly pull education systems out of alignment with learning. The various parts of the system need to be aligned toward learning. But different actors in the system have other goals - some stated, some not. Promoting learning is only one of these, and not necessarily the most important one. Learning shortfalls during the school years eventually show up as weak skills in the workforce. Thus, the job skills debate reflects the learning crisis. Because education systems have not prepared workers adequately, many enter the labour force with inadequate skills. Education enables upward socioeconomic mobility and is a key to escaping poverty. Education helps reduce inequalities and reach gender equality and is crucial to fostering tolerance and more peaceful societies. The global target is for everyone to obtain a quality education which is the foundation for improving people's lives and sustainable development (World Bank, 2018).

2. RESULT AND DISCUSSION

2.1. Covid 19 & schools

During the past year the world is battling an unexpected and invisible threat. It challenged all aspects of life in dealing with economic, humanitarian and social consequences. The education sector is one of the most affected by this crisis. School closures due to COVID-19 have left more than a billion students out of school. To combat COVID-19, more than 180 countries mandated temporary school closures, leaving, at its peak in early April, close to 1.6 billion children and youth out of school. By the end of May 2020, 20 school systems had opened partially, and about 1.2 billion students remained out of school (World Bank, 2020).

Figure 3: Full school closures in selected Europe countries due to COVID-19 (in weeks)



Source: Author adaptation from the UNESCO global monitoring map of school closures <https://en.unesco.org/covid19/educationresponse>

Koje su procijenjene posljedice zatvaranja škola na duži period? Posljedice se mogu posmatrati sa više aspekata. Prije svega, neupitno je da je zatvaranje škola pomoglo sprečavanju širenja zaraze, i sa epidemiološkog stanovišta je potpuno opravdano. S druge strane, za sada se ne može reći da postoje određeni pozitivni efekti.

Zatvaranje škola može dovesti do skoka u broju napuštanja škole i dalje erozije u kvalitetu učenja. Prema autorima Aievedo i ostali (2020), povećane stope napuštanja škole jedan su od važnih kanala koji povezuju hitna zatvaranja škola i druge obrazovne poremećaje sa gubicima u prosječnom životnom postignuću. Generalno, kako djeca odrastaju, oportunitetni troškovi boravka u školi se povećavaju. To domaćinstvima može otežati opravdanje za slanje starije djece u školu nakon prisilnog prekida, posebno ako su domaćinstva pod finansijskim stresom. U epidemiji poliomijelitisa 1916. godine istraživači su pretpostavili da su djeca radnosposobnog uzrasta (13, u većini američkih država u to vrijeme) vjerovatnije napustila školu trajno nakon zatvaranja škola usljed te epidemije. Takvi efekti nisu ograničeni samo na iznenadne i neplanirane slučajeve u javnom zdravstvu. Smanjene stope upisa zabilježene su i u Indoneziji nakon ekonomskog prilagođavanja 1980-ih godina i turbulencija koje su se tada osjećale na tržištu.

Dokazi ukazuju na to da svaki prekid školovanja, uključujući planirane odmone, raspuste, može dovesti do gubitka učenja za mnogu djecu. Istraživanje Coopera i dr. (1996) otkriva da se u prosjeku rezultati uspjeha američkih učenika smanjuju za oko mjesec dana tokom tromjesečne ljetnje pauze. Kim i Kuinn (2013) otkrivaju da su ljetnim gubicima u kontinuitetu učenja posebno pogođeni studenti sa niskim primanjima. Slično tome, Alekander, Pitcock i Boulai (2016) otkrivaju da se oko 25 do 30 procenata učenja postignutog tokom školske godine gubi obično tokom ljetnjih praznika. Štaviše, prekidi tokom kritičnih stadijuma školovanja mogu dovesti do mnogo lošijih ishoda. Na primjer, prekid tokom trećeg razreda, kada učenici savladavaju čitanje, može dovesti do veće stope napuštanja škole i lošijeg životnog standarda u budućnosti.

Neki od neželjenih efekata jesu i objektivno prisiljavanje roditelja mlađe djece da odsustvuju s posla, uzimaju slobodne dane da bi pratili nastavu s njima putem elektronskih medija i pomažu im da savladaju gradivo. Takođe, nedostupnost ili ograničenja interneta i medijskih sredstava komunikacije znatno otežavaju izvođenje onlajn vrste nastave.

Dugoročni efekti pandemije COVID-19 sada sugerišu da će posljedice biti značajne i trajne. Pored procjena neposrednih uticaja, u literaturi takođe nalazimo činjenice dugotrajnih posljedica šokova i roditeljske zabrinutosti zbog bezbjednosti u školama vezano za zarazne bolesti. Meiers i Thomasson (2017) dokumentuju da čak i nakon što su škole ponovo otvorene, mnogi roditelji nisu bili voljni da puste djecu da je pohađaju. Autori su otkrili da su mladi ljudi koji su tokom pandemije imali između 14 i 17 godina kasnije pokazali niže opšte obrazovanje u poređenju sa nešto starijim vršnjacima.

## 2.2. Učenje na daljinu i novo normalno u učenju

COVID-19 primorao je sve zemlje da uvedu onlajn predavanja ili da prošire programe učenja na daljinu. Idealni preduslovi za tako brzo uvođenje novog sistema učenja nisu obezbijedjeni u svim zemljama.

Strategije ublažavanja u vrijeme COVID-19 često se nazivaju učenje na daljinu – ono se izvodilo na različite načine: putem domaćih zadataka na papiru, programima na televiziji, radiju, preko mobilnih telefona, tekstualnih poruka i, svakako, uz internet podršku. Ono što se postavlja kao aktuelno pitanje jeste efikasnost tako oštrog prelaska na alternativne modalitete učenja tokom zatvaranja škola, u odnosu na dosadašnje klasično učenje.

### 2.2.1. Učenje na daljinu

Zvanične informacije o pandemiji COVID-19 ukazuju na to da je pogodeno više od milijardu djece širom svijeta (UNESCO). Djeca širom svijeta imaju veoma različite načine učenja dok su škole zatvorene. Obrazovni sistemi ovo pokušavaju da ublaže pružanjem učenja na daljinu. Učenje na daljinu pruža priliku učenicima i nastavnicima da ostanu povezani i angažovani sa nastavnim sadržajem dok rade od kuće. Mogućnosti za učenje na daljinu su obično povezane sa vanrednim situacijama koje predstavljaju prijetnju za sigurnost učenika i nastavnika.

Ovaj način predavanja razlikuje se od virtuelne škole ili programa virtuelnog učenja. Oni obično predstavljaju zvanični proces osnivanja škole, usvajanja mrežnog kurikuluma i stvaranja posebne strukture za podršku učenicima upisanim u školu. E-učenje koristi elektronske tehnologije za pristup obrazovnom programu izvan tradicionalne učionice. Struktura učenja na daljinu određuje uspjeh učenika i nastavnika sa iskustvom. Učenje na daljinu često kod učesnika izaziva dodatni stres, pa je važno ne dodavati više dužnosti nastavnicima i učenicima od redovne nastave. Da bi učenje na daljinu bilo efikasno, mora postojati dobro razvijena struktura koja će moći da podrži definisani kurikulum.

Kao što pokazuje praksa, glavni problem i razlike između škola i država postoje u odnosu na dostupnu tehnologiju. Tehnologija se može razlikovati u improvizovanim okruženjima za učenje na daljinu. Ako škole dozvoljavaju učenicima da nose mobilne aparate ili laptope iz kuće, tada bi učenici trebalo da dolaze spremni za učenje. Neke škole nemaju uređaje koje učenici mogu ponijeti kućama, pa učenici moraju da pronađu načine za pristup materijalima obezbijeđenim kroz tehnološke sisteme. Škole koje do sada nisu imale učenje na daljinu ili virtuelno učenje, moraju da obezbijede alternativne načine za učenike da primaju i vraćaju zadatke. Škole moraju da pruže vrlo jasne informacije o tome kako da pristupe bilo kojoj mrežnoj platformi tokom učenja na daljinu, posebno ako učenici, roditelji i nastavnici nisu navikli da redovno koriste takve alate. Tehničku podršku takođe treba da obezbijedi u cijelo okruženje, a ne samo da bude odgovornost nastavnika, koji drži nastavu na daljinu. Jasne informacije koje opisuju korake za rješavanje problema i kontakt informacije za dodatnu tehničku podršku trebalo bi da budu lako dostupne svima.

Učenje na daljinu nikada nije toliko efikasno kao nastava u učionici. Teško je kognitivno angažovati djecu sa svim distrakcijama u domaćinstvu, uređaji moraju da se dijele između braće i sestara, a porodicama može biti teško da prate cijeli televizijski program. Štaviše, pristup televiziji ili internetu, glavnim kanalima pružanja učenja na daljinu, uglavnom je nejednak. Na sljedećem grafikonu možemo vidjeti procjenu dostupne tehnologije za učenje na daljinu u BiH za 2016. godinu, prije pandemije virusa korona.

**Slika 4. Raspoloživa tehnologija za učenje na daljinu u BiH**

COVID-19 education indicators		Year	Source	Value
Households with Internet access	Total	2016	UNICEF Databases	50%
Households with personal computer	Total	2016	UNICEF Databases	45%

Izvor: UNICEF (2020), Education and COVID-19. Dostupno na: <https://data.unicef.org/topic/education/covid-19/>

What are the consequences of closing schools for a longer period? The consequences can be viewed from several aspects. First of all it is unquestionable that it helped prevent the spread of the infection and from the epidemiological point of view it is completely justified. On the other hand we do not have positive effects. School closures may lead to a jump in the number of dropouts and an erosion of learning.

According to the authors Ayevedo et al. (2020), increased dropout rates are one important channel linking emergency school closures and other educational disruptions to losses in average lifetime educational attainment. In general, as children age, the opportunity cost of staying in school increases. This may make it harder for households to justify sending older children back to school after a forced interruption, especially if households are under financial stress. In the 1916 polio epidemic, researchers hypothesize that children of legal working age (13 in most U.S. states at that time) were more likely to leave school permanently following epidemic-related shutdowns. Such effects are not restricted to public-health emergencies. Reduced enrollment rates were also observed in Indonesia after economic adjustment in the 1980s.

Evidence indicates that any interruption in schooling, including scheduled vacations, can lead to a loss of learning for many children. Cooper et al. (1996) find that, on average, U.S. students' achievement scores decline by about a month's worth during the three-month summer break. Kim and Quinn (2013) find that students from low income background are particularly affected by summer learning loss. Similarly, Alexander, Pitcock, and Boulay (2016) find that around 25 to 30 percent of learning achieved over the school year is typically lost during summer holiday periods. Moreover, interruptions during critical schooling stages of life can lead to much worse outcomes. For example, an interruption during third grade, when students are mastering how to read, may lead to higher dropout rates and worse life prospects including poverty.

Some of the side effects are forcing parents of younger children to be absent from work, taking days off to follow classes with them through electronic media, and helping them master the material. Also, the unavailability or limitations of the Internet and media means of communication make it significantly more difficult to conduct this type of teaching.

The long-term effects of COVID-19 now suggest that consequences will be large and lasting. Beyond estimates of immediate impacts, the literature also provides some insights on the long-lasting impacts of shocks and resulting parental concerns around school safety. Meyers and Thomasson (2017) document that even after schools reopened, many parents were reluctant to let their children attend. The authors found that young people who were aged 14-17 during the pandemic, later showed lower overall educational attainment compared to slightly older peers.

**2.2. Remote learning and new normal in learning**

COVID-19 has forced the government to rapidly introduce or expand distance learning programs and it is unlikely that the ideal preconditions for such a rapid introduction have been established around the world. Mitigation strategies at the time of COVID-19 are often referred to as distance learning - it was delivered in different ways: homework sheets on paper, radio, TV, mobile phones, text messages and the In-

ternet, both directed by an instructor and self-propelled. What is being raised as a topical issue is the effectiveness of the sharp transition to alternative learning modalities that governments provide during school closures.

*2.2.1. Remote learning*

The officially identified pandemic of COVID-19 is impacting more than billion children worldwide (UNESCO). Students around the world are having very disparate ways of learning as schools are closed. Educational systems try to mitigate this by providing remote learning.

Remote learning provides an opportunity for students and teachers to remain connected and engaged with the content while working from their homes. Opportunities for remote learning are typically linked to emergency situations that pose a threat to student safety. Transitioning to remote learning can keep students on track to complete a work and to be ready for any scheduled assessments. Many of the requirements in a traditional classroom environment will be in play for remote learning environments, and the goal is to adhere to as many state and local requirements as possible.

This way of teaching is different from a virtual school or a virtual learning program. They usually represent the official process of establishing a school, adopting an online curriculum, and creating a special structure to support students enrolled in school. eLearning uses electronic technologies to access an educational program outside the traditional classroom. The structure of distance learning will determine the success of students and teachers with experience. Distance learning is often called in times of stress, so it is important not to add more duties to teachers and students. For distance learning to be most effective, there must be a well-defined structure that will be able to support a well-developed curriculum.

As practice shows, the main problem and differences exist from the available technology. Technology can vary in improvised distance learning environments. If schools allow students to carry home appliances, then students should be ready to learn. Some schools do not have devices to send home, so students must find ways to access the materials provided through technology systems. Districts that do not typically engage in distance learning or virtual learning in their traditional calendars must provide alternative ways for students to receive and return assignments. Schools need to provide very clear information on how to access any online platform during remote learning, especially if students, parents and teachers are not accustomed to using such tools on a regular basis. Technical support also needs to be provided throughout the district and not be the responsibility of the teacher, who will have enough to keep up with in the remote learning environment. Clear information describing steps for troubleshooting and contact information for additional technical support should be easily available for everyone.

Remote learning is never as effective as classroom instruction. It is hard to keep children engaged cognitively with all the distractions in the household, devices have to be shared between siblings, and it can be hard for families to decipher television programming. Moreover, access to a television or internet the main channels of delivering remote learning is highly unequal. In the following graph we can see the estimate of accessible remote assets technology in BiH for 2016, before virus crisis.

**Figure 4: Remote assets technology in BiH**

COVID-19 education indicators		Year	Source	Value
Households with internet access	Total	2016	UNICEF Databases	50%
Households with personal computer	Total	2016	UNICEF Databases	45%

Source: UNICEF data (2020), Education and COVID-19. Available at: <https://data.unicef.org/topic/education/covid-19/>



Prema najnovijim podacima iz UNICEF-ovog izvještaja, u mnogim zemljama sa nižim prihodima mogućnosti onlajn učenja imaju ograničenu dostupnost. Ne samo da mnogim domaćinstvima nedostaju internet veze, već i kada su dostupne, one možda neće biti dovoljno brze za preuzimanje. Pored toga, domaćinstva možda nemaju računar ili možda nemaju dovoljan broj za upotrebu roditeljima i djeci ili za više djece. Ako u obrazovnim politikama nedostaju informacione tehnologije, osnovni uslovi koji omogućavaju povezanost, pristup uređajima, kvalitetan sadržaj, praćenje i podrška, izostaju, a nastavnici i učenici neće imati minimalne uslove da integrišu tehnologiju za podršku njihovom učenju. Uspješna strategija učenja na daljinu oslanja se na višestruke pristupe putem interneta. COVID-19 je pokazao da postoji digitalni jaz i razlike koje nesrazmjerno utiču na siromašne zemlje i siromašne zajednice u zemljama. Za zemlje sa visokim prihodima, efikasnost ublažavanja može se kretati od 15% do 60%, što takođe odražava i veći pristup domaćinstvima tehnologiji i očekivanu efikasnost onoga što se nudi. U zemljama sa nižim i srednjim prihodom, taj razmjer se kreće od 7% do 40%, jer je pristup domaćinstava računarima, internetu i mobilnim telefonima znatno bolji. Efikasna upotreba digitalne tehnologije vođena je ciljevima učenja i poučavanja, a ne određenom tehnologijom. Nova tehnologija ne dovodi automatski do većeg postignuća. Istraživanja su pokazala da obrazovne promjene ne odgovaraju situaciji u kojoj nastavnici i učenici mogu jednostavno zamjeniti učenje uz pomoć računara i tradicionalno učenje na bilo kom nivou i sa istim rezultatom (Bettinger i ostali, 2020).

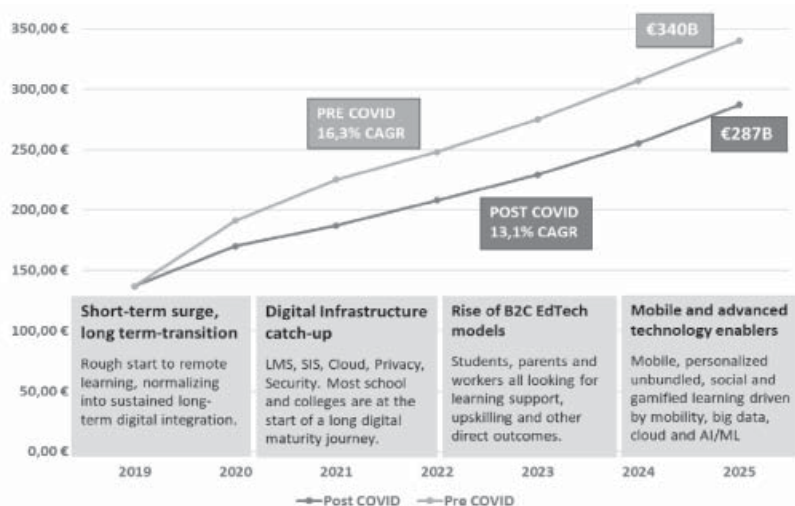
Motivacija učenika da koriste tehnologiju ne znači uvijek i efikasnije učenje, posebno ako upotreba tehnologije i željeni ishodi učenja nisu usko povezani.

### 2.2.2. Nova normalnost u nastavi i e-učenje

Pandemija COVID-19 pokazuje da škole globalno nisu bile i još uvijek nisu pripremljene za isključivo onlajn inovativno obrazovanje putem e-učenja. Oštar prelazak na novi oblik nastave primorao je škole da shvate potrebu za učenjem na mreži i ubrzao je prihvatanje onlajn i inovativnih modela nastave. Ovo treba gledati kao priliku da nova škola postane „novo normalno“ u obrazovanju. Osnova za prelazak na digitalnu nastavu, kako za postojeće, tako i za nove modele, jesu šira očekivanja potrošača vezano za tehnologiju, a u pogledu mobilnosti, personalizacije, socijalnog i gamifikovanog učenja. Učenje putem interneta, iz perspektive tržišta, ima dovoljno prostora za kontinuirani rast čak i izvan pandemije.

Tržište ulaganja u infrastrukturu obrazovanja procjenjuje se na 9.000 milijardi evra, a rast iznosi 4,9% CAGR<sup>1</sup> i procjena je da će dostići 16.000 milijardi evra do 2030<sup>2</sup>. Privatne investicije, digitalizacija i novi načini rada služe kao pokretači rasta ovog tržišta. Trenutno je manje od 3% globalnih troškova za obrazovanje povezano sa tehnologijom. Međutim, očekuje se da će se digitalna potrošnja brzo povećati jer se predviđa njen porast na 342 milijarde dolara do 2025. godine. Broj stanovnika kontinuirano raste, a zemlje intenzivno ulažu u obrazovanje.

Slika 5. Globalni izdaci za ulaganje u tehnologiju obrazovanja, milijarde USD



Izvor: HolonIQ, 2020<sup>3</sup>. Dostupno na: <https://www.holonIQ.com/notes/global-education-technology-market-to-reach-404b-by-2025/>.

Očekuje se da će se kratkoročni rast potrošnje na tehnologiju koja se koristi u nastavi, a do koje je došlo usljed COVID-19, proširiti na dugoročnu integraciju digitalnih tehnologija i prelazak na mnogo veće usvajanje onlajn obrazovanja tokom narednih godina. Dio ove tranzicije uključuje značajnu infrastrukturu potrebnu za upravljanje učenjem, podacima i administracijom, jer je većina škola i fakulteta još uvijek na samom početku dugog digitalnog putovanja. EdTeh modeli su u porastu kako studenti, roditelji i nastavnici sve više traže podršku u učenju, savladavanju gradiva i usavršavanju za dodatne i direktnije ishode učenja i rezultate.

Da li će učenje putem interneta postati novo normalno u post-COVID svijetu? Kriza je efikasno ubrzala dugoročne strukturne promjene u načinu na koji studenti uče. Ove promjene bismo vjerovatno vidjeli u narednih nekoliko godina i bez krize, ali činjenica je da nova si-

tuacija ima značajan uticaj. Možemo prepoznati nekoliko prednosti e-učenja. Prije svega, pristup učenju za sve učenike – bilo kada i bilo gdje. Širenje pristupa na načine koji dramatično smanjuju troškove pristupa kvalitetnim obrazovnim resursima i iskustvima, na udaljenim lokacijama ili u situacijama kada izazovi poput slabog upisa učenika čine tradicionalni školski model nepraktičnim.

Tradicionalne škole se još uvijek ne fokusiraju dovoljno na upotrebu tehnologije kao mogućnosti učenja. Bolje korišćenje vremena nastavnika i učenika automatizacijom rutinskih zadataka omogućava nastavnicima da se fokusiraju na aktivnosti visoke vrijednosti. Činjenica je da mnoge države sa niskim i srednjim prihodima nisu mogle da pruže podršku svim studentima tokom pandemije COVID-19, pa je neophodno svim učenicima obezbijediti kvalitetan pristup obrazovanju. Takođe, personalizovano učenje nadovezuje

<sup>1</sup> Složena godišnja stopa rasta (CAGR – Compound annual growth rate) mjeri stopu povraćaja za investiranje preko perioda investiranja, najčešće pet ili 10 godina.

<sup>2</sup> Goldman Sachs, The Future of Learning: Transforming Education in the digital era (2019).

<sup>3</sup> HolonIQ je industrijska platforma koja pruža podatke i analizu razvoja na svjetskom tržištu obrazovanja.

According to the latest data from a UNICEF report, in many lower-income countries, online learning options have limited utility. Not only do many households lack internet connections, but when available, these may not be fast enough for downloading. In addition, households may have no computer or, might not have a sufficient number for the parents and children to use, or for multiple children to use. If ICT in education policies lack the basic enabling factors (connectivity, access to devices, quality content, and teacher training, monitoring, and support), it is more likely that teachers and students will not have the minimum conditions to integrate the technology to support their learning. A successful remote learning strategy relies on multiple delivery approaches. COVID-19 has exposed the digital divide and the differences that disproportionately impact poor countries and poor communities within countries. For high-income countries, mitigation effectiveness could range from 15% to 60%, also reflecting both greater household access to technology and the expected effectiveness of what is offered. In lowermiddle and upper-middle income countries, the ability of governments to mitigate this shock may be higher, ranging from 7% to 40%, since household access to computers, the internet, and mobile phones are significantly better.

Effective use of digital technology is driven by learning and teaching goals rather than a specific technology. New technology does not automatically lead to increased attainment. An important finding is that educational production does not appear to fit a situation in which teachers and students can simply substitute between computer assistive learning and traditional learning at any level with the same result (Bettinger et al., 2020). Students' motivation

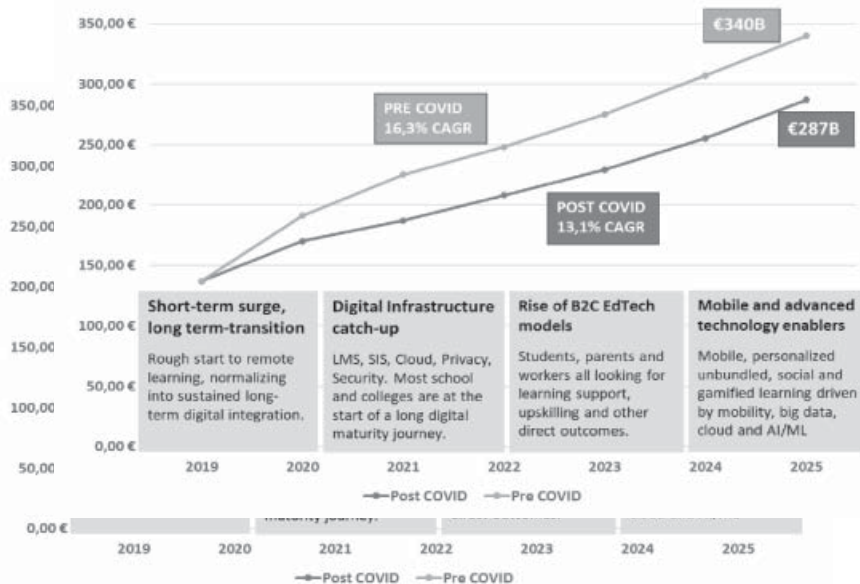
to use technology does not always translate into more effective learning, particularly if the use of technology and the desired learning outcomes are not closely aligned.

2.2.2. Impact of new normal and e-learning

The Covid-19 Pandemia proves that schools globally have not been and still are not prepared for online or innovative education through e-learning. The sharp transition to a new form of teaching has forced them to understand the need for online learning and has accelerated the acceptance to online and innovative models. This should be seen as an opportunity for a new school to become the "new normal" in education. The basis for the transition to digital, for both existing and new models, are the broader expectations of consumer technology in terms of mobility, personalization, social and gamified learning.

Online learning, from a market perspective, has ample room for continued growth even beyond the pandemic. Education is estimated over €9000B industry, growing at CAGR<sup>1</sup> 4.9% reaching €16000B by 2030.<sup>2</sup> Private investments, digitalisation and new ways of working serve as market growth drivers. Currently, less than 3% of global education expenditure is technology related. However, the digital spend is expected to increase rapidly as it is forecasted to grow to \$342b by 2025. The population is growing and the countries in the regions are heavily investing in education. Especially the private school sector is growing rapidly, but investments still result in an outdated way of teaching and organizing education.

Figure 5: Global EdTech expenditure, USD billions



Source: HoloniQ, 2020<sup>3</sup>. available on: <https://www.holoniq.com/notes/global-education-technology-market-to-reach-404b-by-2025/>

The short-term increase in EdTech spending brought on by COVID-19 is expected to widen to a longer-term integration of digital technologies and transition to much higher adoption of online education over the coming years. Part of this transition includes significant infrastructure required for managing learning, data and administration as most schools and colleges are still at the very start of a long digital maturity journey. EdTech models are on the rise as students, parents and workers increasingly seek learning support and up-skilling for supplemental and more direct academic and career outcomes.

Will online learning become the new normal in a Post-COVID World? The crisis has effectively accelerated long-term structural changes in the way students learn. We would probably see these changes in the next few years even without the crisis, but the fact is that the new situation has significant impact. We can recognize several benefits of e-learning. First of all, access to learning for all students – anytime and anywhere. Broadening access in ways that dramatically reduce the cost of access to quality educational resources and experiences, in remote locations or situations where challenges such as low student enrolments make the traditional school model impractical.

<sup>1</sup> Compound annual growth rate (CAGR) is the rate of return that would be required for an investment to grow from its beginning balance to its ending one.  
<sup>2</sup> Goldman Sachs: "The Future of Learning: Transforming Education in the digital era" (2019)  
<sup>3</sup> HoloniQ is an industry intelligence platform that provides data and analysis of developments in the global education market

se na studentska interesovanja, što može rezultirati povećanom motivacijom, smanjenim vremenom potrebnim za rješavanje zadataka i na kraju boljim ishodima učenja.

Na kraju, sa pomenutim razvojem alata za e-učenje i digitalnim učenjem, neophodno je prilagoditi nastavni plan i program koji je spreman za budućnost i usredsrediti se na učenje kako učiti. Kurikulumi koji ne prate trendove i nove potrebe tržišta uzrokuju loše ishode učenja. Očekuje se da će škole i vlade smanjiti troškove obrazovanja i poboljšati održive ishode učenja. Inkluzivno obrazovanje koje pruža pristup učenju za svako dijete i omladinca bez obzira na to sa kojom se poteškoćom može suočiti.

Uprkos ovim prednostima, nedavna istraživanja Hewa i ostalih (2020), putem anketiranja 11.141 članova fakulteta iz 131 američke institucije pokazuje da samo 9% fakulteta više voli da predaje u potpunosti onlajn. Drugim riječima, ostalih 91% koledža ne želi da predaje u potpuno umreženom okruženju. Mišljenja studenata o potpuno onlajn predavanjima nisu mnogo bolja. Nedavno studentsko istraživanje koje je sproveo EDUCAUSE na više od 40.000 studenata na 118 američkih univerziteta pokazalo je da čak 70% ispitanika generalno ili potpuno preferira okruženja za učenje licem u lice, dakle klasičnim predavanjima (Gierdovski, 2019).

Onlajn učenje je često stigmatizovano kao slabija opcija koja pruža obrazovanje nižeg kvaliteta od učenja licem u lice (Hodges i dr., 2020). Stoga mnogi studenti ne vide vrijednost sveobuhvatnog učenja isključivo na mreži, uprkos činjenici da onlajn učenje u određenim oblicima postoji već decenijama.

## ZAKLJUČAK

Obrazovanje predstavlja unutrašnju vrijednost, koja omogućava pojedincima da ostvare svoje pune potencijale u svim oblastima života. Ono ima presudnu ulogu u njihovom intelektualnom, moralnom, društvenom, kreativnom i fizičkom razvoju i promovisanju osnovnih socijalnih i građanskih vrijednosti, kao što su jednakost, tolerancija, poštovanje, društvena angažovanost i jačanje socijalne kohezije. Potreba za novim vještinama i kompetencijama zahtijeva od pojedinca doživotno učenje kako bi mogao odgovoriti na dinamične promjene zahtjeva na tržištu rada. Funkcionalna znanja i vještine, motivacija za učenje, stavovi i vrijednosti neophodne za formiranje nacionalnog i kulturnog identiteta neophodni su za aktivan i konstruktivan život u savremenom društvu.

Ubrzan tehnološki razvoj postavlja nove izazove za sve nivoe obrazovanja, a međupovezanost obrazovanja sa ekonomskim, političkim i kulturnim razvojem jednog društva postaje izraženija. Unapređenje kvaliteta obrazovanja ima suštinski značaj jer se smatra presudnim za razvoj inovativnosti, međunarodnu konkurentnost i ekonomski razvoj jedne ekonomije. Da bi se u nacionalnoj privredi ostvarila ekonomska isplativost obrazovanja, neophodno je uskladiti obrazovne programe i tržište rada, obezbijediti primjenjiva znanja i vještine, posebno iz razloga transformacije tradicionalnog koncepta privređivanja u sferu digitalnog poslovanja.

Izbijanje pandemije COVID-19 primoralo je mnoge škole i fakultete da se odmah prebace na onlajn predavanja. Čak i kad su bile dostupne mrežne alternative, nastavnici i učenici širom svijeta suočavali su se sa poteškoćama u smislu pristupa, sadrža i kvaliteta e-učenja ili čak pristupa internetu. Zatvaranje škola može dovesti do povećanja stope napuštanja škole, jer postoji značajna veza između prekida nastave i drugih obrazovnih poremećaja sa gubicima u prosječnom životnom postignuću u obrazovanju. Usljed krize izazvane virusom korona, pokazala se snažna potreba za novim

obrazovnim modelom koji će biti „novo normalno“ kao rješenje za škole širom svijeta. Rješenja za digitalno učenje mogu ponuditi zanimljive mogućnosti za korišćenje multimedijalnih informacija i primjenu akademskih i profesionalnih vještina za rješavanje stvarnih problema i situacija koje se mogu povezati, simulirati ili izraziti kao virtuelna stvarnost u školama.

Nemogućnost fizičkog pristupa školi ili radnom mjestu ne bi trebalo da spriječi obrazovanje i razvoj vještina. U osnovi novog normalnog je vjerovanje da učenik uči kroz interakciju sa svojom okolinom, bilo da je to fizičko ili digitalno okruženje. Iako se očekuje da će ulaganje u obrazovanje u svijetu neprestano rasti, očekuje se da će internet tržište rasti mnogo bržim tempom. Tehnologija se može koristiti za masovnu personalizaciju obrazovanja i poboljšanje ishoda učenja; radi se na interesovanjima učenika, što rezultuje povećanom motivacijom, smanjenjem vremena izvršenja zadataka i, na kraju, boljim ishodima učenja.

Cilj održivog razvoja za kvalitetno obrazovanje za sve treba da obezbijedi sveobuhvatno i pristupačno rješenje za učenje, a e-učenje takođe pomaže da se postigne cilj da se značajno poveća broj mladih i odraslih sa odgovarajućim vještinama, neophodnim za tržište rada. COVID-19 primorao je države da razviju pametnije i održive strategije za pružanje kvalitetnog obrazovanja za sve, omogućavajući djeci da uče bilo gdje i u bilo koje vrijeme. Uvažavajući potrebu i važnost predavanja uživo i licem u lice, neizbježno je prilagoditi novu normalnost i prema e-učenju koje je složen proces, ali ovaj proces je takođe neophodan za poboljšanje nivoa kvaliteta obrazovanja i poslije COVID-19 pandemije.

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Traditional schools still do not focus enough on the use of technology as a learning opportunity. Better use of teacher and student time by automating routine tasks allows teachers to focus on high-value activities. The fact is that many low- and middle-income countries have not been able to provide support to all students during the Covid-19 pandemic, so it is necessary to provide quality access to education for all students. Also, personalized learning builds on student interests, which can result in increased motivation, reduced task time, and ultimately better learning outcomes.

Finally, with the mentioned development of e-learning and digital learning tools, it is necessary to adjust the curriculum that is ready for the future and focus on learning how to learn. Curriculum that does not follow trends and new market needs cause poor learning outcomes. Schools and governments are expected to reduce education costs and improve sustainable education outcomes. Inclusive education that provides access to learning for every child no matter what disability they may face.

Despite these advantages, recent research by Hew et al. (2020), shows surveys of 11,141 faculty members from 131 U.S. institutions found that only 9% of faculty prefer to teach entirely online. In other words, a whopping 91% of colleges don't want to teach in a fully networked environment. Students' opinions about completely online lectures are not much better. A recent student survey conducted by EDUCAUSE on more than 40,000 students at 118 U.S. universities found that as many as 70% of respondents generally or completely prefers face-to-face learning environments (Gierdowski 2019).

Online learning is often stigmatized as a weaker option that provides lower quality education than face-to-face personal learning (Hodges et al. 2020). Therefore, many students do not see the value of comprehensive learning exclusively online, despite the fact that online learning has existed for many decades.

## CONCLUSION

The importance of education as an integral element of quality life and a key driver of sustainable development has clearly increased globally. Capacity in education for sustainable development can be developed through various modalities, such as face-to-face training, professional exchanges, online courses as well as introducing digital learning solutions. Education and training have slowly, but surely digitized through online content, exams and digital textbooks. Still, as the pandemic has shown the core of education and training relies on physical presence in a classroom and moving towards remote or blended learning has been cumbersome.

The outbreak of COVID-19 has forced many schools and colleges to immediately switch to online delivery of lessons. Even if online alternatives are available, teachers and learners around the world struggled with usability, content and quality of e-learning or even with access to internet. School closures could lead to increased dropout rates since there is important link between school closures and other educational disruptions with losses in average lifetime educational attainment. This highlights the importance of increasing the readiness of education systems to teach children at the right level. Covid-19 was a wake-up call for the strong need for a new education model that will be the "new normal" education solution to schools worldwide. Digital learning solutions can offer engaging opportunities for utilising multimedia information and applying academic and vocational skills to solving real work problems and situations that could be connected, simulated, or expressed as virtual reality in schools.

Inability to physically access a school or a workplace should not prevent education and skills development. At the core of new normal is a belief that pupil learn through interacting with their environment, whether that environment is physical or digital. While education spend in the world is expected to grow constantly the online market is expected to grow with much more rapid pace. Through integrating technology and adopting various blended learning models, the capital intensity of delivering education can be lowered substantially. Technology can be used to scale the mass personalization of education and improve outcomes of learning; it builds on student interests, which result in increased motivation, decreased time on task, and ultimately better learning outcomes.

The sustainable development goal for quality education for all, and through offering a cheap and accessible learning solution, e-learning helps to reach the goal of substantially increasing the number of youth and adults who have relevant skills, including technical and vocational for employment, decent jobs and entrepreneurship. COVID-19 has compelled countries to develop smarter and sustainable strategies for delivering quality education for all, enabling children to learn anywhere and in any time. While respecting the need and importance for live and face-to-face lectures, it is inevitable to adapt a new normal in e-learning which is complex process, but this process is also necessary to improve education both during and after the COVID -19 pandemic.

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ORIGINALNI NAUČNI RAD

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# Efekti listiranja na berzu – veze između broja listiranih akcionarskih društava i ekonomskih pokazatelja ekonomije

## Effects of listing on the stock exchange. Correlation between the number of listed joint stock companies and economic indicators of economy.

### Rezime

Empirijska rasprava o efektima početne javne ponude (IPO) nikada ne jenjava. Finansiranje putem inicijalne javne ponude akcija (engl. initial public offering – IPO) jedan je od načina prikupljanja sredstava za tekuće ili razvojne potrebe društva. IPO predstavlja prvu javnu ponudu akcija nekog društva potencijalnim investitorima i odvija se na primarnom tržištu kapitala, odnosno berzi. Ovaj rad ispituje prednosti i nedostatke procesa listiranja na berzu i delistiranja sa nje. Predmet rada odnosi se na analizu efekata inicijalne javne ponude. Cilj rada je analizirati sve relevantne faktore koji utiču na rezultat inicijalne javne ponude akcija, identifikovati motive zbog kojih se društva odlučuju na IPO, ali i analizirati motive i efekte procesa delistiranja društva sa berze. U istraživanju su korištene metode analize, sinteze, dedukcije, kao i odabrani alati poslovne i finansijske analize. Primarno su korišteni sekundarni izvori podataka, poput naučne i stručne literature, te javno dostupnih statističkih baza podataka. U drugom dijelu istraživanja ispituje se veza između broja listiranih akcionarskih društava u zemlji, BDP-a per capita, broja stanovnika, tržišne kapitalizacije i indeksa razvoja finansijskog tržišta. Rezultati pokazuju da postoji slaba veza između broja listiranih kompanija i broja stanovnika i broja listiranih kompanija i indeksa razvoja finansijskog tržišta, ali da ne postoji veza između broja listiranih kompanija i BDP-a po glavi stanovnika, odnosno veličine tržišta istraženog kao odnos tržišne kapitalizacije u odnosu na BDP.

**Ključne riječi:** inicijalna ponuda akcija, privredno društvo, akcionarsko društvo, listiranje na berzu.

JEL klasifikacija: D21, G11, L21, L25, M13.

### Abstract

The empirical debate on the effects of the initial public offering (IPO) never subsides. Financing through the initial public offering of shares is one of the ways to raise funds for the current or development needs of the company. An IPO is the first public offering of a company's shares to potential investors and takes place on the primary capital market, ie the stock exchange. This paper examines the advantages and disadvantages of listing and delisting. The subject of the paper refers to the analysis of the effects of the initial public offering. The aim of this paper is to analyze all relevant factors that affect the result of the initial public offering of shares, to identify the motives for which companies decide to IPO, but to analyze the motives and effects of the process of delisting the company from the stock exchange. The research used methods of analysis, synthesis, deduction, as well as selected tools of business and financial analysis. Secondary data sources, such as scientific and professional literature, and publicly available statistical databases were also used. In the second part of this research, the relationship between the number of listed joint-stock companies in the country GDP per capita, population, market capitalization and financial market development index is examined. The results show that there is a weak relationship between the number of listed companies and the number of residents and the number of listed companies and the financial market development index, but that there is no relationship between the number of listed companies and GDP per capita, ie the size of the market.

**Keywords:** initial offer of shares, company, joint stock company, listing on the stock exchange.

JEL Classification: D21, G11, L21, L25, M13.

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## UVOD

Inicijalna javna ponuda akcija (IPO) nije faza koju sva privredna društva dostignu, ali je kritična faza u procesu rasta i razvoja privrednog društva. Iako neki preduzetnici aktivno traže mogućnost pristupa javnim tržištima akcija putem IPO, većina privrednih društava ostaje u privatnom vlasništvu. Privrednim društvima koja pokreću poslovanje nije lako izaći na tržište u kratkom vremenskom periodu. Uprkos tome, visokotehnološka privredna društva s nesigurnim poslovima – na primjer, pokretanja biotehnologije za otkrivanje lijekova – često traže pristup javnim tržištima akcija putem IPO, uprkos nedostatku poslovne istorije i evidencije o poslovanju.

Ideja emitovanja akcija vjerovatno je toliko stara da je nije moguće datirati. Poznato je da se akcijama (lat. partes) u kompanijama (lat. publicani) trgovalo u blizini hrama Kastora u antičkom rimskom forumu (Shiler, 2015). Novi zamah akcionarstvo je dobilo u renesansnoj Italiji, a prvo regulisano tržište akcija postalo je amsterdamsko, u 17. vijeku. Prema Shileru, osnova koncepta uvijek je bila „slobodno udruživanje i trgovanje akcijama koje kao rezultat ima maštovito korištenje kapitala za nove ideje i nove poslovne smjernice“. Premda većina tih ideja doživi neuspjeh, neke će uspjeti i u cijelosti donijeti ekonomski razvoj društvu, a svojim akcionarima natprosječne prinose.

Akcije su dokumenti koji pismeno potvrđuju koliko iznosi učešće akcionara u imovini nekog akcionarskog društva, odnosno on je suvlasnik imovine preduzeća. Zbog toga prilikom ulaganja u akcije govorimo o investiciji u stvarne vrijednosti, nasuprot novčanim vrijednostima kod obveznica ili štednih uloga (Eling, 2013). Dakle, za razliku od obveznica i depozita, akcije nemaju rok dospijanja niti u pravilu imaju garantovan prinos, međutim, sa druge strane, potencijalna dobit investicije u akcije je neograničena. Ovo naročito važi za IPO, gdje je rizik ogroman, ali se i rast vrijednosti uspješnih akcija mjeri hiljadama procenata u periodu od samo desetak godina. Firme koje su stvorene u garažama, poput Microsofta i Amazona, donijele su bogatstva svojim prvim investitorima. Npr. kupac Microsoftove jedne akcije sa IPO 13. marta 1986, kojim se tada trgovalo po cijenama između 21 i 27 dolara, danas bi imao 288 akcija (zbog podjela akcija) tržišne vrijednosti početkom juna 2021. od 74.016 dolara, plus dividende koje se redovno isplaćuju još od 2003. Naravno, moramo podsjetiti i na velike gubitke investitora kada je pukao Dotcom balon, koji je donio milijarde gubitaka investitorima u nove high-tech kompanije poput Worldcoma, ili računovodstveni skandal sa kompanijom Enron.

Prednosti izlaska na berzu jednostavniji su vid dokapitalizacije. To je dobar način da privredno društvo koje hoće da se razvija bez zaduživanja stiče kapital za rast i razvoj. Troškovi „nabavke novca“ najviše utiču na odluku da se vlasnik kojem je neophodan kapital odluči za banku umjesto za inicijalnu ponudu akcija. Međutim, postoje i benefiti kao što su iskustvo, vrijeme i pažnja članova predstavnika akcionara u organima listiranog društva. Osim toga, da bi izašla na berzu i pribavila novac, privredna društva treba da skrenu pažnju na sebe, promoviraju se, otvore se za javnost i još da dobiju nove vlasnike. Sve to traje i košta, ali šalje sliku o stvarnom stanju u privrednom društvu u javnost. Sa druge strane, kreditno zaduživanje jeste kraće, ne zahtijeva veliku transparentnost, a nema upliva novih vlasnika. Dakle, nema ni podjele vlasništva.

Predmet rada odnosi se na analizu efekata inicijalne javne ponude. Cilj rada je analizirati sve relevantne faktore koji utiču na rezultat inicijalne javne ponude akcija, identifikovati motive zbog kojih se društva odlučuju na IPO, ali i analizirati motive i efekte procesa delistiranja društva sa berze. U istraživanju su korištene metode analize, sinteze, dedukcije, kao i odabrani alati poslovne i finansijske analize. Primarno su korišteni sekundarni izvori podataka, poput naučne i stručne literature, te javno dostupnih statističkih baza

podataka. Osim toga, u radu se ispituje veza između broja listiranih akcionarskih društava u zemlji, BDP-a *per capita*, broja stanovnika, tržišne kapitalizacije i indeksa razvoja finansijskog tržišta.

## 1. METODOLOGIJA

U istraživanju su korištene metode analize, sinteze, dedukcije, kao i komparacija javno dostupnih podataka o broju listiranih akcionarskih društava, BDP-u *per capita*, broju stanovnika, tržišnoj kapitalizaciji i indeksu razvoja finansijskog tržišta za zemlje OECD-a i nerazvijene zemlje. U istraživanju se posmatraju podaci koje je publikovao provajder The global economy (2020) i Međunarodni monetarni fond (2020). Dakle, za svaku posmatranu zemlju uzeti su u obzir broj listiranih akcionarskih društava i regresionom analizom istraživanja je jačina veze sa određenim parametrom.

Veza posmatranih pokazatelja odnosno varijabli može se provjeravati na više načina. Linearna regresija korištena je jer se pošlo od pretpostavke da postoji linearni odnos između nezavisne varijable (X) i zavisne varijable (Y). Hipoteze su postavljene kao:

H0 – nul-hipoteza = negacijska hipoteza („pojava X nije u vezi sa pojavom Y“),

H1 – alternativna = afirmacijska.

S tim u vezi, istraživačko pitanje postavljeno je na način da li pojava X utiče na pojavu Y. Prema tome, hipoteze su:

H01: Broj listiranih preduzeća nije u vezi sa BDP-om *per capita*.

H02: Broj listiranih preduzeća nije u vezi sa brojem stanovnika.

H03: Broj listiranih preduzeća nije u vezi sa tržišnom kapitalizacijom.

H04: Broj listiranih preduzeća nije u vezi sa na FD indeksom.

## 2. PREGLED LITERATURE I POZADINA ISTRAŽIVANJA

Razne studije naglašavaju važnost finansiranja vlasnika u istraživanje i razvoj (Carpenter i Petersen, 2002a; Hall, 2002; Colombo i Grilli, 2007). U literaturi se često tvrdi da upravo start-up kompanije imaju značajnu ulogu u ekonomskom rastu (npr. Audretsch, 1995; Audretsch i Acs, 2003). Pojava start-up kompanija koje ostvaruju brzi rast – koje se ponekad nazivaju „gazelama“ – bila je u fokusu mnogih rasprava o javnoj politici jer su takve kompanije ključni doprinos budućem ekonomskom rastu (npr. Henrekson i Johansson, 2010; Koski i Pajarinen, 2013). Nije iznenađujuće što mlade IPO kompanije nadmašuju druge u velikoj mjeri i očekuje se da će podstaći ekonomski rast inovacijama i otvaranjem novih radnih mjesta. Ta privredna društva takođe mogu osigurati akcionarima u ranoj fazi visoku kapitalnu dobit izlaskom na tržište, što često privlači ulagače sklone riziku. Prema tome, izlazak na berzu je postalo jedno od najkritičnijih pitanja, posebno u stagnirajućim ekonomijama. Uprkos tome, malo pažnje se posvećuje efektima i rezultatima izlaska na berzu.

Mlada i inovativna privredna društva po prirodi stvari imaju jači podsticaj za inovacije od postojećih, starijih kompanija (Honjo, 2020). Takva privredna društva igraju ključnu ulogu u podsticanju inovacija kao sredstva za prenos i kapitalizaciju znanja (Audretsch i sar., 2008; Colombo i sar., 2016; Block i sar., 2018). Kako bi promovisali pojavu mladih i inovativnih privrednih društava s potencijalom za rast, kreatori politika i donosioci odluka u razvijenim

## INTRODUCTION

The initial public offering of shares (IPO) is not a phase that all companies reach, but it is a critical phase in the process of growth and development of a company. Although some entrepreneurs are actively seeking access to public stock markets through IPOs, most companies remain privately owned. It is not easy for companies that start a business to enter the market in a short period of time. Nevertheless, high-tech companies with insecure jobs - for example, launching biotechnology for discovery of medicines - often seek access to public stock markets through IPOs despite a lack of business history and business records.

The idea of issuing shares is probably so old that it is not possible to date it. It is known that shares (lat. Partes) in companies (lat. Publicani) were traded near the temple of Castor in the ancient Roman forum (Shiler 2015). Shareholding gained new momentum in Renaissance Italy, and the first regulated stock market became Amsterdam in the 17th century. According to Schiller, the basis of the concept has always been “free association and stock trading that results in an imaginative use of capital for new ideas and new business guidelines. Although most of these ideas fail, some will succeed and bring economic development to society as a whole, and above-average returns to their shareholders.

Shares are documents that confirm in writing the amount of the shareholder's share in the property of a joint stock company, ie he is a co-owner of the company's property. Therefore, when investing in stocks, we are talking about investing in real values, as opposed to monetary values in bonds or savings deposits (Eling 2013). Thus, unlike bonds and deposits, shares do not have a maturity nor, as a rule, have a guaranteed return, but on the other hand, the potential profit of investing in shares is unlimited. This is especially true for IPOs where the risk is huge but the growth in the value of successful stocks is measured in thousands of estimates over a period of just ten years. Firms created in garages like Microsoft and Amazon brought wealth to their first investors. For example, the buyer of Microsoft's 1 share with an IPO on March 13. 1986 which was then traded at prices between 21 and 27 dollars today would have 288 shares (due to the division of shares) with a market value in early June 2021 of 74016 dollars plus dividends that have been paid regularly since 2003. Of course we must recall the large losses of investors burst a Dotcom bubble that brought billions of losses to investors in new high tech companies like Worldcom or an accounting scandal with Enron.

The advantages of going public are a simpler form of recapitalization. It is a good way for a company that wants to develop without borrowing to acquire capital for growth and development. The cost of “purchasing money” mostly influences on the decision where the owner who needs the capital decides for a bank instead of the initial offering of shares. However, there are also benefits such as the experience, time and attention of the members of the shareholders' representatives in the bodies of the listed company. In addition, in order to go public and raise money, companies need to draw attention to themselves, to promote themselves, to open up to the public and still get new owners. All this lasts and costs, but it sends a picture of the real situation in the company to the public. On the other hand, loan borrowing is shorter, it does not require great transparency and there is no inflow of new owners. Therefore, there is no division of property either.

The subject of the paper refers to the analysis of the effects of the initial public offering. The aim of this paper is to analyze all relevant factors that affect the result of the initial public offering of shares, to identify the motives for which companies decide on the IPO, but also to analyze the motives and effects of the process of delisting

the company from the stock exchange. The methods of analysis, synthesis, deduction as well as selected tools of business and financial analysis were used in the research. Primarily, the secondary data sources were used, such as scientific and professional literature, and publicly available statistical databases. In addition, the paper examines the correlation between the number of listed joint stock companies in the country, GDP per capita, population, market capitalization and financial market development index.

## 1. METHODOLOGY

The research used methods of analysis, synthesis, deduction and comparison of publicly available data on the number of listed joint stock companies and GDP per capita, population, market capitalization and financial market development index for OECD countries and underdeveloped countries. The research observes data published by the provider The Global Economy (2020) and the International Monetary Fund (2020). Therefore, for each observed country, the number of listed joint stock companies was taken into account and the strength of the correlation with a certain parameter was investigated by regression analysis.

The correlation of the observed indicators or variables can be checked in several ways. Linear regression was used because it was assumed that there was a linear correlation between the independent variable (X) and the dependent variable (Y). Hypotheses are set as following:

H0 – null hypothesis = negative hypothesis (“phenomenon X is not related to phenomenon Y”)

H1 – alternative hypothesis = affirmative hypothesis

In this regard, the research question was asked whether the phenomenon X affects the phenomenon Y. Therefore, the hypotheses are as following:

H01: The number of listed companies is not related to GDP per capita.

H02: The number of listed companies is not related to the number of inhabitants.

H03: The number of listed companies is not related to market capitalization.

H04: The number of listed companies is not related to the FD Index.

## 2. LITERATURE REVIEW AND RESEARCH BACKGROUND

Various studies emphasize the importance of owner's financing for research and development (Carpenter and Petersen 2002a; Hall 2002; Colombo and Grilli 2007). It is often argued in the literature that startups play a significant role in economic growth (e.g. Audretsch 1995; Audretsch and Acs 2003). The emergence of fast-growing startups - sometimes referred to as “gazelles” - has been the focus of many public policy debates as such companies are a key contributor to future economic growth (e.g. Henrekson and Johansson 2010; Koski and Pajarinen 2013). It is not surprising that young IPO companies outperform others to a large extent and are expected to drive economic growth through innovation and job creation. These companies can also provide early-stage shareholders with high capital gains by entering the market, which often attracts risk-loving investors. Therefore, going public on the stock exchange has become one of the most critical issues, especially in



zemljama fokusirali su se na to kako te kompanije osiguravaju finansiranje za rizične R&D projekte (Block et al., 2018). Ne iznenađuje da start-up kompanije ne dobijaju uvijek potrebna sredstva pri osnivanju, čak i ako im je potrebno ulaganje da bi tek održale poslovanje. Ta privredna društva se ponekad susreću sa značajnim ograničenjima na polju finansiranja. Na primjer, vanjski dobavljači kapitala, poput banaka, imaju manje informacija o projektima takvih kompanija, za razliku od samih vlasnika, a takve je informacije skupo dobiti (Binks i sar., 1992; Binks i Ennew, 1996). Neizvjesnost i informaciona asimetrija između preduzetnika i vanjskih dobavljača kapitala teže su za privredna društva koja se pokreću upravo zbog nedostatka poslovne istorije i dosadašnjih evidencija (Honjo i sar., 2014). Takva neizvjesnost i asimetrija informacija onemogućavaju privredna društva koja započinju s radom da dobiju kredite. Naime, trošak kapitala se povećava s asimetrijom informacija, uz neizvjesnost u poslovnim izgledima (Honjo, 2020).

Prethodne studije naglašavale su moralni rizik i probleme selekcije usljed informacione asimetrije. Navedene anomalije otežavaju vanjsko finansiranje visokorizičnih privrednih društava, uključujući i novoosnovana privredna društva (npr. Arrow, 1962; Himmelberg i Petersen, 1994; Carpenter i Petersen, 2002a). Banke nerado posuđuju novac novoosnovanim preduzećima, prije svega zbog poteškoća u procjeni novih poduzeća i tehnologija. Povratak projekata istraživanja i razvoja vrlo je neizvjestan i njihov kvalitet je teško procijeniti (Müller i Zimmermann, 2009). Ulaganja u istraživanje i razvoj imaju veću vjerovatnost da postanu gubitak, a takve kompanije imaju malo materijalne imovine koja bi osigurala dovoljno kolaterala (Kamien i Schwartz, 1978; Carpenter i Petersen, 2002b; Hall, 2002). Dakle, novoosnovane kompanije će se suočiti s većim troškovima koji proizlaze upravo iz nesigurnosti i asimetrije informacija zbog poteškoća u procjeni novih firmi i tehnologija (Honjo i sar., 2014). Te kompanije će se suočiti sa finansijskim ograničenjima za ulaganja u istraživanje i razvoj jer nisu akumulirale dobit ili stalni novčani tok od svojih projekata istraživanja i razvoja (Czarnitzki i Hottenrott, 2011).

IPO se smatra fazom u procesu rasta, ali odluka da se izađe na tržište je kompleksna (Pagano i sar., 1998). Razne studije isticale su koristi od izlaska na tržište: diverzifikacija, mogućnost finansiranja vlasničkim udjelima izvan ograničenog bogatstva preduzetnika, jeftiniji pristup tržištu kapitala, poboljšani imidž i publicitet privrednog društva te motivisanje menadžmenta i zaposlenih (Zingales, 1995; Röell, 1996; Pagano i sar., 1998). Ritter i Welch (2002) analizirali su efekte inicijalne javne ponude. S gledišta privrednog društva, odluka da izađu na tržište zavisi od kompromisa između njihovih koristi i troškova izlaska na berzu. Dakle, privredna društva imaju podsticaj da se listiraju na berzu ako su očekivane neto koristi od toga veće od očekivanih neto koristi od ostajanja u statusu društva sa ograničenom odgovornošću ili zatvorenog akcionarskog društva.

Razne studije na osnovu podataka o evropskim i američkim privrednim društvima pokazuju da karakteristike privrednih društava, poput veličine i starosti, utiču na odluku o listiranju na berzu (npr. Pagano i sar., 1998; Chemmanur i sar., 2010; Aslan i Kumar, 2011; De Jong i dr., 2012; Cattaneo i sar., 2015). Međutim, iako su Ritter i Welch (2002) napravili podjelu o životnom ciklusu kompanije, malo je istraživanja fokusirano na inicijalnu ponudu akcija kao fazu u procesu rasta privrednog društva. Iako su određene studije dale određene dokaze o rezultatima i efektima inicijalne ponude akcija, njihovi rezultati su možda posljedica fokusa na privredna društva koja su uspješno izašla na berzu. Osim toga, privredna društva koja su u privatnom vlasništvu duže vrijeme su uključena u uzorak, dok su mlada i mala privredna društva obično isključena jer je veća vjerovatnoća da će ona nestati zbog bankrota ili likvidacije u prvim fazama postojanja. Honjo (2020) ističe da najviše pažnje treba posvetiti odluci o inicijalnoj javnoj ponudi mladih umjesto starijih privrednih društava. Još preciznije, za IPO će se radije odlučiti privredno društvo koje je nastalo kao start-up privredno društvo s potencijalom za rast. Međutim,

uprkos važnosti mladih firmi u jačanju ekonomskog rasta, malo je studija ispitivalo IPO novoosnovanih privrednih društava.

Nalazi teorijskih modela privrednog rasta zasnivaju se na implicitnoj pretpostavci o tome da su ekonomske institucije identične u svim slučajevima, odnosno svim zemljama (Begović, 2011). U stvarnosti to nije ni blizu tačno i postoji čitav spektar institucionalnih okvira koji mogu djelovati inspirativno ili pak inhibirajuće na preduzetnike i njihove aktivnosti. Od posljednje decenije prošlog vijeka neke su države, poput Kanade, evropskih zemalja i Japana, uvele nova tržišta akcija (juniorska tržišta akcija) nakon Nacionalnog udruženja automatizovanih kotacija trgovaca hartijama od vrijednosti (NASDAQ) u SAD. Cilj je bio upravo da se obezbijedi kapital za finansiranje mladih kompanija s potencijalom za rast. S ciljem da bi se malim i visokotehnološkim kompanijama omogućilo da izađu na tržište bez borbe sa prekomjernim propisima, neke berze su pokrenule sekundarna i neregulirana tržišta u Evropi (Vismara i sar., 2012). Na primjer, tržište alternativnih ulaganja (AIM) (Ujedinjeno Kraljevstvo), Neuer Markt (Njemačka), Nouveau Marché (Francuska) i Nuovo Mercato (Italija) pokrenuti su u posljednjoj deceniji prošlog vijeka. Kako su zahtjevi za uvrštavanjem na uspostavljene berze bili strogi za mlade i male kompanije, ta su tržišta akcija osmišljena tako da udovolje potrebama malih kompanija (Ritter i sar., 2013). Nakon ovog talasa nastaju razni fondovi i biznis anđeli specijalizovani za ulaganje s ciljem podsticanja rasta i razvoja perspektivnih kompanija.

Zbog manje strogih zahtjeva za uvrštavanjem na tržište, inicijalne javne ponude akcija na četiri razvijena tržišta – u Francuskoj, Njemačkoj, Italiji i Velikoj Britaniji (Vismara i sar., 2012) činile su najveći dio broja svih inicijalnih javnih ponuda na svijetu od 1995. do 2009. Međutim, uprkos očekivanju povećanja broja inicijalnih javnih ponuda, njihov broj se smanjio tokom i nakon 2008. godine u evropskim zemljama (Vismara et al., 2012; Ritter et al., 2013; Akyol et al., 2014). Zanimljivo je zapaziti i oprečne stavove o IPO malih kompanija. Gao i saradnici (2013) sugerišu da male kompanije gube koristi od izlaska na berzu i obratno – traže strateška preuzimanja kao alternativu izlasku na berzu.

Procesu listiranja akcija prethodi objava prospekta. Priprema i objava ovog dokumenta predstavlja pružanje informacija o emitentu. Struktura i sadržaj prospekta precizno su pravno regulisani u Evropskoj uniji. Takođe, da bi se podstaklo kompletno i pouzdano sastavljanje prospekata, postoji i poseban režim odgovornosti za sadržaj takvih dokumenata. On ima slična obilježja u razvijenim ekonomijama, kao što su Evropska unija i Sjedinjene Američke Države. Na kraju, sprovođenjem složene, tzv. due diligence provjere (provjere boniteta privrednog društva), može se zaključiti o pouzdanosti i cjelovitosti objavljenih informacija, čime se može ublažiti ili izbjeći pravni rizik (Kecskés, Halász, 2015).

Argument za izlazak na berzu jesu zbirna iskustva na razvijenim tržištima kapitala koja pokazuju da se „nakon prelaska u otvoreno akcionarsko društvo organizaciono disciplinuje” (Von Eije, De Witte, Van der Zwan, 2004). Dolazi do razdvajanja vlasničke i upravljačke funkcije, a osim interne revizije, obavezna je i eksterna revizija. Menadžeri koji rukovode akcionarskim društvom se putem menadžerskih ugovora motivišu da upravljaju privrednim društvom u najboljem interesu svih akcionara. Uz to, u otvorenom akcionarskom društvu svi vlasnici, srazmjerno svom učešću u kapitalu, učestvuju u procesu donošenja važnijih odluka (Dai, Tan, Tang, Xiao, 2017).

## 2.1. (De)listiranje na malim berzama

Promet na Banjalučkoj berzi prošle godine iznosio je 734,02 miliona maraka. Najveći dio, 621,39 miliona maraka ili 84,66 odsto od ukupnog prometa, odnosi se na promet dužničkim hartijama od vrijednosti. Gotovo pola ostvarenog prometa, odnosno 365,69 miliona maraka, odnosi se na promet obveznicama, a 255,70 miliona ili 35% na promet trezorskim zapisima. Ostatak od 112,62 mili-

stagnant economies. Despite that, little attention is paid to the effects and results of going public on the stock exchange.

Young and innovative companies, by the nature of things, have a stronger incentive for innovation than existing, older companies (Honjo, 2020). Such companies play a key role in fostering innovation as a means transfer and capitalization of knowledge (Audretsch et al. 2008; Colombo et al. 2016; Block et al. 2018). To promote the emergence of young and innovative companies with growth potential, policymakers and decision makers in developed countries focused on how these companies secure financing for risky R&D projects (Block et al., 2018). It is not surprising that startup companies do not always receive the necessary funds when establishing, even if they need an investment in order to maintain their business. These companies sometimes face significant financial constraints. For example, external capital suppliers, such as banks, have less information about the projects of such companies than the owners themselves, and such information is expensive to obtain (Binks et al. 1992; Binks and Ennew 1996). Uncertainty and information asymmetry between entrepreneurs and external capital suppliers are more difficult for companies that are starting their operations precisely because of the lack of business history and previous records (Honjo et al. 2014). Such uncertainty and asymmetry of information make it impossible for companies that start operating to obtain loans. Namely, the cost of capital increases with the asymmetry of information, along with uncertainty in the business outlook (Honjo, 2020).

Previous studies have emphasized that moral hazard and adverse selection occur due to information asymmetry. These anomalies make external financing difficult for high-risk companies, including newly established companies (e.g., Arrow 1962; Himmelberg and Petersen 1994; Carpenter and Petersen 2002a). Banks are reluctant to lend money to startups, primarily because of difficulties in evaluating new businesses and technologies. The return of research and development projects is very uncertain and their quality is difficult to assess (Müller and Zimmermann 2009). Investments in research and development are more likely to become a loss, and such companies have few tangible assets that would provide sufficient collateral (Kamien and Schwartz 1978; Carpenter and Petersen 2002b; Hall 2002). Therefore, newly established companies will face higher costs arising precisely from the uncertainty and asymmetry of information due to difficulties in evaluating new firms and technologies (Honjo et al. 2014). These companies face financial constraints on research and development investment because they have not accumulated profits or steady cash flow from their research and development projects (Czarnitzki and Hottenrott 2011).

The IPO is considered a stage in the growth process, but the decision to enter the market is complex (Pagano et al. 1998). Various studies have highlighted the benefits of going to the market: diversification, the possibility of equity financing beyond the limited wealth of entrepreneurs, cheaper access to the capital market, improved company image and publicity, and motivating management and employees (Zingales 1995; Röell 1996; Pagano et al. 1998). Ritter and Welch (2002) analyzed the effects of the initial public offering. From the point of view of a company, the decision to go to the market depends on a compromise between their benefits and the costs of going public. Therefore, companies have an incentive to be listed on the stock exchange if the expected net benefits are greater than the expected net benefits from remaining in the status of a limited liability company or a closed joint stock company.

Various studies based on data on European and American companies show that the characteristics of companies, such as size and

age, influence the decision to list on the stock exchange (e.g. Pagano et al. 1998; Chemmanur et al. 2010; Aslan and Kumar 2011; De Jong et al. 2012; Cattaneo et al. 2015). However, although Ritter and Welch (2002) made a division on the life cycle of a company, few researches have focused on the initial offering of shares as a stage in the process of business growth. Although certain studies have provided certain evidences of the results and effects of the initial public offering, their results may be a consequence of a focus on companies that have successfully went public. In addition, privately owned companies have been included in the sample for a long time, while young and small companies are usually excluded because they are more likely to disappear due to bankruptcy or liquidation in the early stages of existence. Honjo (2020) points out that the biggest attention should be paid to the decision on the initial public offering of younger, instead of older, companies. More precisely, the IPO will be chosen by a company that emerged as a startup company with growth potential. However, despite the importance of young firms in boosting economic growth, few studies have examined the IPOs of newly established companies.

The findings of theoretical models of economic growth are based on the implicit assumption that economic institutions are identical in all cases, ie in all countries (Begović 2011). In reality, this is not even close to true and there is a whole range of institutional frameworks that can have an inspiring or inhibitory effect on entrepreneurs and their activities. Since the last decade of the last century, some countries, such as Canada, European countries and Japan, have introduced new stock markets (junior stock markets) after the National Association of Securities Dealers Automated Quotations (NASDAQ) in the United States. The goal was to provide capital to finance young companies with potential for growth. In order to enable small and high-tech companies to enter the market without combating excessive regulations, some stock exchanges have launched secondary and unregulated markets in Europe (Vismara et al. 2012). For example, the Alternative Investment Market (AIM) (United Kingdom), Neuer Markt (Germany), Nouveau Marché (France) and Nuovo Mercato (Italy) were launched in the last decade of the last century. As the requirements for listing on established stock exchanges were strict for young and small companies, these stock markets were designed to meet the needs of small companies (Ritter et al. 2013). After this wave, various funds and business angels were created that are specialized for investment with the aim of encouraging the growth and development of promising companies.

Due to less stringent market listing requirements, initial public offerings of shares in four developed markets - France, Germany, Italy and the United Kingdom (Vismara et al. 2012) accounted for the largest share of all initial public offerings in the world from 1995 to 2009. However, despite the expectation of an increase in the number of initial public offerings, their number decreased during and after 2008 in European countries (Vismara, et al., 2012; Ritter et al. 2013; Akyol et al. 2014). It is interesting to note the conflicting views on the IPOs of small companies. Gao et al. (2013) suggest that small companies lose benefits from going public and vice versa - requesting strategic and takeovers as an alternative to going public.

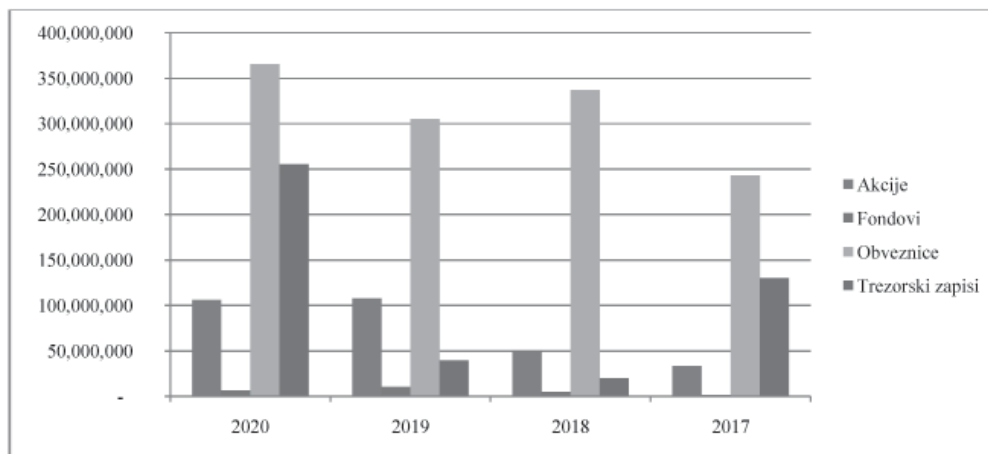
The process of listing shares is preceded by the publication of a prospectus. The preparation and publication of this document presents the provision of information about the issuer. The structure and content of the prospectus are precisely and legally regulated in the European Union. Also, in order to encourage complete



ona maraka ili 15,34% predstavlja promet akcijama i fondovima (106,14 i 6,48 miliona). Godinama je slična struktura prometa. Pro-

met dužničkim hartijama od vrijednosti, gotovo po pravilu, svake godine prelazi 75% od ukupnog prometa (ilustracija 1).

**Ilustracija 1.** Prikaz strukture prometa na Banjalučkoj berzi



Izvor: prikaz autora

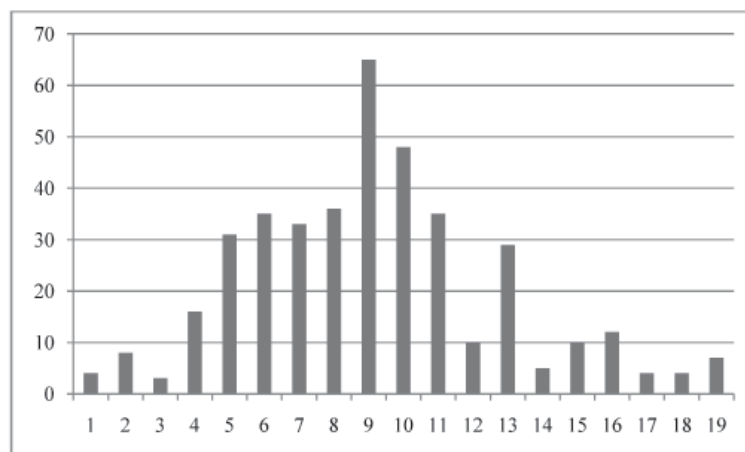
Po ovim podacima može se reći da su uočljivi trendovi koji ukazuju na dalji razvoj tržišta kapitala. Najinteresantniji je smanjen interes za ulaganje u akcije. Smanjen interes za akcije nije „od juče“. Prisutan je već deceniju. Na primjer, samo u posljednje četiri godine promet akcijama nije ni blizu četvrtine ukupnog prometa na Berzi. Posebno treba istaći, a što je i logično, manje zanimanje za ulaganje u akcionarska društva u kojima jedan ili manji broj vlasnika posjeduje većinski paket akcija. Manjinski akcionari u društvima sa ovakvom vlasničkom strukturom (s pravom) strahuju da će jednog dana, i to u skladu sa Zakonom o privrednim društvima, biti „istisnuti“ po trenutnoj tržišnoj cijeni po akciji. S obzirom na male promete i niske cijene, akcionari koji su isplaćeni na ovaj način stiču utisak da su isplaćeni po nefer cijeni. U proteklom periodu, iz određenog broja akcionarskih društava „istisnuti“ su mali akcionari odlukom većinskih vlasnika, koji su to uradili zahvaljujući sticanju 90 odsto akcija od strane jednog akcionara ili grupe povezanih akcionara. Drugi način objedinjavanja vlasništva i napuštanja Berze je da se broj akcionara smanji na manje od sto. Nakon ovih poteza, većinski vlasnik može da promijeni pravnu formu preduzeća u zatvoreno akcionarsko ili društvo sa ograničenom odgovornošću i da „skine“ društvo sa Berze. Na kraju, po istom zakonu, akcionar koji stekne akcije društva koje predstavljaju najmanje 90% osnovnog kapitala društva dužan je da na pisani zahtjev bilo kog od preostalih akcionara društva, u roku od 30 dana po prijemu zahtjeva, ponudi akcionaru primjerenu novčanu naknadu za akcije pojedinog manjinskog

akcionara. Do sada su sa Banjalučke berze delistirana 394 akcionarska društva. Od tog broja, 222 su imala oznaku „u stečaju“, a sedam „u likvidaciji“. Razloge ovakvog stanja treba prije svega tražiti u dva uzroka, i to:

Način „listiranja“ nije posljedica postepenog razvoja tržišta niti posljedica Kejnsovog „spontanog podstreka“, već je rezultat masovne vaučerske privatizacije. Suština vaučerske privatizacije zasniva se na tome da se građanima besplatno podijele vaučeri kojima oni kupuju akcije preduzeća, a sve s ciljem da se u što kraćem roku privatizuje što je moguće više privrednih društava. Vjerovalo se da privatizacija podjelom vaučera prevazilazi probleme koji nastaju procjenom kao kod ostalih modela privatizacije (Grujić, Janjić, 2021). Informaciona asimetrija, slaba finansijska pismenost, odsustvo korporativne kulture neumitno su vodili ka smanjenju broja listiranih preduzeća na Banjalučkoj berzi.

Zemlje se međusobno razlikuju po stepenu razvoja ekonomskih institucija, a stepen institucionalnih razlika objašnjava velike disparitete u dostignutom stepenu razvijenosti mjereno dohotkom *per capita* (Hall i Jones, 1999). Nažalost, ni dvije decenije od privatizacije i nominalnog prelaska na tržišni model privređivanja nije bilo dovoljno da se razvije duboko organizovano finansijsko tržište u kome, zahvaljujući niskim transakcionim troškovima, suficitni subjekti investiraju u vlasničke HOV.

**Ilustracija 2.** Prikaz broja delistiranih akcionarskih društava na Banjalučkoj berzi po godinama



Izvor: kalkulacija autora

and reliable compilation of prospectuses, there is a special regime of responsibility for the content of such documents. It has similar characteristics in developed economies, such as the European Union and the United States of America. In the end, by implementing a complex, so-called due diligence investigation (the investigation of the creditworthiness of a company), it is possible to conclude on the reliability and completeness of the published information, which can mitigate or avoid legal risk. (Kecskés & Halász, 2015).

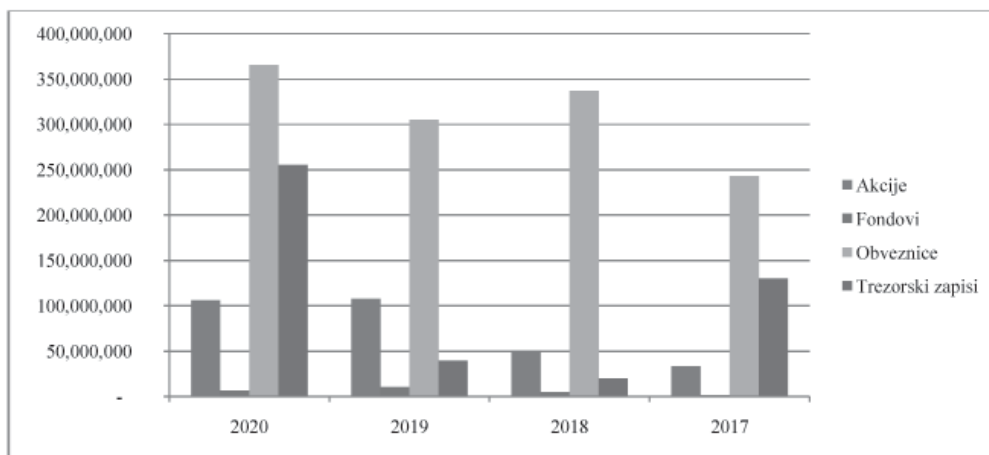
The argument for going public is the cumulative experience in developed capital markets, which shows that “after the transition to an open joint stock company, it gets organizational discipline” (von Eije, de Witte, van der Zwaan, 2004). There is a separation of ownership and management functions, and in addition to internal audit, external audit is also required. Managers who manage a joint stock company are motivated through managerial contracts to manage the company in the best interest of all shareholders. In addition,

in an open joint stock company, all owners, in proportion to their share in the capital, participate in the process of making important decisions. (Dai, Tan, Tang, & Xiao, 2017).

## 2.1. (De)listing on small stock exchanges

The turnover on the Banja Luka Stock Exchange last year amounted to 734.02 million convertible marks (BAM). The largest part, 621.39 million convertible marks, or 84.66 percent of the total turnover, refers to the trade in debt securities. Almost half of the realized turnover, i.e. 365.69 million convertible marks refers to the turnover of bonds and 255.70 million or 35% to the turnover of treasury bills. The remaining 112.62 million convertible marks or 15.34% represents the turnover of shares and funds (106.14 and 6.48 million). The trade structure has been similar for years. Debt securities turnover, almost as a rule, exceeds 75% of the total turnover every year (Figure 1).

**Figure 1:** Overview of the structure of turnover on the Banja Luka Stock Exchange



Source: Author's review

According to these data, it can be said that there are noticeable trends that indicate further development of the capital market. Reduced interest in investing in stocks is the most interesting. Decreased interest in shares is not “as of yesterday”. It has been present for a decade. For example, just in the last four years, stock trading has not even come close to a quarter of the total stock market turnover. What should be especially emphasized, which is logical, is the lower interest in investing in joint stock companies in which one or a smaller number of owners own a majority package of shares. Minority shareholders in companies with such an ownership structure (rightfully) fear that one day, in accordance with the Company Law, they will be “squeezed out” at the current market price per share. Given the small turnover and low prices, shareholders who are paid in this way get the impression that they were paid at an unfair price. In the past period, small shareholders were “squeezed out” from a certain number of joint stock companies by the decision of the majority owners, who did so thanks to the acquisition of 90 percent of shares by one shareholder or a group of related shareholders. Another way to consolidate ownership and leave the stock market is to reduce the number of shareholders to less than a hundred. After these moves, the majority owner can change the legal form of the company into a closed joint stock company or limited liability company and “take off” the company from the stock exchange. Finally, according to the same law, a shareholder who acquires shares of the company representing at least 90% of the share capital of the company is obliged, at the written request of any of the remaining shareholders of the company, within 30 days of receipt of the request, to offer to a share-

holder an appropriate financial compensation for the shares of an individual minority shareholder. So far, 394 joint stock companies have been delisted from the Banja Luka Stock Exchange. Of that number, 222 were marked “in bankruptcy” and seven “in liquidation.” The reasons for this situation should be sought primarily in two causes:

1. The method of “listing” is not a consequence of the gradual development of the market nor a consequence of Keynes’s “spontaneous stimulus”, but is the result of mass voucher privatization. The essence of voucher privatization is based on the distribution of vouchers to citizens free of charge, by which citizens buy company shares, all with the aim of privatizing as many companies as possible in the shortest possible time. It was believed that privatization by distributing vouchers overcomes the problems that arise with the assessment as in other models of privatization (Grujić, Janjić 2021). Information asymmetry, weak financial literacy, and the absence of a corporate culture have inevitably led to a reduction in the number of companies listed on the Banja Luka Stock Exchange.

2. Countries differ in the degree of development of economic institutions and the degree of institutional differences explains the large disparities in the level of development achieved measured by per capita income (Hall and Jones 1999). Unfortunately, even two decades since privatization and the nominal transition to a market economy model have not been enough to develop a deeply organized financial market in which, thanks to low transaction costs, surplus entities invest in equity

Velikom broju vlasnika preduzeća status otvorenog akcionarskog društva predstavlja samo značajne troškove. Naime, vlasnici se odlučuju da smanje troškove zbog obavezne revizije, naknada Berzi, Centralnom registru, organizovanja godišnje skupštine akcionara skupštine i slično. Odluke u preduzećima u kojima je većinski vlasnik stekao dominantno učešće uglavnom se donose u skladu sa interesima, odnosno potrebama i željama većinskih vlasnika. Često manjinski akcionari, čak i kad imaju svoje predstavnike u organima takvih privrednih društava, budu preglasani. Tom logikom, i delistiranje ima smisla, pogotovo ako se ima u vidu da su na svim berzama u regiji preduzeća listirana silom zakona, odnosno kroz proces privatizacije. Stoga, bez namjere da zagovaramo ovaj trend, nije neracionalno očekivati da će se broj listiranih društava još smanjiti. Jednim dijelom kao rezultat uticaja zakonske regulative, a drugim dijelom – zbog troškova koje status listiranog društva nosi.

Za budućnost i razvoj tržišta kapitala najvažnije je da se istisnuti akcionari ne osjećaju prevarenima. Povjerenje je, uz dobre zakone i edukovane i časne učesnike, jedan od stubova tržišta kapitala. Dugoročno, edukovanje stanovništva u pravcu povećanja finansijske pismenosti i znanja o finansijskim tržištima imalo bi pozitivan uticaj na razvoj tržišta kapitala. Za razliku od zemalja u tranziciji, koje su „navrat-nanos” izvršile privatizaciju, razvijene zemlje godinama, osim zakonske zaštite, mnogo novca i pažnje odvajaju za obrazovanje svih učesnika na finansijskim tržištima. Obrazovaniji učesnici lakše prepoznaju (ne)prilike za ulaganje, što se pozitivno odražava i na povjerenje i na promete na Berzi.

S druge strane, postoji ozbiljniji razlog za brigu na domaćem tržištu. Privatna preduzeća (još) ne pokazuju interes da kroz inicijalne javne ponude izađu na berzu i tako dođu do novca. U jednu ruku, ni to ne treba da predstavlja iznenađenje. Praksa i iskustva na razvijenim tržištima kapitala pokazuju da manji broj listiranih društava ne znači nužno i manje razvijeno tržište kapitala. Na primjer, broj listiranih preduzeća na berzi u Budimpešti je 43 ili oko 4,45 na milion stanovnika. Broj listiranih preduzeća na berzi u Ljubljani je 31 ili oko 14,91 na milion stanovnika, na Zagrebačkoj berzi je 127 ili oko 30,94 na milion stanovnika, na Makedonskoj berzi je 100 ili

oko 47,87 na milion stanovnika, na Beogradskoj berzi je 429 ili oko 49,1 na milion stanovnika, na Sarajevskoj berzi je 315 ili oko 96,01 na milion stanovnika, na Banjalučkoj berzi je 541 ili oko 164,9 na milion stanovnika, na Crnogorskoj berzi je 390 ili oko 620,95 na milion stanovnika. S druge strane, na berzama u Zapadnoj Evropi nema mnogo listiranih preduzeća, a prometi su veći. Štaviše, trguje se sa više različitih finansijskih instrumenata.

### 3. REZULTATI

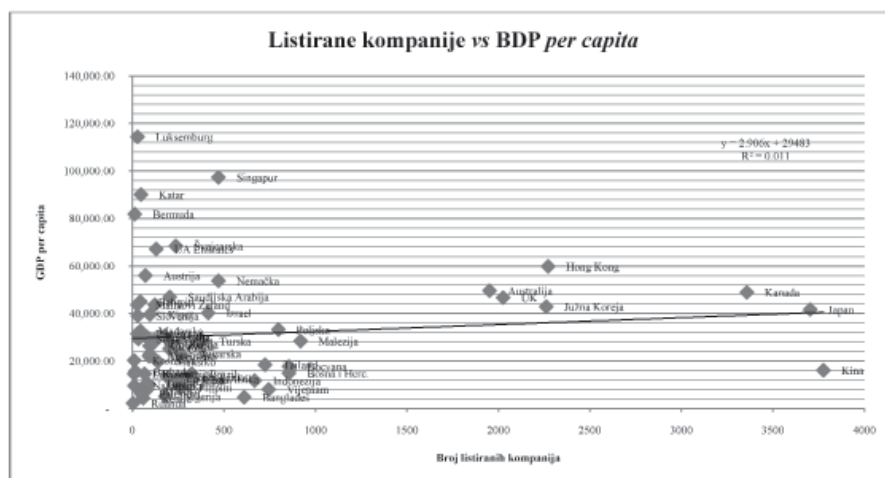
Analiza veze između broja listiranih preduzeća i BDP-a *per capita* na posmatranom uzorku pokazuje da je R kvadrat (R<sup>2</sup>) jednak 0,011415334 (tabela 1). To znači da nezavisna varijabla (varijabla X – broj listiranih kompanija) objašnjava 1,1% varijable Y – BDP *per capita*. Drugim riječima, broj listiranih kompanija utiče sa oko 1,1% BDP-a *per capita*. Koeficijent višestruke korelacije (R) jednak je 0,106842566, što znači da ne postoji direktna veza između nezavisne i zavisne varijable (ilustracija 3).

**Tabela 1.** Regresiona analiza podataka za nivo broj listiranih kompanija i BDP *per capita*

Multiple R	0,106842566
R Square	0,011415334
Adjusted R Square	-0,00452958
Standard Error	23672,76469
Observations	64
F	0,715923204
Significance F	0,400738349
F crit	1,812212225
Test	prihvatao

Izvor: kalkulacija autora

**Ilustracija 3.** Prikaz korelacije broja listiranih zemalja i BDP-a po glavi stanovnika



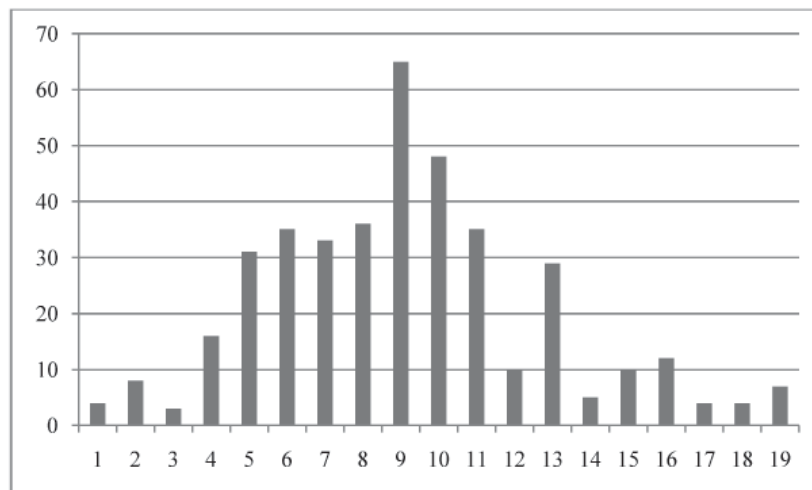
Izvor: prikaz autora

S obzirom na to da je p-vrijednost 0,400738349 veća od 0,05, sa sigurnošću od 95% može se prihvatiti hipoteza da „broj listiranih kompanija ne utiče na BDP *per capita*” te se može zaključiti da broj listiranih kompanija ne stoji u statistički značajnoj vezi sa BDP-om *per capita*.

Posmatrajući odnos broja listiranih kompanija i broja stanovnika, zapaža se da je R kvadrat (R<sup>2</sup>) jednak 0,257584801 (tabela 2). To znači da nezavisna varijabla (varijabla X – broj listiranih kompa-

nija) objašnjava 25,76% varijable Y – broj stanovnika. Koeficijent višestruke korelacije (R) jednak je 0,507528129, što znači slabu direktnu vezu između nezavisne i zavisne varijable (ilustracija 4). S obzirom na to da je p-vrijednost 0,0000187 značajno manja od 0,05, sa sigurnošću od 95% može se odbaciti hipoteza da broj listiranih kompanija ne utiče na broj stanovnika te se može zaključiti da broj listiranih kompanija stoji u slaboj vezi sa brojem stanovnika pod pretpostavkom nepromijenjenih ostalih varijabli.

**Figure 2:** Overview of the number of delisted joint stock companies on the Banja Luka Stock Exchange by year



Source: Author's calculation

For a large number of business owners, the status of an open joint stock company represents - only significant costs. Namely, the owners decide to reduce the costs due to the obligatory audit, the fees of the stock exchange, the Central Registry, the organization of the annual assembly of shareholders and similar. Decisions in companies in which the majority owner has acquired a dominant share are generally made in accordance with the interests i.e. needs and wishes of the majority owners. Often, minority shareholders, even when they have their representatives in the bodies of such companies, are outvoted. By that logic, delisting also makes sense. Especially if we keep in mind that on all stock exchanges in the region, companies are listed by force of law, i.e. through the privatization process. Therefore, without intention to advocate this trend, it is not irrational to expect that the number of listed companies will decrease even further. Partly as a result of the influence of legal regulations, and partly due to the costs that the status of a listed company bears.

The most important thing for the future and development of the capital market is that the “squeezed out” shareholders do not feel cheated. Trust is, along with good laws and educated and honourable participants, one of the pillars of the capital market. In the long run, educating the population in the direction of increasing financial literacy and knowledge of financial markets would have a positive impact on the development of capital markets. Unlike the countries in transition, which have “hastily” conducted their privatization, developed countries have been devoting a lot of money and attention to the education of all participants in the financial markets, in addition to legal protection. More educated participants find it easier to recognize investment opportunities (threats), which has a positive effect on both trust and stock market turnover.

On the other hand, there is a more serious reason for concern in the domestic market. Private companies do not (yet) show interest in going public through initial public offerings and making money in that way. On the one hand, that shouldn't come as a surprise either. Practice and experience in developed capital markets show that a smaller number of listed companies does not necessarily mean a less developed capital market. For example, the number of companies listed on the Budapest Stock Exchange is 43 or about 4.45 per million inhabitants. The number of listed companies on the Ljubljana Stock Exchange is 31 or about 14.91 per million inhabitants, on the Zagreb Stock Exchange it is 127 or about 30.94 per million inhabitants, on the Macedonian Stock Exchange it is 100 or about

47.87 per million inhabitants, on the Belgrade Stock Exchange it is 429 or about 49.1 per million inhabitants, on the Sarajevo Stock Exchange there are 315 or about 96.01 per million inhabitants, on the Banja Luka Stock Exchange there are 541 or about 164.9 per million inhabitants, on the Montenegrin Stock Exchange there are 390 or about 620.95 per million inhabitants. On the other hand, there are not many listed companies on the stock exchanges in Western Europe, and the turnover is higher. Moreover, higher number of different financial instruments are traded.

### 3. RESULTS

Analysis of the correlation between the number of listed companies and GDP per capita in the observed sample shows that R square (R<sup>2</sup>) is equal to 0.011415334 (Table 1). This means that the independent variable (variable X - number of listed companies) explains 1.1% of the variable Y - GDP per capita. In other words, the number of listed companies is affected by about 1.1% of GDP per capita. The multiple correlation coefficient (R) is equal to 0.106842566 which means that there is no direct correlation between the independent and dependent variable (Figure 1).

**Table 1:** Regression analysis of data for the level of number of listed companies and GDP per capita

Multiple R	0.106842566
R Square	0.011415334
Adjusted R Square	-0.00452958
Standard Error	23672.76469
Observations	64
F	0.715923204
Significance F	0.400738349
F crit	1.812212225
Test	we accept

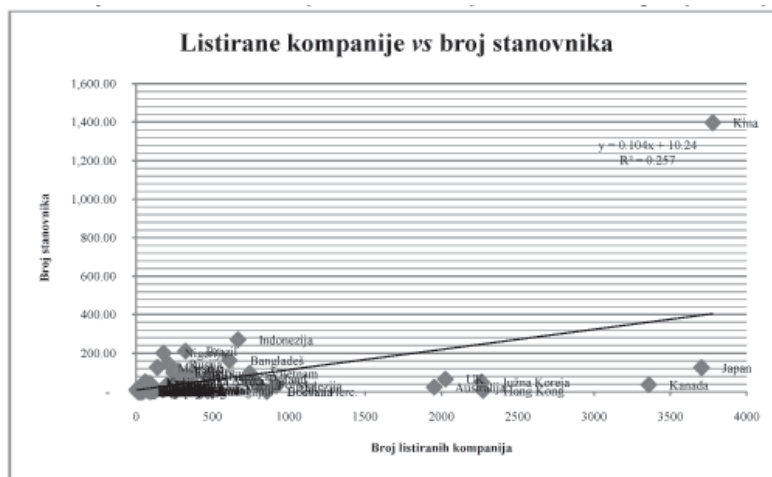
Source: Author's calculation



**Tabela 2.** Regresiona analiza podataka za nivo digitalizacije i HD indeksa za zemlje OECD-a

Multiple R	0,507528129
R Square	0,257584801
Adjusted R Square	0,245610363
Standard Error	155,4816358
Observations	64
F	21,51122137
Significance F	1,86554E-05
F crit	1,812212225
Test	odbacujemo

Izvor: kalkulacija autora

**Ilustracija 4.** Prikaz korelacije i determinacije listiranih kompanija i broja stanovnika

Izvor: kalkulacija autora

Kada se posmatra odnos listiranih kompanija po zemljama i tržišna kapitalizacija na berzama u odnosu na BDP, zapaža se da je R kvadrat (R2) jednak 0,06151026 (Error! Not a valid bookmark self-reference.). To znači da nezavisna varijabla (varijabla X – broj listiranih kompanija) objašnjava 6,15% varijable Y – tržišnu kapitalizaciju kao procenat BDP-a (ilustracija 5). Koeficijent višestruke korelacije (R) jednak je 0,24801262, što znači da postoji veoma

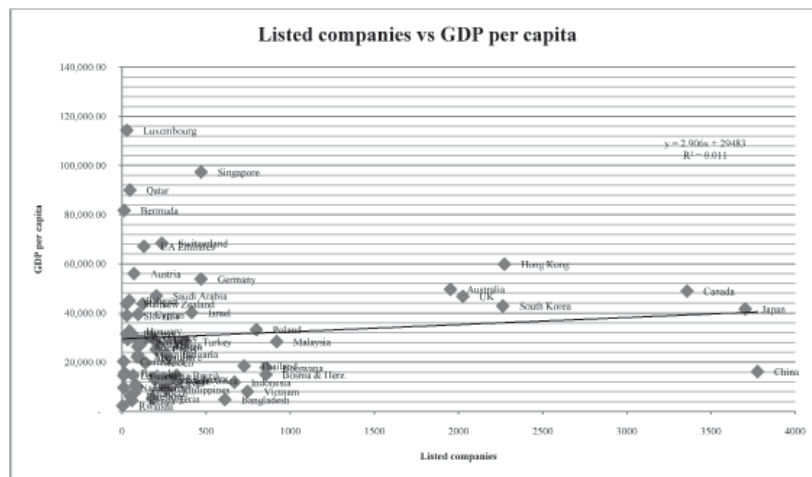
slaba direktna veza između nezavisne i zavisne varijable. S obzirom na to da je p-vrijednost 0,048156289 značajno manja od 0,05, sa sigurnošću od 95% ne može se odbaciti hipoteza da broj listiranih kompanija ne utiče na tržišnu kapitalizaciju u odnosu na BDP te se može zaključiti da broj listiranih kompanija stoji u slabijoj vezi sa brojem stanovnika pod pretpostavkom nepromijenjenih ostalih varijabli.

**Tabela 3.** Regresiona analiza podataka za broj listiranih kompanija i tržišnu kapitalizaciju kao procenat BDP-a

Multiple R	0,24801262
R Square	0,06151026
Adjusted R Square	0,046373328
Standard Error	169,0460981
Observations	64
F	4,063588488
Significance F	0,048156289
F crit	1,812212225
Test	prihvataemo

Izvor: kalkulacija autora

Figure 3: Overview of the correlation between the number of listed countries and GDP per capita



Source: Author's review

Given that the p value of 0.400738349 is greater than 0.05 with a certainty of 95%, the hypothesis that “the number of listed companies does not affect GDP per capita” can be accepted and it can be concluded that the number of listed companies does not stand in statistically significant correlation with GDP per capita.

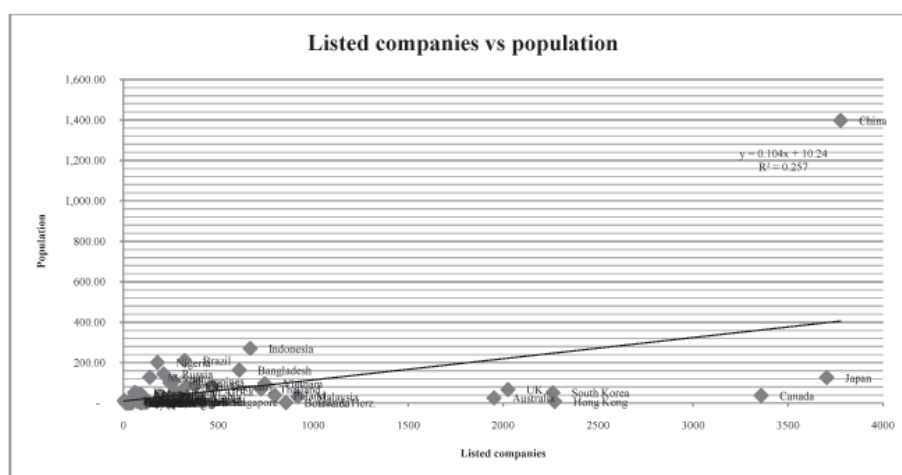
Observing the ratio of the number of listed companies to the number of inhabitants, it can be noticed that R square (R2) is equal to 0.257584801 (Table 2). This means that the independent variable (variable X - number of listed companies) explains 25.76% of the variable Y - population. The multiple correlation coefficient (R) is equal to 0.507528129 which means that there is a weak direct correlation between the independent and dependent variables (Figure 2). Given that the p value of 0.0000187 is significantly less than 0.05 with a certainty of 95%, we can reject the hypothesis that the number of listed companies does not affect the population and to conclude that the number of listed companies is weakly related to the number of inhabitants under the assumption that other variables are unchanged.

Table 2: Regression analysis of data for digitization level and HD index for OECD countries

Multiple R	0.507528129
R Square	0.257584801
Adjusted R Square	0.245610363
Standard Error	155.4816358
Observations	64
F	21.51122137
Significance F	1.86554E-05
F crit	1.812212225
Test	we reject

Source: Author's calculation

Figure 4: Review of correlation and determination of listed companies and population

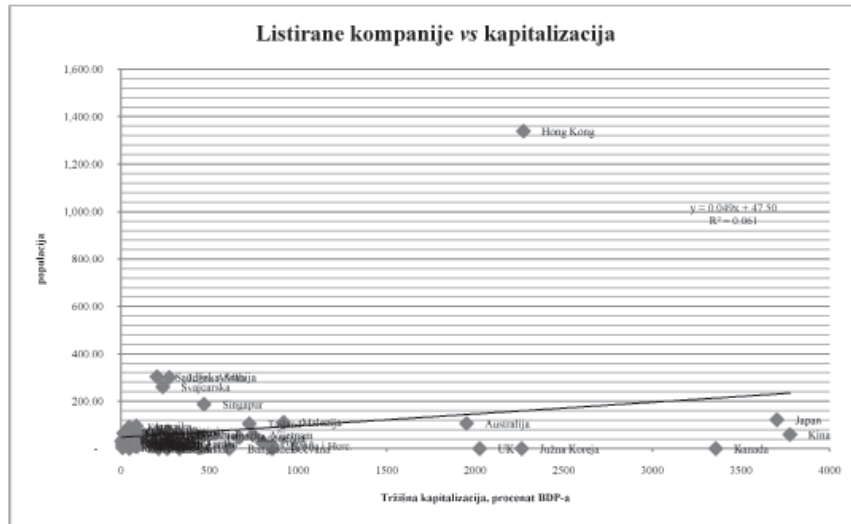


Source: Author's calculation

When observing the ratio of listed companies by countries and market capitalization on stock exchanges in relation to GDP, it can be noticed that R square (R2) is equal to 0.06151026 (Table 3). This means that the independent variable (variable X - number of listed companies) explains 6.15% of the variable Y - market capitalization as a percentage of GDP (Figure 3). The multiple correlation coefficient (R) is equal to 0.24801262 which means that there is a weak

direct correlation between the independent and dependent variable. Given that the p value of 0.048156289 is significantly lower than 0.05 with a certainty of 95%, the hypothesis that the number of listed companies does not affect the market capitalization in relation to GDP cannot be rejected and it can be concluded that the number of listed companies is in weak correlation to the population under the assumption that other variables are unchanged.

Ilustracija 5. Prikaz korelacije i determinacije broja listiranih kompanija i tržišne kapitalizacije u odnosu na BDP



Izvor: kalkulacija autora

Analizirajući korelaciju i determinaciju digitalizacije broja listiranih kompanija i indeksa razvoja finansijskog tržišta u uzorku, zapaža se da je R kvadrat (R2) jednak 0,21005888 (tabela 4). To znači da nezavisna varijabla (varijabla X – broj listiranih kompanija) objašnjava 21% varijable Y – tržišnu kapitalizaciju kao procenat BDP-a (ilustracija 6). Koeficijent višestruke korelacije (R) jednak je

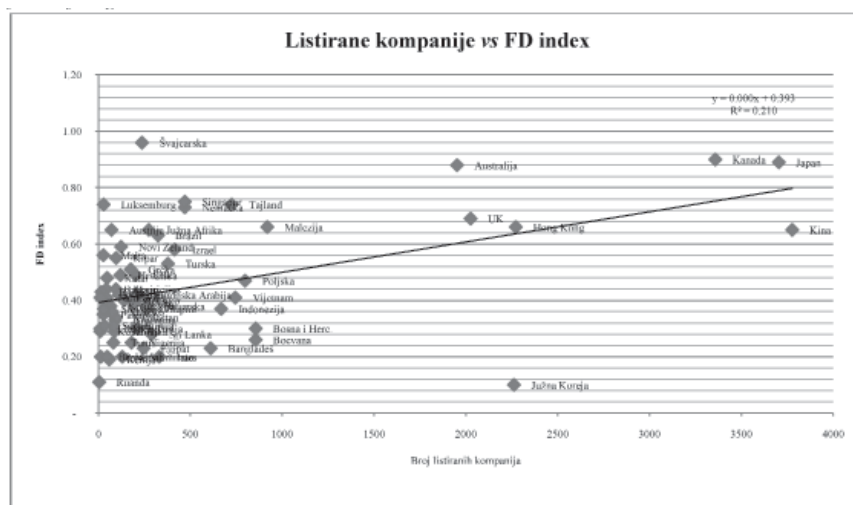
0,458321808, što znači slabu jaku direktnu vezu između nezavisne i zavisne varijable. S obzirom na to da je p-vrijednost 0,00013984 značajno manja od 0,05, sa sigurnošću od 95% možemo da odbacimo hipotezu da broj listiranih kompanija ne utiče na tržišni indeks finansijskog tržišta.

Tabela 4. Regresiona analiza podataka za broj listiranih kompanija i indeks razvijenosti finansijskog tržišta u uzorku

Multiple R	0,458321808
R Square	0,21005888
Adjusted R Square	0,197317894
Standard Error	0,181689948
Observations	64
F	16,48686238
Significance F	0,00013984
F crit	1,812212225
Test	odbacujemo

Izvor: kalkulacija autora

Ilustracija 6. Prikaz korelacije i determinacije broja listiranih kompanija i indeksa razvoja finansijskog tržišta u uzorku



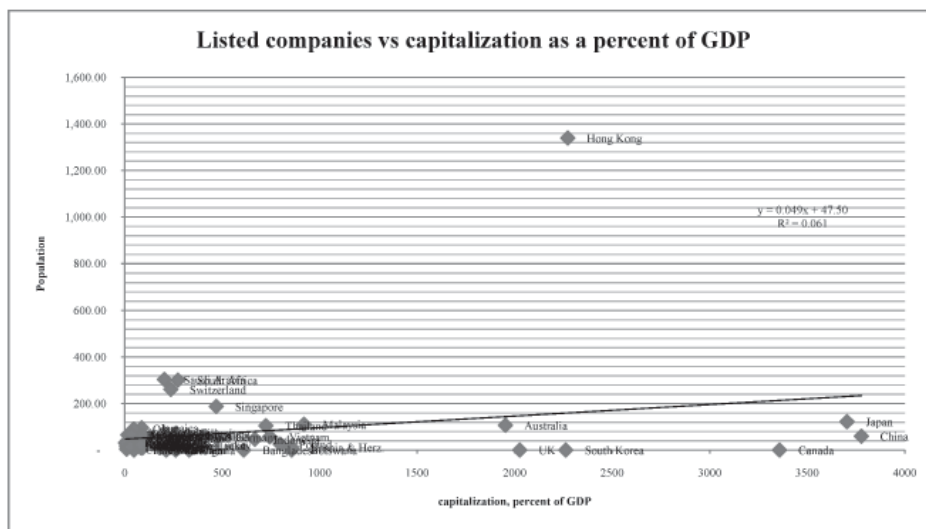
Izvor: kalkulacija autora

**Table 3:** Regression analysis of data for the number of listed companies and market capitalization as a percentage of GDP

Multiple R	0.24801262
R Square	0.06151026
Adjusted R Square	0.046373328
Standard Error	169.0460981
Observations	64
F	4.063588488
Significance F	0.048156289
F crit	1.812212225
Test	we accept

Source: Author's calculation

**Figure 5:** Review of the correlation and determination of the number of listed companies and market capitalization in relation to GDP



Source: Author's calculation

Analyzing the correlation and determination of digitalization of the number of listed companies and the financial market development index in the sample, it can be noticed that the R square (R2) is equal to 0.21005888 (Table 4). This means that the independent variable (variable X - number of listed companies) explains 21% of the variable Y - market capitalization as a percentage of GDP (Figure 4).

The multiple correlation coefficient (R) is equal to 0.458321808 which means that there is a weak direct correlation between the independent and dependent variables. Given that the p value of 0.00013984 is significantly less than 0.05 with a certainty of 95% we can reject the hypothesis that the number of listed companies does not affect the market index of the financial market.

**Table 4:** Regression analysis of data for the number of listed companies and the financial market development index in the sample

Multiple R	0.458321808
R Square	0.21005888
Adjusted R Square	0.197317894
Standard Error	0.181689948
Observations	64
F	16.48686238
Significance F	0.00013984
F crit	1.812212225
Test	we reject

Source: Author's calculation



## 4. DISKUSIJA

Dosad je na Banjalučkoj berzi realizovana jedna javna emisija akcija. U Federaciji BiH i dalje čekaju prvu. Kao odgovor na pitanje zašto u Bosni i Hercegovini nema inicijalnih javnih ponuda akcija moguće je otvoriti raspravu o volji i hrabrosti privrednika da se odreknu dijela vlasništva. Da bi se stvorio ambijent u kojem su i privredna društva i vlasnici spremni za izlazak na berzu, potrebno je da se odgovori na nekoliko dilema. Prvo, da vlasnici prihvate da odricanje od dijela vlasništva ne znači gubitak preduzeća. Drugo, da otvaranje donosi disperziju rizika i da preduzeće mora prihvatiti i implementirati transparentnost u poslovanju. Treće, nužno je prihvatiti benefite koje izlazak na berzu donosi. To su prikupljanje kapitala, veći nivo korporativnog upravljanja, odvajanje vlasničke i upravljačke funkcije, ali i mogućnost izdavanja novih akcija za povećanje kapitala, odnosno mogućnosti novog izvora za zaduživanje.

Relativno zatišje na berzama u svijetu posljedica je globalne krize, koja ostavlja traga i na regiju. Uz sve efekte krize treba znati i da tržišta kapitala nisu uvijek jednako efikasna i da berzama često upravljaju godišnji ciklusi, a ne fundamentalne vrijednosti. Poznato je da tržišta kapitala često bivaju vođena iracionalnim raspoloženjem ulagača koje se može temeljiti i na mentalitetu krda. Uz sve pobrojane razloge, ne treba zaboraviti i činjenicu da je dokazano da na uspavanim tržištima malo kompanija izlazi na berzu, dok su na rastućim tržištima učestalije javne ponude.

Pri odgovoru na pitanje zašto se većina preduzeća iz regije (još) ne odlučuje na izlistavanje akcija na berzi, treba imati u vidu da se velikom broju preduzeća finansiranje rasta i razvoja pomoću kredita kratkoročno još najviše isplati. Naime, jedan od nedostataka inicijalne ponude akcija je pojava novih troškova. Prvo, postoje nefinansijski troškovi, kao što su vrijeme i pažnja članova uprave jer ih taj posao može zaokupljati mjesecima. Na razvijenim tržištima prosječno vrijeme ovog procesa je devet mjeseci. Zatim se plaćaju naknade koje će posrednici i agenti naplatiti za svoje usluge. Akcionarsko društvo listirano na berzi plaća naknade za listiranje berzi, Centralnom registru, revizorima te ima troškove organizovanja i održavanja skupštine, unapređenja korporativnog upravljanja te za isplatu dividende akcionarima.

## ZAKLJUČAK

IPO svim, pa i domaćim privrednim društvima, povećava transparentnost poslovanja i odlučivanja, što strateškim ulagačima omogućava da neposredno odlučuju o politici preduzeća. Proces izlaska na berzu prati pažnja medija, što olakšava promovisanje preduzeća i bolju komunikaciju sa javnošću. Naime, mediji mnogo pažnje posvećuju akcionarskim društvima jer je interes za poslovanje akcionarskih društava veći u odnosu na privatna preduzeća. Uz to, kada su akcije nekog preduzeća već uvrštene na berzu, postoji način više za pribavljanje novca – sekundarnom javnom ponudom (SPO). U slučaju krize, u boljoj poziciji je preduzeće koje je novac pribavilo emisijom akcija od onog koje je do novca došlo kreditnim zaduženjem. Naime, novac prikupljen emisijom akcija nema rok dospijea i kamatnu stopu jer oni koji kupuju akcije u javnoj ponudi očekuju prinos po osnovu dividende ili očekuju kapitalnu dobit kroz rast cijena akcija. Kupujući akcije, sitni tržišni investitori dobijaju pravo na dio vlasništva nad kapitalnim dobrom. Duboka dobro organizovana finansijska tržišta čine da su investicije fiksne za društvo kao cjelinu i istovremeno likvidne za individualca (Radonjić, 2009).

Vlasnicima privrednog društva gubljenje apsolutne kontrole može da predstavlja značajan problem. Takvi vlasnici, kao alternativnu

kreditu, treba da razmotre mogućnost emitovanja korporativnih obveznica.

Na domaćem tržištu je očigledan otkup akcija društava sa ciljem delistiranja, uz paralelno ulaganje u dužničke hartije od vrijednosti koje emituje država. Ovaj proces može ukazivati na to da u finansijskom sistemu postoji višak likvidnosti. Drugim riječima, učesnici na tržištu imaju novca, ali ga ulažu u dužničke hartije od vrijednosti koje, najčešće, emituju entiteti.

Mnogo važnije od broja listiranih akcionarskih društava jeste da ona koja su uvrštena na berzu poštuju standarde korporativnog upravljanja i da koriste mogućnosti emisije hartija od vrijednosti. Dakle, da emituju akcije, komercijalne zapise i obveznice za finansiranje rasta i razvoja. Poredeći promete, tržišne kapitalizacije i bruto društveni proizvod regionalnih i razvijenih berzi, očigledno je da na regionalnim berzama ima i previše uvrštenih akcionarskih društava (te je odnos tržišne kapitalizacije i BDP-a na regionalnim berzama relativno visok), ali nema dovoljno interesa za kupovinu tih akcija (odnos prometa i BDP-a je niži). Dakle, delistiranje velikog broja kompanija i pojava sve više obveznica i trezorskih zapisa na berzi je sasvim logičan i očekivan put razvoja tržišta kapitala. Razlog za brigu je činjenica da se veliki broj dobrih kompanija, koje odlikuje velika likvidnost, dobar bonitet i dobar kreditni rejting, uglavnom povlači sa berze. Pritom, mali broj listiranih društava isplaćuje dividendu. Ilustracije radi, samo 11 listiranih akcionarskih društava u Republici Srpskoj je prošle godine isplatilo dividendu.

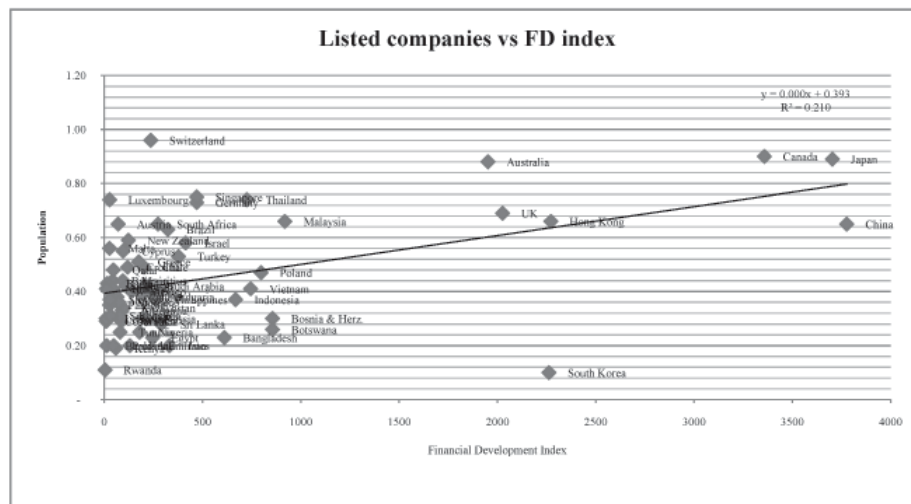
Istraživanje pokazuje da broj listiranih kompanija utiče sa oko 1,1% BDP-a *per capita*. Koeficijent višestruke korelacije (R) jednak je 0,106842566, što znači da ne postoji direktna veza između nezavisne i zavisne varijable. Prema tome, može se prihvatiti hipoteza da broj listiranih akcionarskih društava ne utiče na bogatstvo i razvijenost zemlje mjereno BDP-om *per capita*.

Posmatramo odnos broja listiranih kompanija i broja stanovnika i zapažamo da je R kvadrat (R<sup>2</sup>) jednak 0,257584801. Koeficijent višestruke korelacije (R) jednak je 0,507528129, što znači slabu direktnu vezu između nezavisne i zavisne varijable. S obzirom na to da je p-vrijednost 0,0000187 značajno manja 0,05, sa sigurnošću od 95% može da se odbaci hipoteza da broj listiranih kompanija ne utiče na broj stanovnika. Dakle, broj listiranih kompanija stoji u slaboj vezi sa brojem stanovnika pod pretpostavkom nepromijenjenih ostalih varijabli.

Kada se posmatra odnos listiranih kompanija po zemljama i tržišna kapitalizacija na berzama u odnosu na BDP, zapaža se da je R<sup>2</sup> jednak 0,06151026. Koeficijent višestruke korelacije jednak je 0,24801262, što znači slabu direktnu vezu između nezavisne i zavisne varijable. S obzirom na to da je p-vrijednost 0,048156289 značajno manja 0,05, sa sigurnošću od 95% može se prihvatiti hipoteza da broj listiranih kompanija ne utiče na tržišnu kapitalizaciju u odnosu na BDP. Dakle, može se zaključiti da broj listiranih kompanija stoji u slaboj vezi sa brojem stanovnika pod pretpostavkom nepromijenjenih ostalih varijabli.

Analizirajući korelaciju i determinaciju digitalizacije broja listiranih kompanija i indeksa razvoja finansijskog tržišta u uzorku, zapaža se da je R<sup>2</sup> jednak 0,21005888. To znači da nezavisna varijabla – broj listiranih kompanija objašnjava 21% tržišne kapitalizacije kao procenat BDP-a. Koeficijent višestruke korelacije jednak je 0,458321808, što znači slabu jaku direktnu vezu između nezavisne i zavisne varijable. S obzirom na to da je p-vrijednost 0,00013984 značajno manja 0,05, sa sigurnošću od 95% možemo da kažemo da broj listiranih kompanija utiče na tržišni indeks finansijskog tržišta.

**Figure 6:** Review of the correlation and determination of the number of listed companies and the financial development index of the market in the sample



Source: Author's calculation

## 4. DISCUSSION

So far, one public issue of shares has been realized on the Banja Luka Stock Exchange. In the Federation of BiH, they are still waiting for the first one. In response to the question why there are no initial public offerings of shares in Bosnia and Herzegovina, it is possible to open a debate on the will and courage of businessmen to give up part of their ownership. In order to create an environment in which both companies and owners are ready to go public, it is necessary to answer several dilemmas. Firstly, that the owners accept that the renunciation of part of ownership does not mean the loss of the company. Secondly, that opening and going public brings a dispersion of risk and that the company must accept and implement transparency in business. Thirdly, it is necessary to accept the benefits that going public brings. These are the raising of capital, a higher level of corporate governance, the separation of ownership and management functions, but also the possibility of issuing new shares to increase capital i.e. the possibility of a new source of borrowing.

The relative calm on stock exchanges in the world is a consequence of the global crisis, which has also left a trace across the region. In addition to all the effects of the crisis, it should be noted that capital markets are not always equally efficient and that stock exchanges are often governed by annual cycles rather than fundamental values. It is well known that capital markets are often driven by an irrational mood of an investor that can also be based on a herd mentality. In addition to all the above reasons, we should not forget the fact that it has been proven that few companies go public on dormant markets, while public offerings are more frequent in growing markets.

When answering the question why most companies from the region do not (yet) decide to list their shares on the stock exchange, one should have in mind that for a large number of companies, financing growth and development with loans pays off the most in the short term. Namely, one of the disadvantages of the initial offer of shares is the emergence of new costs. Firstly, there are non-financial costs, such as the time and attention of members of the management because that job can keep them busy for months. In developed markets, the average time of this process is nine months. The fees that intermediaries and agents will charge for their services are then paid. A joint stock company listed on the stock exchange pays fees for listing to the stock exchange, to the Central Registry, to auditors and it has the costs of organizing and holding the general assemblies, improving corporate governance and paying dividends to shareholders.

## CONCLUSION

The IPO for all, including domestic companies, increases the transparency of business and decision-making, which enables strategic investors to directly decide on company policy. The process of going public is accompanied by media attention, which facilitates the promotion of a company and better communication with the public. Namely, the media pay a lot of attention to joint stock companies because the interest in the business of joint stock companies is higher than interest in private companies. In addition, when the shares of a company are already listed on the stock exchange, there is more way to raise money - through a secondary public offering (SPO). In the event of a crisis, the company that obtained the money by issuing shares is in a better position than the one that obtained the money through loan indebtedness. Namely, the money collected by the issue of shares does not have a maturity and interest rate because those who buy shares in the public offering expect a dividend yield or expect a capital gain through share prices growth. By buying shares, small market investors get a share of the ownership of the capital good. Deep well-organized financial markets make investments fixed for society as a whole and at the same time liquid for the individual (Radonjić 2009).

For business owners, losing absolute control can be a significant problem. Such owners, as an alternative to loan, should consider issuing corporate bonds.

In the domestic market, the purchase of company shares is obvious with the aim of delisting with a parallel investment in debt securities issued by the state. This process may indicate that there is excess liquidity in the financial system. In other words, market participants have money but they invest it in debt securities that are most often issued by the entities.

Much more important than the number of listed joint stock companies is that those listed on the stock exchange respect corporate governance standards and that they take advantage of the issue of securities. Therefore, to issue shares, commercial papers and bonds to finance development growth. Comparing the turnover, market capitalization and gross domestic product of regional and developed stock exchanges, it is obvious that there are too many listed joint stock companies on regional stock exchanges (and the ratio of market capitalization and GDP on regional stock exchanges is relatively high), but there is not enough interest to buy those shares (turnover-to-GDP ratio is lower). Therefore, the delisting of a

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**Prilog**

Country	Listed companies	GDP per capita	Population	Capitalization, percent of GDP	FD index
Argentina	91	22.063,90	44,94	8,84	0,33
Australia	1.952	49.611,86	25,36	106,52	0,88
Austria	71	56.029,61	8,88	29,90	0,65
Bahrein	43	45.010,71	1,64	69,69	0,44
Bangladesh	611	4.753,73	163,05	-	0,23
Barbados	16	15.638,83	0,29	65,23	0,43
Bermuda	13	81.797,87	0,06	39,62	0,20
Bosnia & Herz.	856	14.922,15	3,30	12,00	0,30
Botswana	856	17.766,54	2,30	-	0,26
Brazil	324	14.651,62	211,05	64,54	0,63
Bulgaria	262	23.265,62	6,98	66,40	0,38
Canada	3.358	48.886,76	37,59	101,50	0,90
Chile	203	25.131,46	18,95	72,19	0,49
China	3.777	16.116,66	1.397,71	59,37	0,65
Colombia	66	14.624,97	50,34	40,80	0,38
Costa Rica	10	20.296,82	5,05	3,59	0,29
Croatia	119	28.829,36	4,07	36,97	0,49
Cyprus	96	39.544,68	1,20	17,17	0,55
Egypt	246	11.763,25	100,39	14,58	0,23
Germany	470	53.784,78	83,13	54,34	0,73
Greece	176	30.465,45	10,72	25,57	0,51
Hong Kong	2.272	59.847,55	7,51	1.339,64	0,66



large number of companies and the appearance of more and more bonds and treasury bills on the stock exchange is a completely logical and expected way of the capital market development. The reason for concern is the fact that a large number of good companies, which are characterized by high liquidity, good creditworthiness and good credit rating, are mostly withdrawn from the stock exchange. At the same time, a small number of listed companies pay dividends. For illustration's sake, only 11 listed joint stock companies in Republika Srpska paid a dividend last year.

The research shows that the number of listed companies affects with about 1.1% of GDP per capita. The multiple correlation coefficient (R) is equal to 0.106842566 which means that there is no direct correlation between the independent and dependent variable. Therefore, hypothesis can be accepted that the number of listed joint stock companies does not affect the wealth and development of a country as measured by GDP per capita.

We observe the ratio of the number of listed companies to the number of inhabitants, and it can be noticed that R square (R<sup>2</sup>) is equal to 0.257584801. The multiple correlation coefficient (R) is equal to 0.507528129 which means that there is a weak direct correlation between the independent and dependent variables. Given that the p value of 0.0000187 is significantly less than 0.05 with a certainty of 95%, the hypothesis that the number of listed companies does not affect the number of inhabitants can be rejected. Thus, the number of listed companies is weakly related to the number of inhabitants under the assumption that other variables are unchanged.

When observing the ratio of listed companies by countries and market capitalization on stock exchanges in relation to GDP, it can be noticed that R<sup>2</sup> is equal to 0.06151026. The multiple correlation coefficient is equal to 0.24801262, which means that there is a weak direct correlation between the independent and dependent variables. Given that the p value of 0.048156289 is significantly less than 0.05 with a certainty of 95%, the hypothesis that the number of listed companies does not affect the market capitalization in relation to GDP can be accepted. Thus, it can be concluded that the number of listed companies is weakly related to the number of inhabitants under the assumption that other variables are unchanged.

Analyzing the correlation and determination of digitalization of the number of listed companies and the financial market development index in the sample, it can be noticed that R<sup>2</sup> is equal to 0.21005888. This means that the independent variable - the number of listed companies explains 21% of the market capitalization as a percentage of GDP. The multiple correlation coefficient is equal to 0.458321808 which means that there is a weak direct correlation between the independent and dependent variables. Given that the p value of 0.00013984 is significantly less than 0.05 with a certainty of 95% we can say that the number of listed companies affects the market index of the financial market.

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## Appendix

County	Listed companies	GDP per capita	Population	Capitalization, percent of GDP	FD index
Argentina	91	22.063,90	44,94	8,84	0,33
Australia	1.952	49.611,86	25,36	106,52	0,88
Austria	71	56.029,61	8,88	29,90	0,65
Bahrain	43	45.010,71	1,64	69,69	0,44



Hungary	44	32.643,49	9,77	20,12	0,41
Indonesia	668	11.812,20	270,63	46,76	0,37
Iran	331	12.389,22	82,91	-	0,20
Israel	414	40.203,39	9,05	60,15	0,58
Jamaica	87	9.761,50	2,95	95,80	0,29
Japan	3.704	41.667,18	126,26	121,83	0,89
Kazakhstan	94	26.351,44	18,51	22,37	0,34
Kenya	59	4.329,87	52,57	26,24	0,19
Lebanon	10	14.551,58	6,86	14,88	0,30
Luxembourg	28	114.323,41	0,62	62,21	0,74
Malaysia	919	28.364,49	31,95	110,77	0,66
Malta	27	43.707,54	0,50	35,46	0,56
Mauritius	95	22.870,29	1,27	61,33	0,44
Mexico	139	19.765,92	127,58	32,60	0,40
Morocco	74	7.514,72	36,47	54,65	0,36
Namibia	11	9.637,18	2,49	21,10	0,41
New Zealand	123	43.695,15	4,92	52,13	0,59
Nigeria	180	5.135,50	200,96	9,80	0,25
Oman	111	27.299,41	4,97	22,43	0,42
Palestine	48	6.219,96	4,69	2,00	0,20
Panama	27	31.458,69	4,25	25,21	0,35
Peru	196	12.847,88	32,51	43,63	0,39
Philippines	265	8.908,18	108,12	73,06	0,37
Poland	798	33.221,54	37,97	25,45	0,47
Qatar	47	90.043,93	2,83	91,02	0,48
Romania	81	29.983,56	19,36	10,44	0,31
Russia	213	27.043,94	144,37	96,60	0,30
Rwanda	4	2.226,86	12,63	31,04	0,11
Saudi Arabia	204	46.962,15	34,27	303,52	0,42
Seychelles	33	29.223,46	0,10	66,72	0,31
Singapore	470	97.341,47	5,70	187,41	0,75
Slovenia	29	39.037,93	2,09	14,63	0,37
South Africa	274	12.481,81	58,56	300,58	0,65
South Korea	2.262	42.878,82	51,71	2,00	0,10
Sri Lanka	289	13.078,10	21,80	18,71	0,28
Switzerland	237	68.394,29	8,57	260,92	0,96
Thailand	725	18.459,99	69,63	104,72	0,74
Tunisia	81	10.755,61	11,69	21,92	0,25
Turkey	378	28.289,09	83,43	24,29	0,53
UA Emirates	130	67.119,13	9,77	58,70	0,20
UK	2.026	46.704,32	66,83	102,66	0,69
Vietnam	745	8.041,18	96,46	57,20	0,41

Izvor: prikaz autora

Bangladesh	611	4.753,73	163,05	-	0,23
Barbados	16	15.638,83	0,29	65,23	0,43
Bermuda	13	81.797,87	0,06	39,62	0,20
Bosnia & Herz.	856	14.922,15	3,30	12,00	0,30
Botswana	856	17.766,54	2,30	-	0,26
Brazil	324	14.651,62	211,05	64,54	0,63
Bulgaria	262	23.265,62	6,98	66,40	0,38
Canada	3.358	48.886,76	37,59	101,50	0,90
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Romania	81	29.983,56	19,36	10,44	0,31
Russia	213	27.043,94	144,37	96,60	0,30
Rwanda	4	2.226,86	12,63	31,04	0,11
Saudi Arabia	204	46.962,15	34,27	303,52	0,42
Seychelles	33	29.223,46	0,10	66,72	0,31
Singapore	470	97.341,47	5,70	187,41	0,75
Slovenia	29	39.037,93	2,09	14,63	0,37
South Africa	274	12.481,81	58,56	300,58	0,65
South Korea	2.262	42.878,82	51,71	2,00	0,10
Sri Lanka	289	13.078,10	21,80	18,71	0,28
Switzerland	237	68.394,29	8,57	260,92	0,96
Thailand	725	18.459,99	69,63	104,72	0,74
Tunisia	81	10.755,61	11,69	21,92	0,25
Turkey	378	28.289,09	83,43	24,29	0,53
UA Emirates	130	67.119,13	9,77	58,70	0,20
UK	2.026	46.704,32	66,83	102,66	0,69
Vietnam	745	8.041,18	96,46	57,20	0,41

Source: Author's review

# UPUTSTVO AUTORIMA

## 1. DOSTAVLJANJE RADOVA

Radovi se objavljuju pod uslovom da nisu prethodno objavljivani, niti je podnesen zahtjev za njihovo objavljivanje u nekom drugom časopisu. Radovi koji nisu adekvatno pripremljeni na osnovu ovog uputstva neće se uzimati u razmatranje.

Radovi sa priložima obavezno se dostavljaju u elektronskom obliku. Tekst rada i grafički prilozi (fotografije, grafikoni) moraju biti odvojeni dokumenti i u pogodnom obliku za konvertovanje i tehničko manipulisanje.

Prilikom dostavljanja rada, autor dostavlja i kontakt podatke: ime i prezime sa srednjim slovom, naučno i titularno zvanje, brojeve mobilnog i fiksnog telefona, poštansku adresu, elektronsku adresu, naziv ustanove u kojoj je zaposlen i radno mjesto u toj ustanovi.

Samo podaci koji se navode kao dio opreme članka (tzv. metapodaci) biće objavljeni u časopisu.

## 2. PRAVA I OBAVEZE AUTORA I IZDAVAČA

Za objavljivanje se prihvataju radovi koji, po mišljenju urednika i recenzenata, zadovoljavaju kriterijume časopisa u pogledu relevantnosti, profesionalnog nivoa i aktuelnosti. Redakcija zadržava pravo da radove prilagodi opštim pravilima uređivanja časopisa i standardu jezika.

Za sva mišljenja iznesena u objavljenom radu odgovoran je isključivo autor. Urednik, recenzenti ili izdavač ne prihvataju odgovornost za autorova iznesena mišljenja.

Ukoliko je rad prihvaćen za objavljivanje, pravo reprodukcije rada u svim drugim medijima pripada izdavaču od datuma prihvatanja.

Prilog treba da bude pripremljen prema standardima časopiša. Ukoliko se ne poštuju kriterijumi navedeni u nastavku, redakcija može da ne prihvati tekst ili da traži da se rad prilagodi, zbog čega objavljivanje može da kasni.

## 3. TEHNIČKE NORME OBLIKOVANJA ČLANKA

### 3.1. Obim rada

Rad treba da ima najviše do 15 strana A4 formata (između 15.0000 i 30.000 znakova).

### 3.2. Formati dokumenata, stilovi i oblikovanje

Tekst rada u elektronskom obliku mora biti u jednom od standardnih formata: doc, docx, rtf (*Microsoft Word*).

Ilustrativne priloge treba priložiti u elektronskoj formi kao zasebne datoteke u nekom od standardnih formata: ai, cdr, eps (grafikoni, šeme) ili jpeg, tiff, gif, pdf (fotografije) sa rezolucijom od najmanje 300 tačaka po inču u prirodnoj veličini. U tekstu rada treba jasno označiti mjesto gdje se prilog pojavljuje i naziv priloga kako je označen na mediju.

Bez obzira na jezik, neophodno je da rad bude otkucan u fontu koji podržava unikatni standard (*Unicode*), po mogućnosti *Times New Roman*.

### 3.3. Jezik i pismo rada

Jezik rada, pored srpskog ili drugog jezika konstitutivnih naroda BiH može biti bilo koji jezik raširene upotrebe u međunarodnoj komunikaciji i u datoj naučnoj oblasti.

### 3.4. Sastavni dijelovi opreme članka

#### 3.4.1. Ime autora

Navodi se puno ime i prezime (svih) autora, sa srednjim slovom. Prezimena i imena domaćih autora uvijek se ispisuju u originalnom obliku (sa srpskim dijakritičkim znakovima), nezavisno od jezika rada. Naučna i titularna zvanja autora u tekstu za objavu se ne navode (npr. *prof., dr...*).

#### 3.4.2. Kontakt podaci

Adresa ili e-adresa autora objavljuje se u časopisu. Ako je autora više, daje se samo adresa jednog, obično prvog autora.

#### 3.4.3. Naziv ustanove autora (afilijacija)

Navodi se pun (zvanični) naziv i sjedište ustanove u kojoj je autor zaposlen, a eventualno i naziv ustanove u kojoj je autor obavio istraživanje. U složenim organizacijama navodi se ukupna hijerarhija. Bar jedna organizacija u hijerarhiji mora biti pravno lice. Ako je autora više, a neki potiču iz iste ustanove, mora se naznačiti iz koje od navedenih ustanova potiče svaki od navedenih autora.

# INSTRUCTIONS FOR AUTHORS

## 1. DELIVERY OF PAPERS

Papers are published on condition that they have not been previously published, nor have they been requested for publishing them in another magazine. Papers that are not adequately prepared on the basis of this instruction will not be taken into consideration.

Papers with attachments must be submitted electronically. The text and graphics (photographs, graphs) must be separate documents and in a suitable form for conversion and technical manipulation.

When submitting the paper, the author also submits contact information: name and surname with the middle letter, scientific and titular title, mobile and fixed telephone numbers, postal address, e-mail address, the name of the institution in which he/she is employed and a position in that institution.

Only the data that classifies as part of the article equipment (so-called metadata) will be published in the journal.

## 2. RIGHTS AND OBLIGATIONS OF AUTHORS AND PUBLISHERS

Only papers which, in the opinion of editors and reviewers, meet the criteria of the journal in terms of relevance, professional level and actuality, are published. The editorial board reserves the right to adapt the paper to the journal policy and the language standard.

All the opinions expressed in the published paper are solely responsibility of the author. Editor, reviewers or publisher do not accept responsibility for the author's expressed opinions.

If the paper is accepted for publication, the right to reproduce work in all other media belongs to the publisher from the date of acceptance.

The attachment should be prepared according to the standards of the journal. If the criteria listed below are not respected, the editorial board may not accept the text or request adjustments, which may cause the publication to be delayed.

## 3. TECHNICAL NORMS OF ARTICLE DESIGN

### 3.1. The scope of paper

The paper should have up to 15 pages of A4 format (between 15.000 and 30.000 characters).

### 3.2. Document formats, styles and design

The text in electronic format must be in one of the standard formats: doc, docx, rtf (Microsoft Word).

Illustrative attachments should be submitted electronically as separate files in one of the standard formats: ai, cdr, eps (charts, schemes) or jpeg, tiff, gif, pdf (photos) with a resolution of at least 300 dpi in natural size. The text of the paper should clearly indicate the place where the attachment should appear and the name of the attachment as it is marked on the medium.

Regardless of the language, the paper needs to be typed in a font that supports a unique standard (Unicode), preferably Times New Roman.

### 3.3. Paper language and letter

The language of paper, in addition to Serbian or the language of other constituent nations in B&H, can be any language of widespread use in international communication and in a given scientific field.

### 3.4. Components of the article equipment

#### 3.4.1. Author name

The full name of (all) authors, with a middle letter, is listed. The first and last names of domestic authors are always printed in their original form (with Serbian diacritics), regardless of the language of paper. Scientific and titular titles of the author in text for publication are not listed (for example, PhD).

#### 3.4.2. Contact Information

The address or e-mail address of the author is published in the journal. If there are multiple authors, only the address of one, usually the first author, is listed.

#### 3.4.3. Name of the author's institution (affiliation)

The full (official) name and headquarters of the institution in which the author is employed is listed, and possibly the name of the institution in which the author performed the research. In complex organizations, the overall hierarchy is listed. At least one organization in the hierarchy must be a legal entity. If there are multiple authors is, and some of them are employed by the same institution, the institution of each author has to be listed.



#### 3.4.4. Naslov

U opštem je interesu da se u naslovu koriste riječi prikladne za indeksiranje i pretraživanje. Ako takvih riječi nema u naslovu, poželjno je da se naslovu pridoda podnaslov. Naslov se ispisuje na dva jezika, i to:

- u datoteci priloga, na dva mjesta – na početku rada (na jeziku na kome je napisan rad) i u rezimeu (na jeziku na kome je napisan rezime).

#### 3.4.5. Podnaslovi

Podnaslovi se numerišu po nivoima, arapskim brojevima, po principu: *1. Prvi podnaslov, 2. Drugi podnaslov, 2.1. Prvi podnaslov drugog reda, 2.2. Drugi podnaslov drugog reda, 3. Treći podnaslov...* (poput strukture podnaslova korišćene u ovom uputstvu).

#### 3.4.6. Rezime

Rezime je kratak informativan prikaz sadržaja članka koji čitaocu (ali i učesnicima u uređivačkom procesu) omogućava da brzo i tačno ocijeni njegovu relevantnost. U interesu je autora da sažeci sadrže termine koji se često koriste za indeksiranje i pretragu članaka. Sastavni dijelovi sažetka su cilj istraživanja, metodi, rezultati i zaključak.

Sažetak treba da ima od 100 do 200 riječi i treba da stoji:

- u datoteci priloga, između naslova i ključnih riječi. Sažetak mora biti napisan na jeziku na kome je i rad. Sažetak ne sadrži reference.

Ukoliko je rad samo na srpskom jeziku, rezime treba da bude napisan i na engleskom jeziku. Za rezime na engleskom jeziku autor mora obezbijediti gramatičku i pravopisnu ispravnost. Obim rezimea može biti do 1/10 obima članka.

#### 3.4.7. Ključne riječi

Ključne riječi su termini koje najbolje opisuju sadržaj članka za potrebe indeksiranja i pretraživanja. Treba ih dodjeljivati s osloncem na neki međunarodni izvor (popis, rječnik ili tezaurus) koji je najšire prihvaćen unutar date naučne oblasti.

Broj ključnih riječi ne smije biti veći od osam.

Ključne riječi daju se na jeziku na kome je napisan rad i na jeziku na kome je napisan rezime. U članku se daju neposredno nakon rezimea.

#### 3.4.8. Sadržaj rada

Rad treba da bude relevantan za naučnu i stručnu javnost, sa jasno naglašenim ciljevima, uvodom, primijenjenim metodama, rezultatima istraživanja, diskusijom, zaključkom, referencama u tekstu i bibliografskim jedinicama na kraju. Ideje u radu moraju biti originalne i značajno doprinositi razvoju predmeta istraživanja, a metodologija mora biti jasno opisana.

#### 3.4.9. Tabelarni i grafički prikazi

Tabelarni i grafički prikazi treba da budu dati na jednoobrazan način. Svaka tabela, grafikon ili slika moraju biti označeni brojem po redoslijedu navođenja u tekstu, s adekvatnim nazivom (npr.: *Tabela 2. Pouzdanost varijabli*).

#### 3.4.10. Citiranje

Citiranje je doslovno navođenje tuđih otkrića, spoznaja, teorija, definicija, dokaza, stavova, teza, interpretacije mišljenja, podataka i sl. i njihovo jasno odvajanje od autorovih, te naznačavanje bibliografskog izvora iz kojeg potiču.

Pozivanje na izvore citiranog teksta označava se u zagradi na mjestu gdje se on nalazi, navođenjem prezimena autora, godine izdanja djela i stranice s koje je citat preuzet, a sam tekst se stavlja pod navodnike.

#### 3.4.11. Implicitno navođenje teksta (parafraziranje)

Implicitno navođenje ili parafraziranje je prenošenje otkrića, spoznaja, teorija, definicija, dokaza, stavova, teza, interpretacije mišljenja, podataka i sl. nekog drugog autora, ali ne doslovno, kako stoji u korišćenom izvoru, već na sopstveni način, odnosno sopstvenim izražajnim stilom.

Informacioni sadržaj parafraziranjem mora biti prenesen jasno i vjerodostojno, ali sopstvenim stilskim izražajem. Parafrazirani tekst nije iste dužine kao izvorni, on može biti duži ili kraći u zavisnosti od cilja koji se želi postići, ali mora sačuvati suštinu izvornog teksta.

Pozivanje na izvore parafraziranog teksta označava se u zagradi na mjestu u tekstu gdje se on nalazi, navođenjem prezimena autora i godine izdanja djela iz kojeg je tekst preuzet u zagradi.

#### 3.4.12. Napomene (fusnote)

Napomene se daju pri dnu strane na kojoj se nalazi komentarisani dio teksta. Ne unose se „ručno“, već uz pomoć automatskih alatki za označavanje fusnota u konkretnom programu.

#### 3.4.4. Title

It is general interest to use words suitable for indexing and searching in the title. If there are no such words in the title, it is advisable to add a subtitle to the title. The title is written in two languages:

in the attachment file, in two places - at the beginning of the paper (in the language in which the paper is written) and in the summary (in the language in which the summary is written).

#### 3.4.5. Subtitles

The subtitles are numbered by levels, using Arabic numerals, according to the principle: 1. First subtitle, 2. Second subtitle, 2.1. The first subtitle of the second order, 2.2. The second subtitle of the second order, 3. Third subtitle ... (like the subtitle structure used in this manual).

#### 3.4.6. Summary

The summary is a brief informative overview of the contents of the article that allows the reader (but also the participants in the editorial process) to quickly and accurately assess its relevance. It is in the author's interest that the summaries contain terms that are often used to index and search articles. The constituent parts of the summary are the aim of the research, the methods, the results and the conclusion.

The summary should contain from 100 to 200 words and should be in the attachment file, between titles and keywords.

The summary must be written in the same language as the paper. The summary does not contain references.

If the paper is in Serbian only, the summary should also be written in English as well. For the English summary, the author is responsible for grammatical and spelling accuracy. The scope of the summary can be up to 1/10 of the scope of the article.

#### 3.4.7. Keywords

Keywords are terms that best describe the content of the article for indexing and search purposes. They should be assigned with a reference to an international source (list, dictionary or thesaurus) that is most widely accepted within the given scientific field.

The number of keywords must not exceed eight.

Keywords are given in the language in which the paper is written and in the language in which the summary is written. In the article they are provided after the summary.

#### 3.4.8. Content of paper

The paper should be relevant to the scientific and professional public, written in accordance with IMRAD (Introduction, Method, Results and Discussion) by the presence of text organization with clearly stated goals, introduction, applied methods, research results, discussion, conclusion, references in the text and bibliographic units at the end. The ideas in the paper must be original and significantly contribute to the development of the subject of research, and the methodology must be clearly described.

#### 3.4.9. Tabular and graphic representations

Tabular and graphic representations should be presented in a uniform manner. Each table, chart, or image must have a number assigned according to the order in which they appear in the paper, with the appropriate title (for example: Table 2. Reliability of variables).

#### 3.4.10. Quoting

Quoting is a literal reference to others' discoveries, cognitions, theories, definitions, proofs, attitudes, theses, interpretations of opinions, data, and so on, their clear separation from author's, and the identification of the bibliographic source from which they originate.

Source of the quoted text is indicated in brackets at the place where it is located, by naming the author's surnames, the year of publication of the work and the page from which the quote was taken, and the quoted text is under quotation marks.

#### 3.4.11. Implicit citing (paraphrasing)

Implicit citing or paraphrasing is the transfer of discoveries, cognitions, theories, definitions, proofs, attitudes, theses, interpretations of opinions, data, etc. of another author, not literally, as it is in the used source, but in author's own manner or own expressive style.

Paraphrased content must be cited clearly and credibly, but in the author's own style. The paraphrased text is not the same length as the original, it may be longer or shorter depending on the goal to be achieved, but it must preserve the essence of the source text.

Source of the paraphrased text is indicated in brackets at a place where it is located by stating the surname of the author and the year of publication of the work from which the text was taken.

#### 3.4.12. Notes (footnotes)

The notes are provided at the bottom of the page where the commented part of the text is located. They are not inserted "manually", but with the help of automatic tools in a specific program.

#### 3.4.13. Korišćeni izvori u radu

Izvori obuhvataju, po pravilu, bibliografske izvore (članke, monografije i sl.) i daje se isključivo u zasebnom odjeljku članka, u vidu liste referenci. Reference se ne prevode na jezik rada, niti se preslovljavaju.

Za različite vrste bibliografskih jedinica različito se navode bibliografski podaci. Treba poštovati pravila standarda APA, <http://www.apastyle.org/index.aspx>. Nestandardno, nepotpuno ili nedosljedno navođenje izvora jedan je od kriterijuma za objavljivanje članka u časopisu.

U spisku literature navode se samo reference koje je autor koristio pri izradi, abecednim redom po prezimenima autora ili naslovu citirane reference ukoliko se ona tretira kao anonimno djelo.

Ako publikacija ima više izdavača i/ili mjesta izdanja, navodi se samo prvi.

Nema nikakve potrebe navoditi seriju, biblioteku u kojoj je knjiga izdata (to važi i za sabrana/izabrana djela), niti prevodioca, ako je monografija prevedena.

Ako je relevantno istaći broj izdanja, on se navodi iza naslova, u zagradi.

#### 3.4.14. Prilog

U prilogu bi trebalo dati samo one opise materijala koji bi čitaocima bili korisni za razumijevanje, evaluiranje ili ponavljanje istraživanja.

### 3.5. Jezičke preporuke

Jezik rada treba da pripada naučnom stilu standardnog jezika i da, stoga, bude usaglašen u što je moguće većoj mjeri s pravopisnom, gramatičkom i stilskom normom.

Individualne skraćenice bi trebalo izbjegavati, a ako se koriste, moraju biti raščitane pri prvoj upotrebi.

#### *3.4.13. The sources used in the paper*

Sources include, as a rule, bibliographic sources (articles, monographs, etc.) and are listed exclusively in a separate section of the article, in the form of a list of references. References are not translated into the language of the paper, nor is their letter changed.

Bibliographic data is listed differently for different types of bibliographic units. APA rules must be respected, <http://www.apastyle.org/index.aspx>. Non-standard, incomplete or inconsistent source guidance is one of the criteria for disregarding the article.

Only the references used by the author are listed in the literature list, in the alphabetical order of the author's surnames or the sources' titles, for those that are treated as anonymous works.

If the publication has multiple publishers and / or publishing sites, only the first one is listed.

There is no need to indicate the series, the library in which the book was issued (this also applies to the collected / selected papers), nor the translator, if the monograph is translated.

If it is relevant to indicate the issue number, it is listed behind the title, in brackets.

#### *3.4.14. Attachment*

Attachments should only provide descriptions of materials that would be useful for readers to understand, evaluate or repeat the research.

### **3.5. Language recommendations**

The language of paper should belong to the scientific style of the standard language and, therefore, be as harmonized as possible with spelling, grammatical and stylistic norms.

Individual abbreviations should be avoided, and if they are used, they must be explained at first use.

