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DA LI PROFITABILNOST BANAKA UTIČE NA PRIVREDNI RAST: PRIMERI BANAKA POJEDINIH ZEMALJA ZAPADNOG BALKANA

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Rezime

Banke imaju važnu ulogu u privredi jedne zemlje zato što povećanje štednje i akumulacije kapitala pozitivno utiče na privredni rast i zaposlenost kroz funkciju transfera resursa banke. Svrha ovog istraživanja je da se utvrdi uzročno-poslijedična veza između profitabilnosti banaka i ekonomskog rasta u tri odabrane zemlje, uključujući Bosnu i Hercegovinu, Srbiju i Hrvatsku. U ovom istraživanju se primenjuje panel test uzročnosti za ispitivanje uzročno-posledične veze za vremenski period od prvog kvartala 2008. godine do četvrtog kvartala 2020. godine. Empirijski nalazi u ovom istraživanju su pokazali da profitabilnost banaka u odabranim zemljama u razvoju (Bosna i Hercegovina, Srbija i Hrvatska) utiče pozitivno na ekonomski rast. Takođe, ovo istraživanje daje uvid u dubinsku analizu u kontekstu razmatranja nekoliko zemalja putem korišćenja panel testa uzročnosti, a za potrebe proučavanja odnosa između profitabilnosti banaka i ekonomskog rasta.

Ključne reči: Ekonomski rast; profitabilnost banaka; Grendžerova kauzalnost

JEL klasifikacija: G21, O43, C23

Uvod

Banke igraju centralnu ulogu u funkcionisanju privredne aktivnosti. Pored toga, zdrav bankarski sistem je od velikog značaja za održivi ekonomski razvoj. Bankarski sektor ispunjava važnu ekonomsku funkciju u obezbeđivanju finansijskog posredovanja i ekonomskog zamaha pretvaranjem depozita u produktivne investicije. U datom kontekstu banke su bitni finansijeri i važne su za stabilnost bankarskog sektora (Menicucci ve Paolucci, 2016). I eksterni faktori i faktori specifični za zemlju utiču na strukturu i učinak bankarskog sektora. Zdrav i profitabilan bankarski sektor povećava otpornost banaka na negativne šokove, te doprinosi stabilnosti finansijskog sistema. Posmatrano u kontekstu ekonomske krize iz 2007-2008. godine, pokazalo se da negativnosti u bankarskom sektoru mogu destabilizovati finansijski sistem pretvarajući se u sistematski rizik, izazivajući usporavanje ekonomske aktivnosti, te povećanje nezaposlenosti. S tim u vezi, determinante poslovanja banke i to posebno profitabilnosti izložene su sve većoj pažnji ne samo akademske javnosti, već i kreatora politike, regulatornih i nadzornih institucija, te posebno rukovodstva banaka koji donose odluke o politici banke.

Teorija koja ispituje doprinos finansijskih institucija ekonomskom rastu nastavlja da se razvija u cilju analiziranja karakteristika koje moraju imati banke da bi obezbedile dobru ulogu u finansijskom sistemu. Usluge koje pružaju banke će stvoriti šire otvaranje privrede smanjenjem rizika ulaganja i transakcija, te povećavanjem operativne efikasnosti pružanjem dobrih informacija zainteresovanim stranama. Dakle, uloga banke mora biti dobro definisana kako bi postala jedan od motora ekonomskog rasta (Yudistira i Ike, 2014).

Bankarski sektor omogućava prikupljanje sredstava i štednje potrebnih za ekonomski rast, te pojavu novih inicijativa u većini sektora. Povećanje štednje pozitivno utiče na akumulaciju kapitala obezbeđujući privredni rast, te otvaranje novih radnih mesta putem kreditnog mehanizma. Nekoliko studija pokušava da ispita značaj finansijskog sektora u kontekstu ekonomskog rasta. Osnovna uloga finansijskog sistema je stvaranje likvidnosti i uspostavljanje povoljnog i efikasnog platnog sistema. Dakle, finansijski sektor je danas najznačajniji pokretač koji doprinosi ekonomskom rastu.

U ovoj studiji, zemlje regiona, poput Bosne i Hercegovine, Srbije i Hrvatske biće istražene. Posmatrane zemlje su relativno homogene i geografski bliske. Takođe, one imaju slične institucije i ekonomije, i njihovi bankarski sektori imaju važne zajedničke karakteristike. Određeni makroekonomski i bankarski indikatori su dati u tabeli 1.

Tabela 1: *Određeni makroekonomski i bankarski pokazatelji posmatranih zemalja za period: 2012-2020. god.*

Zemlja	Naziv pokazatelja	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bosna i Hercegovina	Stopa rasta realnog BDP (godišnje u %)	-0,8	2,3	1,1	3,0	3,1	3,1	3,7	2,8	-3,1
	Domaći krediti realnom sektoru (% BDP)	61,7	60,8	60,2	58,6	57,8	58,3	57,5	57,9	58,4
Srbija	Stopa rasta realnog BDP (godišnje, u %)	-0,6	2,8	-1,5	1,8	3,3	2,1	4,5	4,3	-0,9
	Domaći krediti realnom sektoru (% BDP)	46,5	40,9	40,7	40,6	40,8	40,2	41,4	41,9	45,5
Hrvatska	Stopa rasta realnog BDP (godišnje, u %)	-2,2	-0,3	-0,3	2,5	3,5	3,4	2,9	3,4	-8,0
	Domaći krediti realnom sektoru (% BDP)	69,9	68,6	67,2	63,6	59,4	56,3	54,6	53,1	59,7

Izvor: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#>
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Lako se može primetiti da su, kako globalna finansijska kriza, tako i kriza izazvana COVID-19 uticale na negativne vrednosti BDP i to u 2012. godini nakon perioda oporavka ekonomske aktivnosti i u 2020. godini. Dakle, BDP svih posmatranih zemalja bio je negativan u posmatranim godinama. Počeo je da raste i da se stabilizuje od 2013. godine. Krediti privatnog sektora u ovim zemljama su bili veoma visoki, što znači da su posmatrane zemlje bile zavisne od bankarskih kredita. Dakle, osnovni cilj ovog istraživanja je da se ispita odnos između razvoja bankarskog sektora i ekonomskog rasta u Bosni i Hercegovini, Srbiji i Hrvatskoj. Ovde se ograničavamo na istraživanje bankarskog sektora zbog njegove dominacije u finansijskom sektoru.

Rad je strukturiran iz četiri dela. Prvi deo odnosi se na uvodna razmatranja. Drugi deo opisuje dosadašnja istraživanja u kontekstu uticaja indikatora profitabilnosti banaka na ekonomski rast, i obrnuto uticaja indikatora ekonomskog rasta na profitabilnost banaka. Treći deo opisuje izabranu metodologiju istraživanja. Četvrti deo elaborira dobijene rezultate istraživanja, kao i određena zapažanja i preporuke.

Pregled relevantne literature

Bankarski sektor je veoma važna komponenta finansijskog sistema. Banke stvaraju dodatno bogatstvo u privredi privlačeći sredstva od strane štediša i kanališući ta sredstva prema investitorima. Levine i Zervos (1998) sugerišu da banke podstiču ekonomski rast finansiranjem produktivnih projekata, te da su preduslov za ekonomski rast.

Ayadi i ostali (2010) istražuju posledice prisustva lokalnih zadružnih banaka na regionalni ekonomski rast, koristeći regionalne podatke za sedam evropskih zemalja od 2000. do 2008. godine. Oni tvrde da prisustvo zadružnih banaka ima značajan pozitivan uticaj na stope rasta u većini zemalja kroz kreditiranje malog i srednjeg biznisa, i da je efekat znatno jači u siromašnijim regionima. Takođe, ovi autori pokazuju da su pored koegzistiranja sa drugim bankama pod sličnim uslovima kooperativne banke reagovala na promene u tržišnim kretanjima, istovremeno ispunjavajući integralnu ulogu doprinosa stabilnosti i regionalnom rastu u svojim privredama.

Studija sprovedena od strane Gul i ostali (2011) ispitala je uticaj specifičnih i makroekonomskih faktora na profitabilnost poslovanja 15 najvećih palestinskih banaka tokom perioda 2005-2009. god. U istraživanju su koristili objedinjenu metodu procene najmanjih kvadrata da bi istražili uticaj imovine, kredita, kapitala, depozita, ekonomskog rasta, inflacije i tržišne kapitalizacije na glavne pokazatelje profitabilnosti, tj, prinos na uloženi kapital (ROE) i neto kamatnu marginu (NIM). Empirijski rezultati su pokazali da postoje jaki dokazi da unutrašnji i eksterni faktori imaju snažan uticaj na profitabilnost poslovanja banaka.

Tan i Floros (2012) pokušali su da istraže odnos između profitabilnosti banaka i ekonomskog rasta za period od 2003. do 2009. godine, koristeći uzorak od 101 kineske banke. Primena generalizovane metode momenata dala je dokaze u prilog činjenici da postoji negativna veza između rasta BDP i profitabilnosti banaka merenih kao ROA i NIM.

Awdeh (2012) je proučavao pravac uzročnosti između razvoja bankarskog sektora i ekonomskog rasta u Libanu tokom perioda 1992-2011. god., te pronašao jednosmernu uzročnost koja se proteže od ekonomskog rasta do mera bankarskog sektora, kao što su rast depozita i krediti lokalnom privatnom sektoru.

Trujillo-Ponce (2013) ističe da je profitabilnost banaka takođe od suštinskog značaja za održivost bankarskog sistema, te da su profitabilne banke u mogućnosti da ubrizgavaju sredstva u privredu davanjem kredita. Petkouski i Kjosevski (2014) su ispitivali vezu između razvoja bankarskog sektora i ekonomskog rasta u 16 tranzicionih ekonomija iz Centralne i Jugoistočne Evrope, i pokazali su da su krediti privatnom sektoru i kamatne margine negativno povezani sa ekonomskim rastom.

Javid (2016) je ispitivao interne (specifične) i eksterne (makroekonomske) determinante profitabilnosti banaka za period: 2006 – 2013. god. Koristeći uzorak od 34 komercijalne banke koje posluju u Pakistanu, indikator ROA je korišćen kao indikator profitabilnosti banke, dok su veličina banke, depoziti, likvidnost, nekamatni prihod, godišnja stopa inflacije, stopa rasta BDP i realna kamatna stopa razmatrani kao nezavisne varijable. Rezultati regresione analize panel podataka su pokazali da su veličina banke i nekamatni prihodi imali pozitivan uticaj na profitabilnost banke, dok su depoziti imali negativan uticaj. Takođe, uočeno je da makroekonomski pokazatelji nisu imali uticaja na profitabilnost banke.

Klein i Weill (2017) koristili su globalne podatke da bi istražili uticaj profitabilnosti banaka na ekonomski rast. S obzirom da banke širom sveta posluju po različitim politikama i propisima, nalazi njihove studije ne mogu se generalizovati na azijsko-pacifički region. Takođe, istraživali su uzročno-posledičnu vezu između profitabilnosti banaka i ekonomskog rasta, i identifikovali su da uticaj profitabilnosti banaka varira u različitim ekonomijama.

Alev (2018) je ispitao dugoročnu vezu između profitabilnosti banaka i ekonomskog rasta turskih banaka primenom klasične Engle Granger kointegracije i Grendžerovog testa uzročnosti tokom perioda 1992-2017. god. U istraživanju je stopa rasta BDP uzeta kao varijabla rasta, dok su ROA i ROE korišćeni kao indikatori profitabilnosti banaka. Empirijski rezultati su pokazali da profitabilnost banaka, odnosno indikatori ROA i ROE pozitivno utiču na privredni rast.

Moussa i Hdidar (2019) su koristili model analize panel podataka da istraže odnos između profitabilnosti banaka i ekonomskog rasta na uzorku od ukupno 18 tuniskih banaka u periodu od 2000. do 2017. godine. ROA i ROE su posmatrani kao indikatori profitabilnosti banaka, dok su nekoliko indikatora specifičnih za bankarsko poslovanje, zatim stopa rasta BDP-a, i stopa inflacije korišćene kao nezavisne promenljive. Kao rezultat istraživanja, oni su zaključili da postoji pozitivna veza između ekonomskog rasta i profitabilnosti banaka.

Metodologija i regresioni model

U ovom istraživanju ekonomski rast i profitabilnost procenjeni su u okviru regresione analize sa VAR ocenom za kvartalne podatke tri odabrane zemlje (Bosna i Hercegovina, Srbija i Hrvatska) i za period 2008 – 2020. god. U ovoj studiji stopa realnog rasta BDP se koristi kao varijabla ekonomskog rasta, a prinos na aktivu (ROA) kao i prinos na vlasničku glavnici se koriste kao indikatori profitabilnosti banaka. Podaci korišćeni u ovoj studiji su dobijeni od strane Centralne banke BiH, Narodne banke Srbije, Narodne banke Hrvatske, Agencije za statistiku u BiH, Republičkog zavoda za statistiku Republike Srbije, Državnog zavoda za statistiku Republike Hrvatske i Međunarodnog monetarnog fonda. Pored toga, programski paket STATA 13.1 je korišćen za dobijanje rezultata procene u studiji. Ekonometrijski modeli procenjeni u ovoj studiji su sledeći:

$$ROA_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \mu_{it} \quad (1)$$

$$ROE_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \mu_{it} \quad (2)$$

Jednačina (1) i (2) pokazuje uticaj privrednog rasta na profitabilnost banaka. Dok β_0 izražava konstantan član, β_1 – označava koeficijent nagiba GDP-a, a $\mu_{i,t}$ je slučajna greška u modelu. Na sličan način efekat uticaja profitabilnosti banaka na privredni rast je modeliran na sledeći način:

$$GDP_{i,t} = \alpha_0 + \alpha_1 ROA_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$GDP_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \varepsilon_{i,t} \quad (4)$$

Dok se β_0 u modelu 3 i 4 odnosi na konstantan član, β_1 odnosi se na koeficijent nagiba ROA i ROE, $\varepsilon_{i,t}$ – je slučajna greška u modelu 3 i 4. U oba modela i , ($i=1,2,\dots,N$) predstavlja veličinu podataka poprečnog preseka varijabli, a t ($t=1,2,\dots,T$) predstavlja dimenziju vremenske serije.

U ovom istraživanju biće istražena uzročna veza između varijabli ROA, ROE i BDP. Prije svega biće primenjen Dumitrescu – Hurlin (2012) test uzročnosti koji je razvio tradicionalni Granger (1969) model, koji se koristi u vremenskim serijama i usvojio ga za panelne modele podataka. Da bi se ovaj test mogao primeniti serija mora biti stacionirana na istom nivou.

Rezultati istraživanja

Sumarna statistika obuhvaćena ovim istraživanjem uključena je u tabeli 2.

Tabela 2: Rezultati deskriptivne statistike za period: 2008:Q1- 2020:Q4

Zemlja	Varijabla	Broj posmatranja	Srednja vrednost	Std, Dev,	Minimalna vrednost	Maksimalna vrednost
Bosna i Hercegovina	BDP	52	-0,10961	3,393145	-9,3	4,4
	ROA	52	0,84423	0,648804	-0,60	2,0
	ROE	52	6,07692	4,589229	-5,5	13,6
Srbija	BDP	52	2,02884	2,878135	-4,2	8,8
	ROA	52	1,45961	0,59779	-0,07	2,77
	ROE	52	7,26346	3,02948	-0,36	12,72
Hrvatska	BDP	52	-0,00576	2,49975	-14,2	4,0
	ROA	52	1,11731	0,65670	-1,5	2,0
	ROE	52	8,03846	4,76923	-10,9	14,5

Izvor: Proračun autora

Najveću srednju vrednost stope rasta povrata na vlasnički kapital je ostvarila Hrvatska (8,04), zatim Srbija (7,26) i Bosna i Hercegovina (6,08). Takođe, i standardna devijacija kao prva mera volatilnosti je sledila isti obrazac u kretanju. Ovako visoke srednje vrednosti stope rasta povrata na vlasnički kapital su direktna posledica porasta troškova i povećanih odbitaka od tekućih prihoda da bi se pokrili gubici po kreditima u 2010. godini (Plakalović i Alihodžić, 2015). Kada je u pitanju ekonomska aktivnost za posmatrani period najveću srednju vrednost je ostvarila Srbija od oko 2,03. Tabela u nastavku teksta ilustruje rezultate testa jediničnog korena.

Tabela 3: Rezultati Diki-Fulerovog testa jediničnog korena za zemlje:
Bosna i Hercegovina, Srbija i Hrvatska 2012-2020. god.

Naziv serije	Nivo		Prva diferencija	
	Probability (P) vrednost	Vrednost t- statistike	Probability (P) vrednost	Vrednost t- statistike
BDP	0,000	-5,612	0,000	-15,638
ROA	0,000	-5,816	0,0001	-4,896
ROE	0,000	-5,521	0,000	-11,019

Izvor: Proračun autora

Iz prethodne tabele se da zaključiti da su sve serije stacionarne, nultog reda integrisanosti. Pod stacioniranošću podataka podrazumeva se situacija gde su statističke osobine indikatora kao što su aritmetička sredina, varijansa i ostali konstantni tokom vremena. U toku ocene modela jako je bitno da se koriste stacionarne serije jer se na taj način jednostavnije vrši prognoza na osnovu modela.

Tabela 4 ilustruje rezultate multivarijantne vremenske serije (vektorske autoregresije) – VAR na slučaju Bosne i Hercegovine za period: 2008 – 2020. god.

Tabela 4: Multivarijantna vremenska serija - vektorska autoregresija - VAR - slučaj Bosna i Hercegovina

		Koeficijent	Standardna greška	t	P> t	[95% Interval poverenja]	
GDP	GDP						
	L1.	-0,3241	0,16697	-1,94	0,059	-0,66165	0,01328
	L2.	-0,04122	0,15912	-0,26	0,797	-0,36280	0,28037
	ROA						
	L1.	15,779	5,989	2,63	0,012	3,6739	27,884
	L2.	4,559	6,289	0,72	0,473	-8,151	17,271
	ROE						
	L1.	-2,155	0,836	-2,58	0,014	-3,846	-0,4646
	L2.	-0,572	0,883	-0,65	0,521	-2,358	1,2135
	_cons	-0,7760	1,021	-0,76	0,452	-2,8412	1,2891
ROA							
ROA	GDP						
	L1.	-0,02131	0,0352	-0,60	0,549	-0,0925	0,04996
	L2.	0,0045	0,0336	0,14	0,892	-0,0633	0,07251
	ROA						
	L1.	2,1009	1,2652	1,66	0,105	-0,4560	4,6579
	L2.	0,2386	1,3284	0,18	0,858	-2,4462	2,9235
	ROE						
	L1.	-0,2906	0,1767	-1,64	0,108	-0,6478	0,0665
	L2.	-0,0168	0,1866	-0,09	0,928	-0,3941	0,3603
	_cons	0,7997	0,21583	3,71	0,001	0,36356	1,2360
ROE							
ROE	GDP						
	L1.	-0,1529	0,253	-0,61	0,548	-0,6639	0,3579
	L2.	0,0701	0,240	0,29	0,773	-0,4167	0,5570
	ROA						
	L1.	13,914	9,068	1,53	0,133	-4,415	32,242
	L2.	2,0956	9,522	0,22	0,827	-17,14	21,341
	ROE						
	L1.	-1,913	1,266	-1,51	0,139	-4,473	0,6473
	L2.	-0,203	1,338	-0,15	0,880	-2,907	2,5011
	_cons	5,8213	1,547	3,76	0,001	2,694	8,948

Izvor: Proračun autora

Napomena: Relacija L1. i L2. se odnose na linearne podprostore primenjene VAR metodologije za ocenu linearne regresije.

Prema tabeli 4 rezultati primenjene VAR metodologije za ocenu linearne regresije prema linearnim podprostorima L1 i L2 razlikuju se između indikatora ekonomske aktivnosti i profitabilnosti banaka u BiH. Najveća pozitivna vrednost koeficijenta prema linearnom podprostoru L1 je ostvarena između bruto domaćeg proizvoda i indikatora menadžerske efikasnosti banaka, tj. povrata na aktivu (15,779), i između povrata na vlasničku glavnica i povrata na aktivu (13,914). S druge strane, najveće vrednosti bazirane prema linearnom podprostoru L2 su ostvarene takođe između indikatora ekonomske

aktivnosti tj. bruto domaćeg proizvoda i povrata na aktivu (4,559), kao i između indikatora povrata na vlasničku glavnica i povrata na aktivu (2,095).

Uzročna veza između varijabli utvrđenih u skladu sa podacima korišćenih u ovom istraživanju analizirani su u skladu sa Dumitrescu-Hurlin (2012) testom uzročnosti. U cilju utvrđivanja koja od ovih veza postoji, ovo istraživanje pokušava da analizira odnos između ekonomskog rasta i profitabilnosti banaka korišćenjem Grendžerovog testa uzročnosti. Rezultati Grendžer testa uzročnosti su prikazani u tabeli 9.

Tabela 5 ilustruje rezultate multivarijantne vremenske serije (vektorske autoregresije) – VAR na slučaju Srbije za period: 2008 – 2020.

Tabela 5: Multivarijantna vremenska serija - vektorska autoregresija - VAR - slučaj Srbija

		Koeficije nt	Standardna greška	t	P> t	[95% Interval poverenja]	
GDP	GDP						
	L1.	0,211287	0,2054	1,03	0,316	-0,21711	0,63969
	L2.	0,396636	0,2147	1,85	0,080	-0,05139	0,84466
	L3.	0,224328	0,3079	-0,73	0,475	0,86670	0,41804
	L4.	0,898001	0,1970	-4,56	0,000	-1,30905	-0,48694
	L5.	0,092549	0,2476	0,43	0,675	-0,36148	0,54658
	L6.	0,291953	0,2476	1,18	0,252	0,224648	0,80855
	ROA						
	L1.	-10,1781	3,5967	-2,83	0,010	-17,6807	-2,6754
	L2.	6,3131	4,4096	1,43	0,168	-2,8852	15,5114
	L3.	5,4881	4,7725	1,15	0,264	-4,4673	15,4436
	L4.	-6,6012	3,6249	-1,82	0,084	-14,162	0,96033
	L5.	-5,7061	3,8231	-1,49	0,151	-13,681	2,26868
	L6.	-4,3807	3,7962	-1,15	0,262	-12,299	3,53808
	ROE						
	L1.	1,70668	0,6830	2,50	0,021	0,28194	3,131
	L2.	-1,21689	0,8402	-1,45	0,163	-2,96969	0,535
	L3.	-0,96163	0,9102	-1,06	0,303	-2,86034	0,937
	L4.	1,64508	0,7665	2,15	0,044	0,04606	3,244
	L5.	1,20273	0,8204	1,47	0,158	-0,50860	2,914
L6.	0,73156	0,8330	0,88	0,390	-1,00607	2,469	
	_cons	2,10246	1,40843	1,49	0,151	-0,83546	5,0403
ROA							
	GDP						
	L1.	0,05109	0,0725	0,70	0,489	-0,10022	0,20241
	L2.	0,05960	0,0758	0,79	0,441	-0,09864	0,21785
	L3.	-0,14614	0,1087	-1,34	0,194	-0,37304	0,08074
	L4.	-0,13154	0,0696	-1,89	0,073	-0,27673	0,01364
	L5.	0,06125	0,0768	0,80	0,435	-0,09911	0,22162
	L6.	0,09655	0,0874	1,10	0,283	-0,08592	0,27902

	ROA						
	L1.	-1,20981	1,27041	-0,95	0,352	-3,8598	1,44022
	L2.	0,89378	1,5575	0,57	0,572	-2,3552	4,14275
	L3.	0,30010	1,6857	0,18	0,860	-3,2163	3,81651
	L4.	-0,85250	1,2803	-0,67	0,513	-3,5233	1,81833
	L5.	-0,76809	1,35037	-0,57	0,576	-3,5849	2,04873
	L6.	-1,11445	1,34088	-0,83	0,416	-3,91148	1,68256
	ROE						
	L1.	0,17268	0,2412	0,72	0,482	-0,33055	0,67592
	L2.	-0,14308	0,29679	-0,48	0,635	-0,76220	0,47602
	L3.	0,03011	0,32150	0,09	0,926	-0,64053	0,70076
	L4.	0,28875	0,27076	1,07	0,299	-0,27604	0,85355
	L5.	0,11140	0,28977	0,38	0,705	-0,49305	0,71587
	L6.	0,18233	0,29423	0,62	0,542	-0,43142	0,79608
	_cons	0,94365	0,49747	1,90	0,072	-0,09406	1,98137
ROE							
	GDP						
	L1.	0,274122	0,36775	0,75	0,465	-0,493005	1,04125
	L2.	0,288748	0,38460	0,75	0,462	-0,513514	1,09101
	L3.	-0,744095	0,55143	-1,35	0,192	-1,894368	0,40617
	L4.	-0,746305	0,35286	-2,12	0,047	-1,482364	-0,01024
	L5.	0,424919	0,38975	1,09	0,289	-0,388102	1,23794
	L6.	0,526236	0,44346	1,19	0,249	-0,3988195	1,45129
	ROA						
	L1.	-6,38502	6,4405	-0,99	0,333	-19,81967	7,04962
	L2.	5,61798	7,89612	0,71	0,485	-10,85303	22,089
	L3.	1,03447	8,54607	0,12	0,905	-16,7923	18,861
	L4.	-3,307004	6,49106	-0,51	0,616	-16,8471	10,233
	L5.	-3,845851	6,84586	-0,56	0,581	-18,12607	10,434
	L6.	-3,552876	6,79773	-0,52	0,607	-17,73271	10,626
	ROE						
	L1.	0,987003	1,22304	0,81	0,429	-1,56422	3,538226
	L2.	-0,875980	1,50465	-0,58	0,567	-4,01464	2,26268
	L3.	0,1851068	1,629905	0,11	0,911	-3,214816	3,585029
	L4.	1,256572	1,372655	0,92	0,371	-1,606735	4,11988
	L5.	0,477339	1,469065	0,32	0,749	-2,587077	3,541755
	L6.	0,398714	1,49164	0,27	0,792	-2,712793	3,510222
	_cons	5,244699	2,522006	2,08	0,051	-0,0161139	10,50551

Izvor: Proračun autora

Prema tabeli 5 rezultati primenjene VAR metodologije za ocenu linearne regresije prema linearnim podprostorima L1 i L6 razlikuju se između indikatora ekonomske aktivnosti i profitabilnosti banaka u Srbiji. Najveća pozitivna vrednost koeficijenata prema linearnom podprostoru L2 je ostvarena između bruto domaćeg proizvoda i indikatora menadžerske efikasnosti banaka, tj. povrata na aktivu (6,313),

te prema linearnom podprostoru L2 je ostvarena između povrata na vlasničku glavnica i povrata na aktivu (5,617).

Tabela 6 ilustruje rezultate multivarijantne vremenske serije (vektorske autoregresije) – VAR na slučaju Hrvatske za period: 2008 – 2020. god.

Tabela 6: Multivarijantna vremenska serija - vektorska autoregresija - VAR - slučaj Hrvatska

		Koeficijent	Standardna greška	t	P> t	[95% Interval poverenja]	
GDP	GDP						
	L1.	-0,16553	0,14053	-1,18	0,246	-0,44955	0,11848
	L2.	-0,01533	0,1411	-0,11	0,914	-0,3006	0,26993
	ROA						
	L1.	-11,464	5,683	-2,02	0,050	-22,95197	0,02323
	L2.	19,502	7,397	2,64	0,012	4,55234	34,4523
	ROE						
	L1.	1,50384	0,7845	1,92	0,062	-0,08188	3,08957
	L2.	-2,69004	1,0047	-2,68	0,011	-4,720802	-0,65928
	_cons	0,488332	0,87108	0,56	0,578	-1,272201	2,248866
ROA							
ROA	GDP						
	L1.	-0,04675	0,04074	-1,15	0,258	-0,12909	0,035586
	L2.	0,03195	0,04092	0,78	0,439	-0,05074	0,114661
	ROA						
	L1.	0,55178	1,6478	0,33	0,739	-2,77858	3,882147
	L2.	-2,03242	2,1444	-0,95	0,349	-6,36656	2,30173
	ROE						
	L1.	-0,08875	0,22746	-0,39	0,698	-0,54847	0,370959
	L2.	0,25003	0,29129	0,86	0,396	-0,33870	0,838767
	_cons	1,46067	0,25253	5,78	0,000	0,950277	1,97106
ROE							
ROE	GDP						
	L1	-0,36602	0,29175	-1,25	0,217	-0,95567	0,22363
	L2.	0,20630	0,29304	0,70	0,486	-0,38596	0,79857
	ROA						
	L1.	4,76921	11,8005	0,40	0,688	-19,08055	28,61899
	L2.	-12,6231	15,3572	-0,82	0,416	-43,66135	18,41498
	ROE						
	L1.	-0,78943	1,62892	-0,48	0,631	-4,08162	2,502753
	L2.	1,50566	2,08607	0,72	0,475	-2,71045	5,72177
	_cons	10,920	1,8084	6,04	0,000	7,26535	14,57555

Izvor: Proračun autora

Prema tabeli 6 rezultati primenjene VAR metodologije za ocenu linearne regresije prema linearnim podprostorima L1 i L2 razlikuju se između indikatora ekonomske aktivnosti i profitabilnosti banaka

u Hrvatskoj. Najveća pozitivna vrednost koeficijenta prema linearnom podprostoru L2 je ostvarena između bruto domaćeg proizvoda i indikatora menadžerske efikasnosti banaka, tj. povrata na aktivu (19,502), te prema linearnom podprostoru L1 najjača pozitivna veza je ostvarena između povrata na vlasničku glavnica i povrata na aktivu (4,769).

Tabela 7 ilustruje rezultate multivarijantne vremenske serije (vektorske autoregresije) – VAR na slučaju Bosne i Hercegovine, Srbije i Hrvatske za period: 2008 – 2020. god.

Tabela 7 : Multivarijantna vremenska serija - vektorska autoregresija - VAR - slučaj Bosna i Hercegovina, Srbija i Hrvatska

		Koeficijent	Standardna greška	t	P> t	[95% Interval poverenja]	
GDP	GDP						
	L1.	0,0142	0,0976	0,15	0,884	-0,1771	0,20567
	L2.	-0,0750	0,0931	-0,81	0,420	-0,2575	0,10752
	ROA						
	L1.	-2,5296	0,9113	-2,78	0,006	-4,3159	-0,74344
	L2.	2,6571	0,9190	2,89	0,004	0,8557	4,45850
	ROE						
	L1.	0,36940	0,1362	2,71	0,007	0,10242	0,63638
	L2.	-0,36692	0,1375	-2,67	0,008	-0,6364	-0,09737
	_cons	0,52614	0,48209	1,09	0,275	-0,41874	1,47104
ROA							
ROE	GDP						
	L1.	-0,0490	0,0274	-1,79	0,074	-0,10284	0,00480
	L2.	0,0126	0,0261	0,48	0,629	-0,03867	0,06398
	ROA						
	L1.	0,32671	0,2562	1,27	0,202	-0,1755	0,82895
	L2.	0,25911	0,2584	1,00	0,316	-0,2473	0,7656
	ROE						
	L1.	-0,0112	0,0383	-0,29	0,768	-0,0863	0,06377
	L2.	-0,0481	0,0386	-1,25	0,213	-0,12398	0,02759
	_cons	0,9169	0,1355	6,76	0,000	0,65126	1,18261
ROE							
ROE	GDP						
	L1	-0,3532	0,1747	-2,02	0,043	-0,6956	-0,01071
	L2.	0,1001	0,1666	0,60	0,548	-0,2264	0,42675
	ROA						
	L1.	1,8756	1,6305	1,15	0,250	-1,3201	5,0715
	L2.	-0,3038	1,6443	-0,18	0,853	-3,5267	2,9190
	ROE						
	L1.	0,0450	0,2437	0,18	0,853	-0,4326	0,5227
	L2.	-0,0963	0,2460	-0,39	0,695	-0,5786	0,38590
	_cons	5,84998	0,86254	6,78	0,000	4,1594	7,54053

Izvor: Proračun autora

Prema tabeli 7 rezultati primenjene VAR metodologije za ocenu linearne regresije prema linearnim podprostorima L1 i L2 razlikuju se između indikatora ekonomske aktivnosti i profitabilnosti banaka za sve tri posmatrane zemlje (Bosna i Hercegovina, Srbija i Hrvatska). Najveća pozitivna vrednost koeficijenta prema linearnom podprostoru L2 je ostvarena između bruto domaćeg proizvoda i indikatora menadžerske efikasnosti banaka, tj. povrata na aktivu (2,657), te prema linearnom podprostoru L1 najjača pozitivna veza je ostvarena između povrata na vlasničku glavnica i povrata na aktivu (1,875).

U statistici se Breusch-Paganov test koji su 1979. godine razvili Trevor Breusch i Adrian Pagan koristi za testiranje heteroskedastičnosti u modelu linearne regresije. Ako testna statistika ima p-vrednost ispod odgovarajućeg praga (na primer $p < 5\%$) tada se nulta hipoteza homoskedastičnosti odbacuje i pretpostavlja se heteroskedastičnost. Ako Breusch-Pagan test pokazuje da postoji uslovna heteroskedastičnost može se koristiti ili ponderisani najmanji kvadrat (ako je izvor heteroskedastičnosti poznat) ili standardna pogreška dosledne heteroskedastičnosti. Tabela u nastavku teksta prikazuje dobijene rezultate Breusch i Pagan Lagrangian multiplier testa između random efekt modela i modela fiksnih efekata.

Dobijeni rezultati pokazuju da model fiksnih efekata bolje objašnjava uticaj nezavisnih varijabli na zavisnu varijablu, odnosno stopu rasta bruto domaćeg proizvoda u odnosu na random efekt model. S obzirom da je p-vrednost veća od 5% onda se prihvata nulta hipoteza, odnosno model fiksnih efekata koji bolje objašnjava uticaj nezavisnih na zavisnu promenljivu i pretpostavlja se homoskedastičnost.

Tabela 8: Rezultati Breusch i Pagan Lagrangian multiplier testa

Procenjeni rezultati	Var	Sd=sqrt(Var)
GDP	6,604149	2,569854
e	5,098638	2,258016
u	0	0

Test: $\text{Var}(u) = 0$

Chibar2(01) = 0.00

Prob>chibar2 = 1.0000

Grendžerova kauzalnost predstavlja putanju testa uzročnosti između dve posmatrane varijable za niz vremenskih serija. Dakle, metoda je probabilistički kalkulator uzročnosti koji koristi empirijske podatke da bi se pronašao određeni oblik korelacije. Na primer, ako posmatramo dve varijable X i Y, i ako promenljiva X može da utiče na predviđanje promenljive Y onda Grendžer može da izazove Y i obrnuto. Ako promenljiva Y može uticati na predvidivost promenljive X onda dolazimo do zaključka da Y Grendžer uzrokuje X. U ovom slučaju se radi o dvostrukoj uzročnosti. S druge strane, ako samo jedna od varijabli uzrokuje drugu varijablu, a ne obrnuto onda je to jednostruka uzročnost. Tabela 9 prikazuje dobijene rezultate Grendžerove kauzalnosti primenom Wald testa između varijabli GDP, ROA i ROE za period: 2008 – 2020. god.

Tabela 9: Rezultati Grendžer kauzalnosti Wald testa za BiH, Srbiju i Hrvatsku za period: 2008 – 2020. god.

Zemlja	Equation	Excluded	F	df	df_r	Prob>F
BiH	GDP	ROA	4,3762	2	40	0,0191
	GDP	ROE	4,0168	2	40	0,0257
	GDP	ALL	2,3947	4	40	0,0664
	ROA	GDP	0,21543	2	40	0,8071
	ROA	ROE	1,4425	2	40	0,2484
	ROA	ALL	0,77943	4	40	0,5452
	ROE	GDP	0,26868	2	40	0,7658
	ROE	ROA	1,3432	2	40	0,2725
	ROE	ALL	0,71962	4	40	0,5836
Srbija	GDP	ROA	2,8052	6	20	0,0380
	GDP	ROE	2,4611	6	20	0,0602
	GDP	ALL	1,6056	12	20	0,1686
	ROA	GDP	0,78242	6	20	0,5936
	ROA	ROE	0,45814	6	20	0,8308
	ROA	ALL	0,81659	12	20	0,6328
	ROE	GDP	1,0057	6	20	0,4490
	ROE	ROA	0,42822	6	20	0,8514
	ROE	ALL	0,85215	12	20	0,6023
Hrvatska	GDP	ROA	5,0538	2	40	0,0110
	GDP	ROE	5,0761	2	40	0,0108
	GDP	ALL	3,24	4	40	0,0215
	ROA	GDP	1,2824	2	40	0,2695
	ROA	ROE	0,4225	2	40	0,6583
	ROA	ALL	0,86462	4	40	0,4935
	ROE	GDP	1,3552	2	40	0,2695
	ROE	ROA	0,39168	2	40	0,6785
	ROE	ALL	0,87476	4	40	0,4876

Izvor: Proračun autora

Rezultati istraživanja su pokazali za Bosnu i Hercegovinu da postoji jednostrana kauzalnost između indikatora profitabilnosti i ekonomskog rasta merenog preko realnog BDP. Sposobnost banaka da uspešno funkcionišu u velikoj meri zavisi od nivoa njihove profitabilnosti, gde se može očekivati da banke sa željenim nivoom profitabilnosti mogu imati pozitivan efekat na privredni rast. Dakle, indikator profitabilnosti banaka, tj. povrat na aktivu utiče na privredni rast meren preko realnog BDP. Različita teorijska i empirijska istraživanja su potvrdila da finansijski razvoj može imati pozitivan uticaj na privredni rast (Guiso, i ostali, 2004). Odnos između bankarskog sektora i ekonomskog rasta je izuzetno važan za sve zemlje, gde pravac ili stepen ovog odnosa može varirati. U nekim slučajevima se

navodi da razvoj bankarskog sektora izaziva rast, a u drugim slučajevima rast izaziva razvoj bankarskog sektora. Takođe, rezultati istraživanja su pokazali za Srbiju da postoji jednostrana kauzalnost između prvog indikatora profitabilnosti (povrat na aktivu - ROA) i ekonomskog rasta merenog preko realnog BDP. Isto tako, rezultati istraživanja za Hrvatsku su pokazali da postoji jednostrana kauzalnost između prvog i drugog indikatora profitabilnosti (povrat na aktivu - ROA i povrat na vlasničku glavnica - ROE) sa indikatorom ekonomskog rasta izraženog preko realnog BDP-a. Dakle, ovo znači da visok nivo učinaka banaka preko performansi banaka utiče na promociju ekonomskog razvoja, u skladu sa nalazima Ayadi i ostali. (2010) i Yudistira i Ike (2014). Profitabilne banke su ključni pokretači ekonomskog rasta. Rezultati istraživanja sugerišu pozitivnu vezu između profitabilnosti banaka i privrednog rasta. Dakle, rezultati istraživanja sugerišu da se sa povećanjem profitabilnosti banaka povećava i ekonomski rast. Takođe, ovi rezultati pokazuju da tržišta sa većim prisustvom banaka imaju značajno veću stopu rasta. To dalje znači da kooperativne banke imaju značajan tržišni udeo u kreditiranju malih i srednjih preduzeća koje se često prepoznaju kao pokretači ekonomskog razvoja i to posebno u tranzicionim ekonomijama.

Zaključak

Ovo istraživanje analizira uticaj banaka pojedinih zemalja Zapadnog Balkana na realni ekonomski rast. Takođe, se razmatra kroz empirijsko istraživanje odnos između indikatora poslovanja banaka i rasta realnog BDP-a. Dakle, ovo istraživanje imalo je za cilj da proceni uzročno-posledičnu vezu između profitabilnosti banaka i ekonomskog rasta sa skupom podataka od tri odabrane zemlje koje pokrivaju Bosnu i Hercegovinu, Srbiju i Hrvatsku u periodu od 2008 do 2020. godine. Uzimajući u obzir nekoliko zapažanja i kritika iznesenih u literaturi ovo istraživanje pruža nove uvide u vezu između profitabilnosti banaka i ekonomskog rasta.

Rezultati uzročnosti dati po zemljama potvrđuju tezu da postoji jednosmerna uzročnost koja se kreće od profitabilnosti banaka do privrednog rasta. Dobijeni empirijski rezultati potvrđuju argument da trenutni obrazac profitabilnosti banaka potiče ekonomski rast u odabranim zemljama u razvoju (Bosna i Hercegovina, Srbija i Hrvatska). Dakle, rezultati istraživanja sugerišu da postoji pozitivna veza i korelacija između profitabilnosti banaka i privrednog rasta.

Ovo istraživanje može da predstavlja dobru osnovu za buduća istraživanja. Buduća istraživanja bi mogla obuhvatiti uticaj finansijskih pokazatelja poput bankovnih plasmana, bankovnih depozita na privredni rast sledeći sličnu empirijsku metodu. Takođe, duži vremenski horizont kao i različita metodologija mogli bi proizvesti različite rezultate.

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DOES BANK PROFITABILITY AFFECT ECONOMIC GROWTH: EXAMPLES OF BANKS IN SOME WESTERN BALKAN COUNTRIES

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Summary

Banks play an important role in a country's economy because increasing savings and capital accumulation has a positive effect on economic growth and employment through the banks' resource transfer function. The purpose of this study is to establish a cause-and-effect relationship between bank profitability and economic growth in three selected countries, including Bosnia and Herzegovina, Serbia, and Croatia. In this research, a panel causality test is applied to examine the cause-and-effect relationship for the time period from the first quarter of 2008 to the fourth quarter of 2020. Empirical findings in this study showed that the profitability of banks in selected developing countries (Bosnia and Herzegovina, Serbia and Croatia) has a positive effect on economic growth. Also, this research provides insight into in-depth analysis in terms of considering several countries through the use of a panel causality test, for the purpose of studying the relationship between bank profitability and economic growth.

Keywords: Economic growth; bank profitability; Granger causality.

JEL classification: G21, O43, C23

Introduction

Banks play a central role in the functioning of economic activity. In addition, a healthy banking system is of great importance for sustainable economic development. The banking sector fulfils an important economic function in providing financial intermediation and economic momentum by converting deposits into productive investments. In this context, banks are important financiers and are important for the stability of the banking sector (Menicucci ve Paolucci, 2016). Both external and country-specific factors affect the structure and performance of the banking sector. A healthy and profitable banking sector increases banks' resilience to negative shocks and contributes to the stability of the financial system. Observed in terms of the economic crisis of 2007-2008., it has been shown that negativity in the banking sector can destabilize the financial system, turning it into a systematic risk, causing a slowdown in economic activity and rising unemployment. In this regard, the determinants of the banks' operations, especially profitability, are receiving increasing attention not only from the academic public, but also from policy makers, regulatory and supervisory institutions, and especially bank management who make decisions on bank policy.

The theory examining the contribution of financial institutions to economic growth continues to evolve in order to analyze the characteristics that banks must have in order to ensure a good role in the financial system. The services provided by banks will create a wider opening of the economy by reducing the risk of investments and transactions and increasing operational efficiency by providing good information to stakeholders. Therefore, the role of the bank must be well defined in order to become one of the engines of economic growth (Yudistira i Ike, 2014).

The banking sector enables the collection of funds and savings needed for economic growth, as well as the emergence of new initiatives in most sectors. Increasing savings has a positive effect on the accumulation of capital by ensuring economic growth and job creation through the credit mechanism.

Several studies attempt to examine the importance of the financial sector in terms of economic growth. The main role of the financial system is to create liquidity and establish a favorable and efficient payment system. Therefore, the financial sector is today the most important driver contributing to economic growth.

In this study, countries in the region, such as Bosnia and Herzegovina, Serbia, and Croatia will be investigated. The observed countries are relatively homogeneous and geographically close. They also have similar institutions and economies, and their banking sectors have important common features. Certain macroeconomic and banking indicators are given in Table 1.

Table 1: *Certain Macroeconomic and Banking Indicators of the Observed Countries for the Period: 2012-2020*

Country	Indicators	2012	2013	2014	2015	2016	2017	2018	2019	2020
Bosnia and Herzegovina	Real GDP growth rate (annually, in%)	-0.8	2.3	1.1	3.0	3.1	3.1	3.7	2.8	-3.1
	Domestic loans to the real sector (% of GDP)	61.7	60.8	60.2	58.6	57.8	58.3	57.5	57.9	58.4
Serbia	Real GDP growth rate (annually, in%)	-0.6	2.8	-1.5	1.8	3.3	2.1	4.5	4.3	-0.9
	Domestic loans to the real sector (% of GDP)	46.5	40.9	40.7	40.6	40.8	40.2	41.4	41.9	45.5
Croatia	Real GDP growth rate (annually, in%)	-2.2	-0.3	-0.3	2.5	3.5	3.4	2.9	3.4	-8.0
	Domestic loans to the real sector (% of GDP)	69.9	68.6	67.2	63.6	59.4	56.3	54.6	53.1	59.7

Source: <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators#> (Accessed: 02.03.2022)

It is easy to see that both the global financial crisis and the crisis caused by COVID-19 affected the negative values of GDP in 2012 after the recovery period of economic activity in 2020. Therefore, the GDP of all observed countries was negative in the observed years. It has started to grow and stabilize since 2013. Private sector loans in these countries were very high, which means that the observed countries were dependent on bank loans. Therefore, the main goal of this research is to examine the relationship between the development of the banking sector and economic growth in Bosnia and Herzegovina, Serbia, and Croatia. Here we limit ourselves to researching the banking sector due to its dominance in the financial sector.

The paper is structured in four parts. The first part deals with introductory considerations. The second part describes previous research in terms of the impact of bank profitability indicators on economic growth, and vice versa, the impact of economic growth indicators on bank profitability. The third part describes the chosen research methodology. The fourth part elaborates the obtained research results, as well as certain observations and recommendations.

Review of Relevant Literature

The banking sector is a very important component of the financial system. Banks create additional wealth in the economy by attracting funds from savers and channeling those funds to investors. Levine and Zervos (1998) suggest that banks stimulate economic growth by financing productive projects, and that they are a prerequisite for economic growth.

Ayadi et al. (2010) investigate the implications of the presence of local cooperative banks on regional economic growth, using regional data for seven European countries from 2000 to 2008. They argue that the presence of cooperative banks has a significant positive impact on growth rates in most countries, through lending to small and medium-sized businesses, and that the effect is much stronger in poorer regions. Also, these authors show that, in addition to coexisting with other banks

under similar conditions, cooperative banks reacted to changes in market trends, while fulfilling the integral role of contributing to stability and regional growth in their economies.

A study conducted by Gul et al. (2011) examined the impact of specific and macroeconomic factors on the profitability of the 15 largest Palestinian banks during the period 2005-2009. In the research, they used a unified method of estimating the smallest squares to investigate the impact of assets, loans, capital, deposits, economic growth, inflation and market capitalization on the main indicators of profitability, i.e., return on invested capital (ROE) and net interest margin (NIM). Empirical results have shown that there is strong evidence that internal and external factors have a strong impact on banks profitability.

Tan and Floros (2012) tried to investigate the relationship between bank profitability and economic growth for the period from 2003 to 2009, using a sample of 101 Chinese banks. The application of the generalized method of moments provided evidence in favor of the fact that there is a negative link between GDP growth and the profitability of banks measured as ROA and NIM.

Awdeh (2012) studied the causal direction between banking sector development and economic growth in Lebanon during the period 1992-2011, and found a one-way causality that extends from economic growth to banking sector measures such as deposit growth and lending to the local private sector.

Trujillo-Ponce (2013) points out that the profitability of banks is also essential for the sustainability of the banking system, and that profitable banks are able to inject funds into the economy by lending. Petkouski and Kjosevski (2014) examined the relationship between banking sector development and economic growth in 16 transition economies in Central and Southeast Europe, and showed that private sector loans and interest margins are negatively associated with economic growth.

Javid (2016) examined internal (specific) and external (macroeconomic) determinants of bank profitability for the period: 2006-2013. Using a sample of 34 commercial banks operating in Pakistan, the ROA indicator was used as an indicator of bank profitability, while bank size, deposits, liquidity, non-interest income, annual inflation rate, GDP growth rate and real interest rate considered as independent variables. The results of the regression analysis of the panel data showed that the size of the bank and non-interest income had a positive impact on the banks profitability, while deposits had a negative impact. It was also noted that macroeconomic indicators did not affect the banks profitability.

Klein and Weill (2017) used global data to investigate the impact of bank profitability on economic growth. Given that banks around the world operate under different policies and regulations, the findings of their study cannot be generalized to the Asia-Pacific region. They also investigated the cause-and-effect relationship between bank profitability and economic growth, and identified that the impact of bank profitability varies across economies.

Alev (2018) examined the long-term relationship between bank profitability and economic growth of Turkish banks by applying the classic Engle Granger cointegration and the Granger causality test during the period 1992-2017. In the research, the GDP growth rate was taken as a growth variable, while ROA and ROE were used as indicators of bank profitability. Empirical results have shown that the profitability of banks, i.e., ROA and ROE indicators have a positive effect on economic growth.

Moussa and Hdidar (2019) used a panel data analysis model to investigate the relationship between

bank profitability and economic growth on a sample of a total of 18 Tunisian banks between 2000 and 2017. The ROA and ROE were viewed as indicators of bank profitability, while several indicators specific to banking operations, then GDP growth rate, and inflation rate were used as independent variables. As a result of the research, they concluded that there is a positive link between economic growth and bank profitability.

Methodology and the Regression Model

In this research, economic growth and profitability were assessed as part of a regression analysis with VAR score for quarterly data of three selected countries (Bosnia and Herzegovina, Serbia, and Croatia) and for the period 2008-2020. In this study, the real GDP growth rate is used as a variable of economic growth, and the return on assets (ROA) as well as the return on equity are used as indicators of banks profitability. The data used in this study were obtained from the Central Bank of B&H, the National Bank of Serbia, the National Bank of Croatia, the Agency for Statistics in B&H, the Republic Statistical Office of the Republic of Serbia, the Central Bureau of Statistics, and the International Monetary Fund. In addition, the STATA 13.1 software package was used to obtain the evaluation results in the study. The econometric models evaluated in this study are as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \mu_{it} \quad (1)$$

$$ROE_{i,t} = \beta_0 + \beta_1 GDP_{i,t} + \mu_{it} \quad (2)$$

Equation (1) and (2) show the impact of economic growth on bank profitability. With β_0 expressing a constant term, β_1 denotes the slope coefficient of GDP, and $\mu_{i,t}$ is a random error in the model. In a similar way, the effect of banks profitability on economic growth is modeled as follows:

$$GDP_{i,t} = \alpha_0 + \alpha_1 ROA_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$GDP_{i,t} = \alpha_0 + \alpha_1 ROE_{i,t} + \varepsilon_{i,t} \quad (4)$$

While α_0 in models 3 and 4 refers to the constant term, α_1 refers to the slope coefficient ROA and ROE, $\varepsilon_{i,t}$ is a random error in models 3 and 4. In both models i , ($i = 1, 2 \dots N$) represents the data size of the cross section of the variables, at ($t = 1, 2, \dots, T$) represents the dimension of the time series.

This study will investigate the causal relationship between the variables ROA, ROE and GDP. First of all, the Dumitrescu - Hurlin (2012) causality test developed by the traditional Granger (1969) model, which is used in time series and adopted for panel data models, will be applied. In order for this test to be applicable the series must be stationned at the same level.

Research Results

The summary statistics covered by this survey are included in Table 2.

Table 2: Results of Descriptive Statistics for the Period: 2008: Q1-2020: Q4

Country	Variable	Obs	Mean	Std. Dev.	Min	Max
Bosnia and Herzegovina	BDP	52	-0.10961	3.393145	-9.3	4.4
	ROA	52	0.84423	0.648804	-0.60	2.0
	ROE	52	6.07692	4.589229	-5.5	13.6
Serbia	BDP	52	2.02884	2.878135	-4.2	8.8
	ROA	52	1.45961	0.59779	-0.07	2.77
	ROE	52	7.26346	3.02948	-0.36	12.72
Croatia	BDP	52	-0.00576	2.49975	-14.2	4.0
	ROA	52	1.11731	0.65670	-1.5	2.0
	ROE	52	8.03846	4.76923	-10.9	14.5

Source: Calculation by the author

The highest average value of the growth rate of return on equity was achieved by Croatia (8.04), followed by Serbia (7.26) and Bosnia and Herzegovina (6.08). Also, the standard deviation as the first measure of volatility followed the same pattern in movement. Such high average growth rates of return on equity are a direct consequence of rising costs and increased deductions from current income to cover loan losses in 2010 (Plakalović and Alihodžić, 2015). When observing economic activity for the observed period, the highest average value was achieved by Serbia of around 2.03. The table below illustrates the results of the unit root test.

Table 3: Results of the Dickie-Fuller Unit Root Test for Countries: Bosnia and Herzegovina, Serbia, and Croatia

Series name	Level		The first difference	
	Probability (P) value	The value of t-statistics	Probability (P) value	The value of t-statistics
BDP	0.000	-5.612	0.000	-15.638
ROA	0.000	-5.816	0.0001	-4.896
ROE	0.000	-5.521	0.000	-11.019

Source: Calculation by the author

From the previous table, it can be concluded that all series are stationary, with zero order of integration. Stationing of data means a situation where the statistical properties of indicators such as arithmetic mean, variance and others are constant over time. During the evaluation of the model, it is very important to use stationary series, because in that way it is easier to make a forecast based on the model.

Table 4: Multivariate Time Series - Vector Autoregression - VAR - Case Bosnia and Herzegovina

		Coefficient	Standard error	t	P> t	[95%Confidence interval]	
GDP	GDP						
	L1.	-0.3241	0.16697	-1.94	0.059	-0.66165	0.01328
	L2.	-0.04122	0.15912	-0.26	0.797	-0.36280	0.28037
	ROA						
	L1.	15.779	5.989	2.63	0.012	3.6739	27.884
	L2.	4.559	6.289	0.72	0.473	-8.151	17.271
	ROE						
	L1.	-2.155	0.836	-2.58	0.014	-3.846	-0.4646
	L2.	-0.572	0.883	-0.65	0.521	-2.358	1.2135
	_cons	-0.7760	1.021	-0.76	0.452	-2.8412	1.2891
ROA	GDP						
	L1.	-0.02131	0.0352	-0.60	0.549	-0.0925	0.04996
	L2.	0.0045	0.0336	0.14	0.892	-0.0633	0.07251
	ROA						
	L1.	2.1009	1.2652	1.66	0.105	-0.4560	4.6579
	L2.	0.2386	1.3284	0.18	0.858	-2.4462	2.9235
	ROE						
	L1.	-0.2906	0.1767	-1.64	0.108	-0.6478	0.0665
	L2.	-0.0168	0.1866	-0.09	0.928	-0.3941	0.3603
	_cons	0.7997	0.21583	3.71	0.001	0.36356	1.2360
ROE	GDP						
	L1.	-0.1529	0.253	-0.61	0.548	-0.6639	0.3579
	L2.	0.0701	0.240	0.29	0.773	-0.4167	0.5570
	ROA						
	L1.	13.914	9.068	1.53	0.133	-4.415	32.242
	L2.	2.0956	9.522	0.22	0.827	-17.14	21.341
	ROE						
	L1.	-1.913	1.266	-1.51	0.139	-4.473	0.6473
	L2.	-0.203	1.338	-0.15	0.880	-2.907	2.5011
	_cons	5.8213	1.547	3.76	0.001	2.694	8.948

Source: Calculation by the author

Note: Relation L1, and L2, refer to the linear subspaces of the applied VAR methodology for estimating linear regression.

According to Table 4, the results of the applied VAR methodology for estimating the linear regression according to the linear subspaces L1 and L2 differ between the indicators of economic activity and profitability of banks in B&H. The highest positive value of the coefficient according to the linear subspace L1 was achieved between the gross domestic product and the indicator of managerial efficiency of banks, i.e., return on assets (15.779), and between return on equity and return on assets (13.914). On the other hand, the highest values based on the linear subspace L2 were also achieved between the indicators of economic activity, i.e., gross domestic product and return on assets (4.559), as well as between the indicators of return on equity and return on assets (2.095).

The causal relationship between the variables determined according to the data used in this study was analyzed according to the Dumitrescu-Hurlin (2012) causality test. In order to determine which of these links exists, this study attempts to analyze the relationship between economic growth and bank profitability using Granger causality test. The results of the Granger causality test are shown in Table 9.

Table 5 illustrates the results of the multivariate time series (vector autoregression) - VAR in the case of Serbia for the period: 2008 - 2020.

		Coefficient	Standard error	t	P> t	[95% Confidence interval]	
GDP	GDP						
	L1.	0.211287	0.2054	1.03	0.316	-0.21711	0.63969
	L2.	0.396636	0.2147	1.85	0.080	-0.05139	0.84466
	L3.	-0.224328	0.3079	-0.73	0.475	-0.86670	0.41804
	L4.	-0.898001	0.1970	-4.56	0.000	-1.30905	-0.48694
	L5.	0.092549	0.2476	0.43	0.675	-0.36148	0.54658
	L6.	0.291953	0.2476	1.18	0.252	-0.224648	0.80855
	ROA						
	L1.	-10.1781	3.5967	-2.83	0.010	-17.6807	-2.6754
	L2.	6.3131	4.4096	1.43	0.168	-2.8852	15.5114
	L3.	5.4881	4.7725	1.15	0.264	-4.4673	15.4436
	L4.	-6.6012	3.6249	-1.82	0.084	-14.162	0.96033
	L5.	-5.7061	3.8231	-1.49	0.151	-13.681	2.26868
	L6.	-4.3807	3.7962	-1.15	0.262	-12.299	3.53808
	ROE						
	L1.	1.70668	0.6830	2.50	0.021	0.28194	3.131
	L2.	-1.21689	0.8402	-1.45	0.163	-2.96969	0.535
	L3.	-0.96163	0.9102	-1.06	0.303	-2.86034	0.937
	L4.	1.64508	0.7665	2.15	0.044	0.04606	3.244
	L5.	1.20273	0.8204	1.47	0.158	-0.50860	2.914
L6.	0.73156	0.8330	0.88	0.390	-1.00607	2.469	
cons		2.10246	1.40843	1.49	0.151	-0.83546	5.0403
ROA	GDP						
	L1.	0.05109	0.0725	0.70	0.489	-0.10022	0.20241
	L2.	0.05960	0.0758	0.79	0.441	-0.09864	0.21785
	L3.	-0.14614	0.1087	-1.34	0.194	-0.37304	0.08074
	L4.	-0.13154	0.0696	-1.89	0.073	-0.27673	0.01364
	L5.	0.06125	0.0768	0.80	0.435	-0.09911	0.22162
	L6.	0.09655	0.0874	1.10	0.283	-0.08592	0.27902
	ROA						
	L1.	-1.20981	1.27041	-0.95	0.352	-3.8598	1.44022
	L2.	0.89378	1.5575	0.57	0.572	-2.3552	4.14275
	L3.	0.30010	1.6857	0.18	0.860	-3.2163	3.81651
	L4.	-0.85250	1.2803	-0.67	0.513	-3.5233	1.81833
	L5.	-0.76809	1.35037	-0.57	0.576	-3.5849	2.04873
	L6.	-1.11445	1.34088	-0.83	0.416	-3.91148	1.68256
ROE							
L1.	0.17268	0.2412	0.72	0.482	-0.33055	0.67592	

	L2.	-0.14308	0.29679	-0.48	0.635	-0.76220	0.47602
	L3.	0.03011	0.32150	0.09	0.926	-0.64053	0.70076
	L4.	0.28875	0.27076	1.07	0.299	-0.27604	0.85355
	L5.	0.11140	0.28977	0.38	0.705	-0.49305	0.71587
	L6.	0.18233	0.29423	0.62	0.542	-0.43142	0.79608
	cons	0.94365	0.49747	1.90	0.072	-0.09406	1.98137
ROE							
	GDP						
	L1.	0.274122	0.36775	0.75	0.465	-0.493005	1.04125
	L2.	0.288748	0.38460	0.75	0.462	-0.513514	1.09101
	L3.	-0.744095	0.55143	-1.35	0.192	-1.894368	0.40617
	L4.	-0.746305	0.35286	-2.12	0.047	-1.482364	-0.01024
	L5.	0.424919	0.38975	1.09	0.289	-0.388102	1.23794
	L6.	0.526236	0.44346	1.19	0.249	-0.3988195	1.45129
	ROA						
	L1.	-6.38502	6.4405	-0.99	0.333	-19.81967	7.04962
	L2.	5.61798	7.89612	0.71	0.485	-10.85303	22.089
	L3.	1.03447	8.54607	0.12	0.905	-16.7923	18.861
	L4.	-3.307004	6.49106	-0.51	0.616	-16.8471	10.233
	L5.	-3.845851	6.84586	-0.56	0.581	-18.12607	10.434
	L6.	-3.552876	6.79773	-0.52	0.607	-17.73271	10.626
	ROE						
	L1.	0.987003	1.22304	0.81	0.429	-1.56422	3.538226
	L2.	-0.875980	1.50465	-0.58	0.567	-4.01464	2.26268
	L3.	0.1851068	1.629905	0.11	0.911	-3.214816	3.585029
	L4.	1.256572	1.372655	0.92	0.371	-1.606735	4.11988
	L5.	0.477339	1.469065	0.32	0.749	-2.587077	3.541755
	L6.	0.398714	1.49164	0.27	0.792	-2.712793	3.510222
	cons	5.244699	2.522006	2.08	0.051	-0.0161139	10.50551

Source: Calculation by the author

According to Table 5 the results of the applied VAR methodology for estimating the linear regression according to the linear subspaces L1 and L6 differ between the indicators of economic activity and profitability of banks in Serbia. The highest positive value of the coefficient according to the linear subspace L2 was achieved between the gross domestic product and the indicator of managerial efficiency of banks, i.e., return on assets (6.313), and according to the linear subspace L2 was realized between return on equity and return on assets (5.617).

Table 6 illustrates the results of the multivariate time series (vector autoregression) - VAR in the case of Croatia for the period: 2008 - 2020.

Table 6: *Multivariate Time Series - Vector Autoregression - VAR - Case Croatia*

		Coefficient	Standard error	t	P> t	[95% Confidence interval]	
GDP	GDP						
	L1.	-0.16553	0.14053	-1.18	0.246	-0.44955	0.11848
	L2.	-0.01533	0.1411	-0.11	0.914	-0.3006	0.26993
	ROA						
	L1.	-11.464	5.683	-2.02	0.050	-22.95197	0.02323
	L2.	19.502	7.397	2.64	0.012	4.55234	34.4523
	ROE						
	L1.	1.50384	0.7845	1.92	0.062	-0.08188	3.08957
	L2.	-2.69004	1.0047	-2.68	0.011	-4.720802	-0.65928
	_cons	0.488332	0.87108	0.56	0.578	-1.272201	2.248866
ROA							
ROA	GDP						
	L1.	-0.04675	0.04074	-1.15	0.258	-0.12909	0.035586
	L2.	0.03195	0.04092	0.78	0.439	-0.05074	0.114661
	ROA						
	L1.	0.55178	1.6478	0.33	0.739	-2.77858	3.882147
	L2.	-2.03242	2.1444	-0.95	0.349	-6.36656	2.30173
	ROE						
	L1.	-0.08875	0.22746	-0.39	0.698	-0.54847	0.370959
	L2.	0.25003	0.29129	0.86	0.396	-0.33870	0.838767
	_cons	1.46067	0.25253	5.78	0.000	0.950277	1.97106
ROE							
ROE	GDP						
	L1	-0.36602	0.29175	-1.25	0.217	-0.95567	0.22363
	L2.	0.20630	0.29304	0.70	0.486	-0.38596	0.79857
	ROA						
	L1.	4.76921	11.8005	0.40	0.688	-19.08055	28.61899
	L2.	-12.6231	15.3572	-0.82	0.416	-43.66135	18.41498
	ROE						
	L1.	-0.78943	1.62892	-0.48	0.631	-4.08162	2.502753
	L2.	1.50566	2.08607	0.72	0.475	-2.71045	5.72177
	_cons	10.920	1.8084	6.04	0.000	7.26535	14.57555

Source: Calculation by the author

According to Table 6, the results of the applied VAR methodology for estimating the linear regression according to the linear subspaces L1 and L2 differ between the indicators of economic activity and profitability of banks in Croatia. The highest positive value of the coefficient according to the linear subspace L2 was achieved between the gross domestic product and the indicator of managerial efficiency of banks, i.e., return on assets (19.502), and according to the linear subspace L1, the strongest positive relationship was achieved between return on equity and return on assets (4.769).

Table 7 illustrates the results of the multivariate time series (vector autoregression) - VAR in the case of Bosnia and Herzegovina, Serbia, and Croatia for the period: 2008 - 2020.

**Table 7: Multivariate Time Series - Vector Autoregression - VAR -
Case Bosnia and Herzegovina, Serbia and Croatia**

		Coefficient	Standard error	t	P> t	[95% Confidence interval]	
GDP	GDP						
	L1.	0.0142	0.0976	0.15	0.884	-0.1771	0.20567
	L2.	-0.0750	0.0931	-0.81	0.420	-0.2575	0.10752
	ROA						
	L1.	-2.5296	0.9113	-2.78	0.006	-4.3159	-0.74344
	L2.	2.6571	0.9190	2.89	0.004	0.8557	4.45850
	ROE						
	L1.	0.36940	0.1362	2.71	0.007	0.10242	0.63638
	L2.	-0.36692	0.1375	-2.67	0.008	-0.6364	-0.09737
	_cons	0.52614	0.48209	1.09	0.275	-0.41874	1.47104
ROA							
ROA	GDP						
	L1.	-0.0490	0.0274	-1.79	0.074	-0.10284	0.00480
	L2.	0.0126	0.0261	0.48	0.629	-0.03867	0.06398
	ROA						
	L1.	0.32671	0.2562	1.27	0.202	-0.1755	0.82895
	L2.	0.25911	0.2584	1.00	0.316	-0.2473	0.7656
	ROE						
	L1.	-0.0112	0.0383	-0.29	0.768	-0.0863	0.06377
	L2.	-0.0481	0.0386	-1.25	0.213	-0.12398	0.02759
	_cons	0.9169	0.1355	6.76	0.000	0.65126	1.18261
ROE							
ROE	GDP						
	L1.	-0.3532	0.1747	-2.02	0.043	-0.6956	-0.01071
	L2.	0.1001	0.1666	0.60	0.548	-0.2264	0.42675
	ROA						
	L1.	1.8756	1.6305	1.15	0.250	-1.3201	5.0715
	L2.	-0.3038	1.6443	-0.18	0.853	-3.5267	2.9190
	ROE						
	L1.	0.0450	0.2437	0.18	0.853	-0.4326	0.5227
	L2.	-0.0963	0.2460	-0.39	0.695	-0.5786	0.38590
	_cons	5.84998	0.86254	6.78	0.000	4.1594	7.54053

Source: Calculation by the author

According to Table 7, the results of the applied VAR methodology for estimating the linear regression according to the linear subspaces L1 and L2 differ between the indicators of economic activity and profitability of banks for all three observed countries (Bosnia and Herzegovina, Serbia, and Croatia). The highest positive value of the coefficient according to the linear subspace L2 was achieved between the gross domestic product and the indicator of managerial efficiency of banks, i.e., return on assets (2.657), and according to the linear subspace L1, the strongest positive relationship was achieved between return on equity and return on assets (1.875).

In statistics, the Breusch-Pagan test developed in 1979 by Trevor Breusch and Adrian Pagan is used to test heteroskedasticity in a linear regression model. If the test statistic has a p-value below the appropriate threshold (for example $p < 5\%$) then the null hypothesis of homoskedasticity is rejected and heteroskedasticity is assumed. If the Breusch-Pagan test shows that there is conditional heteroskedasticity, either a weighted least square can be used (if the source of heteroskedasticity is known) or the standard error of consistent heteroskedasticity can be used. The table below shows the results of the Breusch and Pagan Lagrangian multiplier tests between the random effect model and the fixed effect model.

The obtained results show that the model of fixed effects better explains the influence of independent variables on the dependent variable, i.e., the growth rate of gross domestic product in relation to the random effect model. Since the p-value is greater than 5%, then the null hypothesis is accepted, i.e., the model of fixed effects, which better explains the influence of independents on the dependent variable and homoskedasticity is assumed.

Table 8: *Breusch and Pagan Lagrangian multiplier test results*

Estimated results	Var	Sd=sqrt(Var)
GDP	6.604149	2.569854
e	5.098638	2.258016
u	0	0

Test: $\text{Var}(u)=0$

Chibar2(01)= 0.00

Prob>chibar2= 1.0000

Granger's causality represents the path of the causality test between two observed variables for a series of time series. Therefore, the method is a probabilistic causality calculator that uses empirical data to find a particular form of correlation. For example, if we look at two variables X and Y, and if the variable X can affect the prediction of the variable Y then Granger can cause Y and vice versa. If the variable Y can affect the predictability of the variable X then we come to the conclusion that Y Granger causes X. In this case, it is a matter of double causality. On the other hand, if only one of the variables causes the other variable and not the other way around then it is a single causality. Table 9 shows the obtained results of Granger causality using the Wald test between the variables GDP, ROA, and ROE for the period: 2008 - 2020.

Table 9: Results of the Granger Causality of the Wald Test for BiH, Serbia and Croatia for the Period:
2008 - 2020

Country	Equation	Excluded	F	df	df_r	Prob>F
Bosnia and Herzegovina	GDP	ROA	4.3762	2	40	0.0191
	GDP	ROE	4.0168	2	40	0.0257
	GDP	ALL	2.3947	4	40	0.0664
	ROA	GDP	0.21543	2	40	0.8071
	ROA	ROE	1.4425	2	40	0.2484
	ROA	ALL	0.77943	4	40	0.5452
	ROE	GDP	0.26868	2	40	0.7658
	ROE	ROA	1.3432	2	40	0.2725
Serbia	ROE	ALL	0.71962	4	40	0.5836
	GDP	ROA	2.8052	6	20	0.0380
	GDP	ROE	2.4611	6	20	0.0602
	GDP	ALL	1.6056	12	20	0.1686
	ROA	GDP	0.78242	6	20	0.5936
	ROA	ROE	0.45814	6	20	0.8308
	ROA	ALL	0.81659	12	20	0.6328
	ROE	GDP	1.0057	6	20	0.4490
Croatia	ROE	ROA	0.42822	6	20	0.8514
	ROE	ALL	0.85215	12	20	0.6023
	GDP	ROA	5.0538	2	40	0.0110
	GDP	ROE	5.0761	2	40	0.0108
	GDP	ALL	3.24	4	40	0.0215
	ROA	GDP	1.2824	2	40	0.2695
	ROA	ROE	0.4225	2	40	0.6583
	ROA	ALL	0.86462	4	40	0.4935
ROE	GDP	1.3552	2	40	0.2695	
ROE	ROA	0.39168	2	40	0.6785	
ROE	ALL	0.87476	4	40	0.4876	

Source: Calculation by the author

The results of the research showed for Bosnia and Herzegovina that there is a one-sided causality between the indicators of profitability and economic growth measured through real GDP. The ability of banks to function successfully depends largely on the level of their profitability, where it can be expected that banks with the desired level of profitability can have a positive effect on economic growth. Therefore, the indicator of bank profitability, i.e., return on assets affects economic growth measured in real GDP. Various theoretical and empirical studies have confirmed that financial development can have a positive impact on economic growth (Guiso, et al., 2004). The relationship between the banking sector and economic growth is extremely important for all countries, where the direction or degree of this relationship may vary. In some cases it is stated that the development of the banking sector causes growth, and in other cases the growth causes the development of the banking sector. Also, the results of the research showed for Serbia that there is a one-sided causality between the first indicator of profitability (return on assets - ROA) and economic growth measured over real GDP. Also, the survey results for Croatia showed that there is a one-sided causality between

the first and second profitability indicators (return on assets - ROA and return on equity - ROE) with the indicator of economic growth expressed in real GDP. Therefore, this means that a high level of bank performance through bank performance affects the promotion of economic development, in line with the findings of Ayadi et al. (2010) and Yudistira and Ike (2014). Profitable banks are key drivers of economic growth. The results of the research suggest a positive relationship between bank profitability and economic growth. Therefore, the research results suggest that with an increasing the profitability of banks affects the increase in economic growth. Also, these results show that markets with a higher bank presence have a significantly higher growth rate. This further means that cooperative banks have a significant market share in lending to small and medium-sized enterprises, which are often recognized as drivers of economic development, especially in transition economies.

Conclusion

This research analyzes the impact of banks in some Western Balkan countries on real economic growth. Also, the relationship between bank performance indicators and real GDP growth is considered through empirical research. Therefore, this research aimed to assess the cause-and-effect relationship between bank profitability and economic growth with a set of data from three selected countries covering Bosnia and Herzegovina, Serbia and Croatia in the period from 2008 to 2020. Taking into account several observations and critiques presented in the literature, this research provides new insights into the relationship between bank profitability and economic growth.

The results of causality given by countries confirm the thesis that there is a one-way causality ranging from bank profitability to economic growth. The obtained empirical results confirm the argument that the current pattern of bank profitability encourages economic growth in selected developing countries (Bosnia and Herzegovina, Serbia, and Croatia). Therefore, the results of the research suggest that there is a positive relationship and correlation between bank profitability and economic growth.

This research can be a good basis for future research. Future research could cover the impact of financial indicators such as bank placements, bank deposits on economic growth following a similar empirical method. Also, a longer time horizon as well as different methodologies could produce different results.

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