

# Ekonomski horizonti



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Sveska 3 Volumen 22 Godište 2020 naučnog časopisa *Ekonomski horizonti* sadrži četitri izvorna naučna i dva pregledna članka, Predmeti indeks članaka i Pregled autora i naslova svih priloga publikovanih u Časopisu, u 2020.

Polazeći od stava da strukturne promene direktno utiču na makroekonomsku i finansijsku stabilnost,

rast dohotka, produktivnost i ekonomsku efikasnost, poboljšanje kvaliteta života i socijalnu inkluziju, *Edvard Jakopin* ukazuje na to da će se najveće posledice globalne kontrakcije po privredu Republike Srbije, izazvane Covid-19, odraziti na usporavanje strukturnih reformi. Istraživanje je pokazalo da pozitivna privredna konjunktura, u periodu 2015-2019, nije doprinela očekivanim strukturnim promenama, budući da one nisu bile vođene istraživanjem i razvojem i inovacijama, kao pokretačima privrednog rasta. Dosadašnje strukturne reforme, bile su nedovoljne i spore, usled čega su stari problemi i dalje uzročnici niske konkurentnosti. Zbog toga je neophodno da se, u novim reformskim procesima, aktivnosti usmere na kreiranje podsticajnog ambijenta za razvoj domaćeg preduzetništva i rast privatnih investicija, kako bi se povećalo poverenje na relaciji preduzetništvo-institucije.

Na osnovu panel podataka za 13 zemalja ASEAN+3, za period 2008-2018, koautori *Cheng-Wen Lee* i *Andrian Dolfriandra Huruta* istražuju ulogu stranih direktnih investicija i izvoza za ekonomski rast. Na osnovu rezultata istraživanja, dobijenih primenom testa Lagranžovog množioca, pozivajući se na rezultate koje daje Valdov kao i Hausmanov i Čauov test, stav je da strane direktne investije, u slučaju zemalja ASEAN+3, pozitivno utiču na ekonomski rast. Istovremeno, budući da izvoz ima pozitivan i značajan uticaj na ekonomski rast, koautori potvrđuju hipotezu da su strane direktne investicije i izvoz značajni za podsticanje ekonomskog rasta zemalja ASEAN+3, zbog čega je ovaj region privlačna destinacija za međunarodne kompanije.

Ukazujući na to da ne postoji studija u kojoj se istražuje uticaj upravljanja zaradama na prinos na ukupnu imovinu i kapital preduzeća, koautori *Edesiri Gotsday Okoro* i *Confidence Joel Ihenyen* ovaj relevantan problem istražuju u studiji slučaja Podсахarske Afrike.

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Na osnovu podataka, prikupljenih iz baze podataka Berze zemalja Podсахarske Afrike, upotrebom statističke tehnike stalnih i nasumičnih efekata, koautori razvijaju model upravljanja zaradama koji uvažava specifičnosti Podсахarske Afrike. Na osnovu sprovedenih istraživanja, u studiji se ukazuje na to da, upravljanje zaradama vrši značajan pritisak na performanse preduzeća, kao i da veličina preduzeća igra važnu ulogu u posredovanju u vezi između upravljanja zaradama i performansi preduzeća koja posluju u Podсахarskoj Africi.

Shodno želji članova penzijskih fondova da se formira novčani iznos koji će, od momenta penzionisanja, biti dovoljan za isplatu zadovoljavajućeg iznosa penzija, autor *Stevan Luković* razmatra strategije za investiranje akumuliranih sredstava. Imajući u vidu rastuće i učestale fluktuacije na finansijskom tržištu, ukazuje se da statičke investicione strategije ne predstavljaju zadovoljavajuće rešenje za osiguranike. Na osnovu komparativne analize performansi dinamičkih i statičkih oblika strategije, korišćenjem *bootstrap* reuzorkovanja za simuliranje investicionih prinosa, autor zaključuje da dinamičke strategije životnog ciklusa generišu povoljnije finansijske rezultate u odnosu na statičke strategije životnog ciklusa, uz neznatno veću verovatnoću realizacije ekstremno nepovoljnih ishoda.

Polazeći od podatka da nivo siromaštva etničke manjine u Vijetnamu iznosi više od 70% nacionalne stope siromaštva, koautori *Luan Thanh Nguyen*, *Tuyen Quang Tran* i *Hang Minh Tran* istražuju doprinos strane pomoći društveno-ekonomskom razvoju etničkih manjina. Na bazi empirijskog istraživanja domaćinstava etničkih manjina, sprovedenog u devet

provincija ove zemlje, primenom regresionog modela običnih najmanjih kvadrata, na osnovu procene učinka strane pomoći na prihode domaćinstava, ukazuje se na različite efekte u pogledu veličine i značaja te pomoći unutar različitih etničkih grupa. Strana pomoć je značajno poboljšala egzistenciju stanovnika *Cham*-a i *Xtieng*-a, što nije slučaj sa stanovnicima *Hmong*-a, zbog čega je potrebno ponovno razmatranje pomoći i etničke politike.

Merenjem rizika pozajmljivanja malim i srednjim preduzećima (MSP), od strane banaka u Republici Srbiji, koautori *Mirela Mitrašević* i *Snežana Bardarova* nastoje da utvrde da li veća transparentnost u procesu merenja kreditnog rizika omogućava otkrivanje problema u upravljanju MSP i obezbeđenju izvora njihovog finansiranja. Na osnovu Altman-ovog Z-skor modela procene verovatnoće, da se preduzeća neće pridržavati ugovornih obaveza, zaključak je da je tim modelom moguće otkriti privredna društva koja će, možda, u periodu od dve godine nakon izvršene procene proglasiti stečaj, s jedne strane, ali da, s druge strane, ne može pomoću u proceni verovatnoće da će do stečaja i doći.

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Glavni i odgovorni urednik  
Vlastimir Leković

*Vlastimir Leković* je redovni profesor Ekonomskog fakulteta Univerziteta u Kragujevcu, u penziji. Doktorirao je na Ekonomskom fakultetu Univerziteta u Kragujevcu, iz naučne oblasti opšta ekonomija i privredni razvoj. Izvodi nastavu iz nastavnih disciplina Institucionalna ekonomija, na master, i Metodologija naučnog istraživanja i Politike tržišne regulative, na doktorskim studijama. Ključne oblasti njegovog naučnoistraživačkog interesovanja su ekonomski sistem, ekonomska politika i institucionalna ekonomija.

Izvorni naučni članak

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## EFEKTI STRUKTURNIH PROMENA U PRIVREDI REPUBLIKE SRBIJE: STARI PROBLEMI, NOVI REFORMSKI IZAZOVI

Edvard Jakopin\*

*Fakultet za ekonomiju i finansije, Univerzitet Union Nikola Tesla, Beograd*

Strukturne promene u privredi direktno utiču na makroekonomsku i finansijsku stabilnost, rast dohotka, produktivnost i ekonomsku efikasnost, poboljšanje kvaliteta života i socijalnu inkluziju. Globalna kontrakcija 2020, izazvana COVID-19, najdublja od Drugog svetskog rata, uzrokuje veliko globalno ekonomsko resetovanje, povećaće se ekstremno siromaštvo, a najveći trajni gubitak biće u ljudskom kapitalu. Najveće posledice po privredu Republike Srbije biće usporavanje strukturnih reformi. Ključne performanse poslovanja privrede u periodu konjunktura bile su pozitivne i uticale su na rast otpornosti privrednog sistema, ali je istraživanje pokazalo da su sprovedene strukturne reforme bile nedovoljne i spore, da su stari problemi i dalje uzročnici niske konkurentnosti. U kontekstu novih reformskih izazova, fokus aktivnosti neophodno je preusmeriti ka kreiranju podsticajnog ambijenta za razvoj domaćeg preduzetništva i rast privatnih investicija, kako bi se povećalo poverenje na relaciji preduzetništvo-institucije.

**Ključne reči:** makroekonomski i reformski bilans privrede, efekti strukturnih performansi privrede i prerađivačke industrije, kvalitativni pokazatelji, strukturni problemi, reformski izazovi

JEL Classification: L32, M21, O11, P11

### UVOD

Strukturne reforme i privredni oporavak Republike Srbije (RS) zaustavljeni su ekonomskim šokom izazvanim globalnom pandemijom 2020. Ekonomska recesija, najveća od Drugog svetskog rata, zahvatila je sve segmente javnog života širom sveta (IMF, 2020,

10-12). Fokus državnih ekonomskih intervencija bio je usmeren ka merama za podsticanje likvidnosti preduzeća (kako bi se izbegao bankrot i pružila podrška radnicima u ublažavanju gubitka prihoda), zaustavljanje porasta nezaposlenosti i izbegavanje finansijskog sloma. Stari strukturni problemi u privredi su eskalirali, a privreda se suočila sa novim izazovima.

Predmet istraživanja predstavljaju efekti strukturnih promena u privredi RS na privredni rast, dinamička

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strukturna analiza kvalitativnih performansi privrede u periodu konjunktura u poslednjih pet godina. Cilj istraživanja je da se, na osnovu kritičkog sagledavanja efekata ključnih strukturnih performansi poslovanja privrede, ukaže kreatorima ekonomske politike na reformsku "uska grla", kao i na neophodnost sprovođenja strukturnih reformi u onim oblastima privrede čiji segmenti konstantno prave gubitke i opterećuju ostatak privrede. Strukturna analiza, obuhvatila je sagledavanje performansi privrede po veličini, po vlasničkoj i tehnološkoj strukturi. Poseban analitički rakurs usmeren je ka prerađivačkoj industriji.

Istraživanje testira osnovne hipoteze, koje su proistekle iz samog cilja istraživanja:

H1: Privredna konjunktura nije doprinela očekivanim strukturnim promenama. Strukturne promene u određenim privrednim segmentima, dale su pozitivne rezultate i doprineli bržem privrednom rastu i makroekonomskoj stabilnosti.

H2: Poslovanje privatnog sektora je efikasnije od poslovanja državnog sektora, a u okviru njega, poslovanje preduzeća u većinskom stranom vlasništvu je efikasnije od poslovanja preduzeća koja su u većinskom domaćem vlasništvu.

U okviru osnovnih, testirane su izvedene hipoteze:

H11: U periodu konjunktura, poboljšane su kvalitativne performanse određenih privrednih struktura, u prvom redu profitabilnost, likvidnost i zaduženost.

H21: U okviru Prerađivačke industrije, poboljšana je tehnološka struktura u korist tehnološki intenzivnijih grana.

Metodološki instrumentarijum se bazirao na strukturnoj i dinamičkoj analizi ključnih pokazatelja ekonomsko-finansijske analize završnih računa privrednih društava u RS u periodu privredne konjunktura 2015-2019.

Osnovne koordinate istraživanja determinisale su strukturu rada. Rad se sastoji od tri međusobno povezane celine. U prvoj celini, dat je kratak teorijsko-

metodološki kontekst strukturnih promena, a druga sadrži, pored makroekonomskog i reformskog preseka, rezultate istraživanja kompleksne i sveobuhvatne strukturne analize privrede RS. U trećoj celini, analizirani su ključni (stari) problemi u privredi. U Zaključku, dati su reformski, strukturni izazovi i prioriteti privrede Republike Srbije.

## TEORIJSKO-METODOLOŠKI KONTEKST

Analiza efekata strukturnih promena u privredi obuhvata kvalitativne i kvantitativne transformacije privrede. U teorijskom kontekstu, osnovna metodološka karakteristika strukturne analize odnosi se na pojam "relativne strukturne nepromenljivosti" koji je od suštinskog značaja za određivanje skupa mogućih transformacija kroz koje može proći konkretni ekonomski sistem. „Relativna strukturna nepromenljivost“ omogućava proučavanje strukturnih promena kroz "vremenski diferencirani" opis međusobnih odnosa među elementima ekonomskog sistema (Schilirò, 2012, 20-21).

Strukturne promene privrede, u suštini, ukazuju na stepen kvalitativne transformacije privrednog sistema, koji je determinisan različitim faktorima, primarno tehnološkim inovacijama i promenama u organizacionoj strukturi. Strukturne promene u privredi predstavljaju generator jačanja makroekonomskih performansi i obezbeđivanja snažnog, održivog i uravnoteženog privrednog rasta (IMF, 2015, 6).

Trendovi, tokom poslednjih nekoliko decenija, sugerišu da su naponi na reformama često bili usko povezani sa makroekonomskim uslovima, fazama razvoja i globalnom integracijom. Strukturne reforme je, u osnovi, teško izmeriti, jer često uključuju politike ili pitanja koja nije lako kvantifikovati. Najjači zamah reformi, poklapao se sa periodima ekonomskog stresa ili turbulencija. Na ubrzanje strukturnih reformi, u nekoliko oblasti, utiču procesi ekonomskih integracija.

Svaka rasprava o makroekonomskoj politici posebno fokusira strukturne politike (IMF, 2014, 5-6). Kreatori politika su sve više usredsređeni na komplementarnu

ulogu strukturnih politika u promociji održivog i izbalansiranog rasta, koji obezbeđuje nova radna mesta.

Strukturne politike mogu uticati na makroekonomsku stabilnost na više načina (IMF, 2015, 12):

- sprečavanje efikasne alokacije resursa u privredi moglo bi doprineti stvaranju neravnoteža, na primer, prepreke konkurenciji i zaštita nerazmenljivog sektora mogu sprečiti razvoj razmenljivog sektora, ili, implikacije neadekvatne preraspodele dohotka uzrokuju ekonomske nejednakosti (Lekovic, 2015, 92) i dr;
- Limitiranje fleksibilnosti moglo bi sprečiti blagovremeno prilagođavanje šokovima i oslabiti otpornost privrede, na primer: rigidnost tržišta rada, recimo, u pogledu određivanja zarada, naknada za nezaposlenost ili otpremnine, može doprineti velikoj nezaposlenosti i niskom rastu produktivnosti. Slično tome, oslabljeni bilansi stanja privatnog sektora (sa problematičnim kreditima i prekomernim dugom) mogu sprečiti pozajmljivanje i ulaganje, ograničavajući prolazak lakših finansijskih uslova;
- ograničavanje potencijalnog rasta utiče na makroekonomsku stabilnost. Na primer, uska grla u investiranju, koja ograničavaju produktivnost i rast proizvodnje, mogu doprineti uvećanju duga, pogoršanim uslovima finansiranja i rastu nestabilnosti finansijskog sektora;
- stvaranje neravnoteže u zemlji članici ili grupi zemalja koje utiču na globalnu ekonomsku i finansijsku stabilnost.

Strukturne promene utiču na bazične makroekonomske ishode:

- dohotka, produktivnosti i ekonomske efikasnosti (Foster-McGregor & Verspagen, 2016, 92-93);
- promovisanje pravičnosti (reforma poreza i subvencija, socijalna potrošnja, rodna ravnopravnost);
- ekonomsku i finansijsku stabilnost (diverzifikacija izvoza, finansijski nadzor, režimi insolventnosti, upravljanje tokovima kapitala); i

- poboljšanje kvaliteta života (obrazovanje, zdravstvo, ekološka pitanja).

Snažniji teorijski uticaj strukturnih reformi na makroekonomske performanse počeo je zahuktavanjem tranzicionih procesa tokom 90-tih godina XX-og veka, kada su mnoge zemlje započele široke programe ekonomskih reformi, često inicirane pogoršanjem ekonomskih uslova (Drazen & Easterly, 2001). Globalna recesija 2008, i eskalacija spoljnog duga, dodatno je potencirala teorijski zamah značaja strukturnih reformi (Agnello, Castro, Jalles & Sousa, 2015, 134). Brojni teorijski radovi naglašavaju da ne postoji striktna povezanost između pokretača strukturnih reformi i njihove stvarne primene, da iskustvo svake zemlje odražava institucionalne karakteristike, istoriju i političke sisteme, interesne grupe (Haggard & Webb, 1993).

Postepeno je teorijski rakurs o strukturnim promenama usmeravan ka analizama privrednog rasta, kao i ka mikro analizama, koje jasnije objašnjavaju uzročnost.

Teorijska razmatranja, o pojedinačnim reformskim segmentima, uglavnom su fokusirana na reforme u finansijskom sektoru i njenim pozitivnim efektima (Galindo, Schiantarelli & Weiss, 2005, 87), spoljnotrgovinskoj liberalizaciji (Dollar & Kraay, 2004; Wacziarg & Welch, 2008; Estevadeordal & Taylor, 2013, 1669), investicionoj politici (Acemoglu, Johnson & Robinson, 2002; Bekaert, Harvey & Lundblad, 2005, 35, 37, 41). Naglašava se da efekti strukturnih promena zavise od dostignutog stepena razvoja neke države (Klein & Olivei, 2008, 862). Važan faktor dinamike strukturnih promena, dugoročno održivog rasta i investicija, predstavljaju institucije (Acemoglu *et al*, 2002), o čemu je u radu prikazan najnoviji reformski komparativni presek stanja u državama regiona. Da je fokus strukturnih promena usmeren na promene na mikro nivou i njihov značaj na produktivnost rada, pokazuju brojne studije (Bouis & Duval, 2011, 6, 8, 25).

Sve veći broj istraživanja usmeran je ka komplementarnosti strukturnih promena i značaja, takozvanog, talasa, snopa (višestrukih) strukturnih reformi na produktivnost rada (Christiansen,

Schindler & Tressel, 2013; Prati, Onorato & Papageorgiou, 2013, 947, 967).

Istraživanja o priritetima reformi su još u početnoj fazi. Na primer, trgovinske reforme imaju tendenciju da prethode domaćim finansijskim reformama (Hauner, Prati & Bircan, 2013, 896). U zavisnosti od privrednih ciklusa, neke strukturne reforme imaju jači efekat, a neke slabiji, recimo strukturne reforme na tržištu rada u periodu konjunktura daju jače efekte i manje troškove, nego u periodu recesije (Bouis & Duval, 2012, 15, 25).

Tranziciona reformska iskustva pokazuju da je određivanje prioriteta centralno pitanje za efikasnu primenu. Istraživanja pokazuju diferencirane prioritete u reformskim oblastima, u zavisnosti od stepena razvijenosti i faze razvoja države (Tabela 1). Ipak, pojavljuju se neki zajednički reformski prioritete tamo gde je verovatno da će biti šireg interesa širom članstva.

**Tabela 1** Prioriteti strukturnih reformi, u zavisnosti od stepena razvoja

REFORME	Nerazvijene države	Države u razvoju	Razvijene države
Tehnologija&Inovacije			
Industrija-Regulacija			
Tržište rada			
Regulacija poslovanja			
Fiskalne strukturne reforme			
Infrastruktura			
Bankarski sektor			
Ostalo tržište finansija i kapitala			
Pravni sistem&Pravo svojina			
Liberalizacija trgovine			
Poljoprivreda			

Napomena: Tamnija senka ukazuje da su reformska područja najčešće svrstana među tri glavna reformska prioriteta, u okviru svake grupe zemalja.

## MAKROEKONOMSKI I REFORMSKI BILANS REPUBLIKE SRBIJE U PERIODU PRIVREDNE KONJUNKTURE

Konjunktura na globalnom nivou, u periodu 2015-2018, doprinela je ubrzanju rasta, ali su se, već 2019, pojavili prvi signali usporavanja rasta. Globalni rast bruto domaćeg proizvoda (BDP) od 2,9% najniži je od globalne finansijske krize. Globalna stagnacija 2019, najviše je pogodila najrazvijenije ekonomije (SAD i Evrozonu), nešto manje azijske razvijene ekonomije, pre svega, zbog usporavanja industrijske proizvodnje usled slabije spoljne tražnje, trgovinskih tenzija i povećanja nesigurnosti u pogledu poverenja i ulaganja (World Bank, 2020). Ekonomije Evropske unije i Evrozone beležile su prosečan rast veći od 2%, sve do 2019 (osim Italije i Francuske), kada su se pojavili recesioni signali (prvo u Nemačkoj, zatim u Italiji i Francuskoj).

Države našeg regiona su, u konjunktornom periodu (2015-2019), imale prosečne stope privrednog rasta iznad 3%, (osim Hrvatske), najbrži rast je ostvarila Rumunija (5%), ali je, takođe, i kod njih primetno usporavanje rasta u 2019 (Tabela 2).

**Tabela 2** Regionalni privredni rast

	Prosečna stopa rasta BDP, u periodu 2015-2019.
Albanija	3,3
Bosna i Hercegovina	3,1
Bugarska	3,4
Mađarska	4,1
Rumunija	5,1
Severna Makedonija	2,3
Slovačka	2,8
Slovenija	3,6
Republika Srbija	3,5
Hrvatska	3,0
Crna Gora	4,1

Privredni rast RS je, u istom period, iznosio, kumulativno 14,6%, prosečna stopa 3,5% (Tabela 3). Zahvaljujući visokoj stopi privrednog rasta u 2019, od 4,2%, BDP RS je dostigao 45,9 milijardi evra.

Na osnovu trenda ključnih makroekonomskih agregata (Tabela 3), može se zaključiti:

- Iz ugla doprinosa rashodnih agregata privrednom rastu, investicije i lična potrošnja dali su najveći doprinos rastu. Investicije su povećavane prosečno za 11,5% godišnje, a lična potrošnja za 2,4%. U 2019, rast investicija od 15,6% i rast lične potrošnje od 3,1% uticali su da domaća tražnja doprinese rastu BDP-a sa 5,8%. Neto izvoz je imao negativan doprinos;
- Najvažniji efekat sprovedene fiskalne konsolidacije, u periodu 2015-2019, jeste smanjenje unutrašnjih i spoljnih makroekonomskih neravnoteža. Prvi put, od 2005, zabeležen je fiskalni suficit u 2017. (1,1% BDP), dok je 2019, registrovan skoro nulti fiskalni rezultat (-0,2% BDP). Deficit tekućeg računa platnog bilansa je povećan usled rasta spoljnotrgovinskog deficita, i iznosio je 3,2 milijarde evra (6,9% BDP-a);
- Strane direktne investicije (SDI) su dale doprinos makroekonomskoj stabilnosti - prosečan neto priliv SDI, u periodu 2015-2019, iznosio je 2,6 milijardi evra, što je obezbeđivalo pokrivenost deficita tekućeg računa platnog bilansa. Posebno je važan strukturni aspekt SDI, jer je priliv, uglavnom, bio usmeren u izvoznu prerađivačku industriju. Imajući u vidu razmere globalne recesije u 2020, za RS su bitni nalazi sprovedenih istraživanja o ponašanju SDI u recesionim periodima, koji pokazuju da se SDI u državama u razvoju ne razlikuje između kriznih i normalnih perioda (Alquist, Mukherjee & Tesar, 2016, 106, 112);
- Fiskalna disciplina i izbalansirane javne finansije doprinele su smanjenju javnog duga (sa 70% učešća javnog duga u BDP-u, u 2015, na 52% krajem 2019). Sličan pozitivan trend beleži i smanjenje učešća spoljnog duga;

**Tabela 3** Makroekonomski bilans 2015-2019.

	2015	2016	2017	2018	2019
BDP (mlrd. evra)	35,7	36,7	39,2	42,9	45,9
BDP (stope u%)	1,8	3,3	2,0	4,4	4,2
BDP/stanovniku u EUR	5.034	5.203	5.581	6.138	6.610
Prerađivačka industrija	5,7	6,0	6,3	1,9	0,2
Registrovana zaposlenost, ukupno (hilj.)	1.990	2.010	2.063	2.131	2.173
Neto zarade (realni rast, %)	-2,1	2,5	0,9	4,4	8,5
Bruto investicije (% BDP)	16,8	16,9	17,7	20,1	22,4
Izvoz robe i usluga (mlrd. evra)	15,7	17,4	19,3	21,2	23,4
Uvoz robe i usluga (mlrd. evra)	18,6	19,6	22,3	25,3	28,0
Tekući račun platnog bilansa (% BDP)	-3,5	-2,9	-5,2	-4,8	-6,9
Fiskalni deficit/suficit (% BDP)	-3,5	-1,2	1,1	0,6	-0,2
Javni dug (% BDP)	70,0	67,8	57,9	53,7	52,0
Spoljni dug (% BDP)	73,5	72,1	65,1	62,2	61,9
Inflacija (kraj perioda)	1,5	1,6	3,0	2,0	1,9

*Izvor:* Republički zavod za statistiku, 2020; Narodna banka Srbije, 2020; Ministarstvo Finansija, 2020.

- Pozitivni makroekonomski rezultati, u periodu 2015-2019, najviše su se odrazili na tržište rada. Povećan je broj zaposlenih, smanjena je stopa nezaposlenosti (sa 17,7%, u 2015, na 10,4% u 2019), a prosečan rast neto zarada 2015-2019, bio je 4,0%. Rast neto zarada u 2019, iznosio je 8,5%.

Zbog reformskog zaostatka u pojedinim oblastima, privreda RS je, prema Indeksu globalne konkurentnosti (*Global Competitiveness Index - GCI*) u 2019 (Tabela 4), nazadovala za 7 mesta u odnosu na

2018, i rangirana je na 72. mesto u svetu (od 141 države). Od tranzicionih država regiona, ispred RS se nalaze privrede Slovenije (35), Mađarske (47), Bugarske (49), Rumunije (51) i Hrvatske (65). Najproblematicniji od 12 stubova konkurentnosti, odnose se na: institucije, primenu IKT-a (Zecevic, Radovic Stojanovic & Cudan, 2019, 289), razvijenost finansijskog tržišta, zdravstvo i veličinu tržišta.

Strukturne reforme regulatornog okvira uslova poslovanja predstavljaju važan faktor investicionih

aktivnosti i privlačenja SDI. RS je u ovom segmentu postigla značajan napredak u periodu privrednog oporavka. Prema ompozitnom indeksu, Uslovi poslovanja Svetske banke za 2020 (*Doing business 2020*), RS je rangirana na 44. poziciju, od 190 država (Tabela 5). Najnepovoljniji rang RS beleži u oblasti dobijanja priključka za električnu energiju (94. pozicija), dobijanje kredita (pad sa 60. na 67), dok je najveće nazadovanje registrovano u domenu otpočinjanja poslovanja (pad za 33 pozicije).

**Tabela 4** Indeks globalne konkurentnosti za države regiona, u 2019.

Pokazatelji	ALB	BUG	MAĐ	RUM	SLO	HRV	SRBIJA		
							rang	vrednost	Udaljenost od lidera po vrednosti
GCI	81	49	47	51	35	63	72	60,9	24
Podindeks: PODRŽAVAJUĆE OKRUŽENJE									
1. stub: Institucije (20 ind.)	76	57	63	52	33	77	75	52,5	29
2. stub: Infrastruktura (12)	98	56	27	55	33	32	51	73,8	22
3. stub: Primena IKT-a (5)	75	30	54	32	40	60	77	52,6	40
4. stub: Makroekonomska stabilnost (2)	104	43	43	56	1	43	64	75,0	25
Podindeks: LJUDSKI KAPITAL									
5. stub: Zdravstvo (1)	46	81	70	83	36	47	76	79,0	21
Podindeks: TRŽIŠTE									
7. stub: Tržište dobara (8)	75	63	91	64	30	86	73	54,6	27
9. stub: Finansijsko tržište (9)	102	73	66	86	61	63	82	57,4	34
10. stub: Veličina tržišta (2)	111	64	48	41	82	78	74	51,8	48

Izvor: The Global Competitiveness Report, 2019

**Tabela 5** Uslovi poslovanja - najkritičniji faktori 2020.

Lakoća poslovanja - rang u svetu	Otpočinjanje poslovanja	Plaćanje poreza	Upis prava svojine	Dobijanje priključka za el. energiju	Dobijanje kredita	Izvršenje ugovora
44	73	85	58	94	67	65

Izvor: Doing Business Report, 2020

## EFEKTI STRUKTURNIH PROMENA

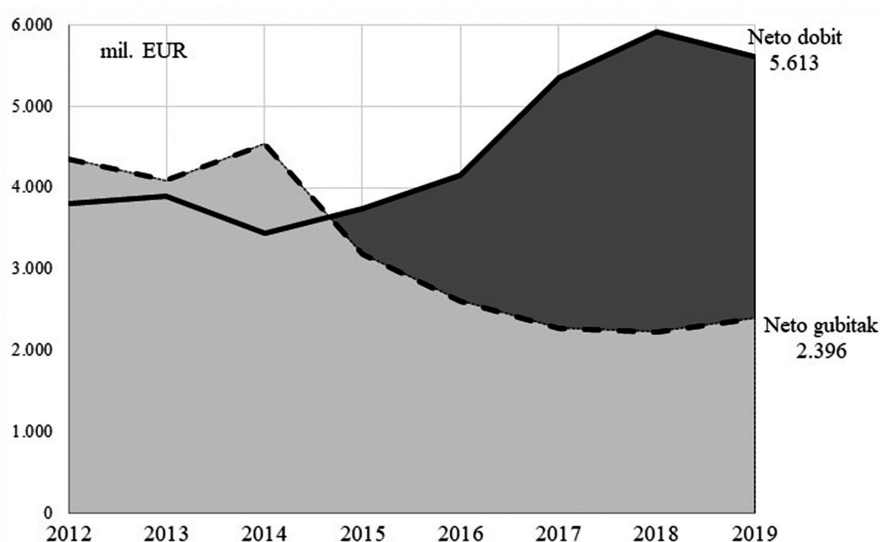
Pozitivne performanse poslovanja privrede, u periodu 2015-2019, najvećim delom su rezultat efikasnijeg poslovanja preduzeća u osnovnoj delatnosti, ali i, jednim delom, eksternih efekata (konjunktura na globalnim tržištima, pad kamatnih stopa, politika deviznog kursa i aprecijacija dinara). Ključne performanse poslovanja privrede su pozitivne: rast bruto dodate vrednosti (BDV), zaposlenosti, neto dobit, 2,4 puta veća od neto gubitka, realni pad kumuliranog gubitka. Neto dobit je ostvarilo 60% preduzeća, u kojima je zaposleno 84% (980.000) radnika u privredi, neto gubitak je iskazan kod 25% preduzeća, sa 190.000 zaposlenih, dok je 15% preduzeća, sa 2.500 zaposlenih, prikazalo nulti finansijski rezultat. Performanse poslovanja velikih preduzeća pokazuju rast broja, zaposlenosti i ukupnog prihoda i smanjenje kumuliranog gubitka. Sektor mikro, malih i srednjih preduzeća (MMSP) povećao je svoju otpornost, posebno srednja preduzeća u svim segmentima: rast u broju, zaposlenosti, pozitivnom finansijskom rezultatu, rastu BDV-a i kapitala i smanjenju ukupnih obaveza.

## Privreda neto dobitaš

Privreda je u čitavom tranzicionom periodu, do 2015, poslovala sa neto dobitkom samo u tri navrata, u 2006, 2007 i 2011. Za dve decenije tranzicije, privreda je, po prvi put, četiri godine uzastopce (2015-2019) neto dobitaš, što je rezultat kontinuiranog privrednog rasta i poboljšanja makro i mikro performansi poslovanja (Slika 1). Neto finansijski rezultat je porastao za 6 puta (u evrima), odnosno, realno za 5,4 puta.

Pored toga, ekonomsko-finansijska analiza poslovanja privrede naglašava sledeće trendove:

- Realan rast neto dobiti privrede, u periodu 2015-2019, iznosio je 38% (prosečno godišnje 8,4%), dok su neto gubici privrede realno smanjeni za 30,9% (prosečno su se smanjivali 8,8%);
- Ukupnu pozitivnu sliku poslovanja privrede narušava trend postepenog pada pozitivnog neto finansijskog rezultata u 2018 i 2019. Realni lančani indeksi pokazuju trend pada neto dobiti, uz trend rasta neto gubitka, što rezultira manjim pozitivnim finansijskim rezultatom privrede;



Slika 1 Pozitivan neto rezultat privrede 2015-2019.

- Privreda RS je, u periodu 2015-2019, proizvela 85,8 milijardi evra nove vrednosti, odnosno, BDV privrede je realno porasla za 35,3%, sa prosečnom godišnjom stopom od 7,8%.

## Kvalitativne strukturne performanse privrede

Kvalitativne ekonomsko-finansijske performanse poslovanja privrede pokazuju pozitivan trend u periodu privrednog oporavka 2015-2019 (Tabela 6). Poboľjšani su produktivnost (14,4%), ekonomičnost i solventnost, znatno je povećana rentabilnost (5 puta), neznatno je poboljšana likvidnost, stopa neto dobiti je povećana 4,5 puta (stopa poslovne dobiti neznatno), a stopa neto gubitka je skoro prepolovljena. Stopa prinosa na poslovnu imovinu (*Return on Assets* - ROA) povećana je dvostruko, a stopa prinosa na sopstveni kapital (*Return on Equity* - ROE) čak 4,2 puta.

Tabela 6 Kvalitativne performanse privrede

	2015	2016	2017	2018	2019
Produktivnost (u hilj. din.)	1.662	1.827	1.888	1.977	2.067
Ekonomičnost	1,01	1,03	1,05	1,05	1,04
Rentabilnost	1,11	2,84	5,46	6,13	5,22
Solventnost	1,54	1,57	1,59	1,63	1,63
Opšti racio likvidnosti	0,87	0,91	0,93	0,95	0,97
Reducirani racio likvidnosti	0,60	0,63	0,63	0,64	0,64
Stopa neto dobiti	0,79	2,07	3,83	4,29	3,47
Stopa poslovne dobiti	4,73	5,59	5,31	5,37	5,06
Stopa neto gubitka	4,21	3,26	2,60	2,40	2,41
ROA (stopa prinosa na poslovnu imovinu)	1,56	2,17	3,43	3,64	3,12
ROE (stopa prinosa na sopstveni kapital)	1,65	3,96	7,36	8,06	6,91

Metodološka napomena: Za period 2015-2018, korišćeni su konačni finansijski izveštaji APR, a za 2019, finansijski izveštaji za statističke potrebe, zbog uporedivosti pokazatelja profitabilnosti. Po pravilu, dobit je uvek veća u statističkim izveštajima nego u konačnim.

Izvor: Autor, na osnovu podataka APR

## Strukturne performanse privrede, u zavisnosti od veličine preduzeća

Konjunktura nije značajno poboljšala kvalitativne performanse preduzetničkog sektora (MMSP). Strukturna analiza je pokazala da su osnovne kvalitativne performanse velikih preduzeća na višem nivou od istih u sektoru MMSP:

- Rasponi u produktivnosti, između sektora MMSP i sektora velikih preduzeća, nisu se tokom čitavog perioda promenili - produktivnost velikih preduzeća kontinuirano je veća za 1/3 od produktivnosti sektora MMSP;
- Ekonomičnost mikro preduzeća je konstantno ispod proseka privrede, dok je ekonomičnost velikih preduzeća bila viša od ekonomičnosti sektora MMSP;
- Sektor MMSP je, osim u 2016, konstantno ispod prosečne rentabilnosti, pre svega, zbog nerentabilnosti mikro preduzeća;
- Velika preduzeća su najsolventnija, dok je sektor MMSP konstantno ispodprosečno solventan, isključivo zbog niske solventnosti mikro preduzeća;
- Mikro preduzeća imaju hroničan problem likvidnosti, srednja preduzeća su najlikvidniji deo privrede, dok velika imaju izražen problem likvidnosti;
- Mikro preduzeća su konstantno poslovala neprofitabilno, u zoni dubokog negativnog finansijskog *leverage*-a. Mala preduzeća su poslovala najprofitabilnije, i to u zoni pozitivnog finansijskog *leverage*-a (stopa prinosa na sopstveni kapital je konstantno dvostruko viša od stope prinosa na poslovnu imovinu). Srednja preduzeća su poslovala profitabilno, sa pozitivnim finansijskim *leverage*-om, ali sa nepromenjenim ROA i ROE 2016-2019. Velika preduzeća su poslovala prosečno profitabilno, sa oštrim padom u 2019 (Tabela 7).

## Sektorske promene

Strukturna analiza pokazala je da je u strukturi BDV-a privrede, pored nastavka trenda jačanja uslužnog sektora, što je ključna determinanta "paradigme strukturnih promena" (Islam & Iversen, 2018, 4), zapažen rast sektora Građevinarstva, dok je u strukturi zaposlenih primetan rast zaposlenih u Prerađivačkoj industriji i u nekim uslužnim delatnostima (Turizam, Stručne, naučne i inovacione usluge i Administrativne usluge). Evidentan je strukturni pad sektora Saobraćaja, Poljoprivrede, Rudarstva i Snabdevanja električnom energijom.

Sektorska analiza likvidnosti (Tabela 8), pokazuje da su sledeći sektori najlikvidniji: Rudarstvo (opšti ratio likvidnosti je 1,46 i reducirani ratio je 0,75), Prerađivačka industrija (1,04 i 0,63) i Trgovina (1,11 i 0,68), dok su najnelikvidniji sektori privrede Saobraćaj (0,75 i 0,66), Električna energija (0,82 i 0,62) i Građevinarstvo (0,94 i 0,60).

Sektorska analiza profitabilnosti signalizira: da je Trgovina konstantno imala visoku poslovnu profitabilnost, Prerađivačka industrija je, u periodu 2016-2019, ostvarila visoke stope prinosa na sopstveni kapital, odnosno, poslovnu profitabilnost, Građevinarstvo iz godine u godinu poboljšava

**Tabela 7** Profitabilnost privrede po veličini preduzeća

	2015					2016					2017					2018					2019				
	P	Mk	M	S	V	P	Mk	M	S	V	P	Mk	M	S	V	P	Mk	M	S	V	P	Mk	M	S	V
Stopa neto dobiti	0,8	-3,0	3,1	-1,5	2,7	2,1	-3,6	3,0	4,0	2,8	3,8	-1,6	4,1	4,3	5,6	4,3	0,1	3,6	4,4	6,2	3,5	0,0	5,1	4,4	3,3
Stopa poslovne dobiti	4,7	2,7	5,1	4,5	5,5	5,6	3,2	5,7	5,6	6,6	5,3	3,3	5,3	5,2	6,2	5,4	3,7	5,2	5,4	6,1	5,1	4,4	5,8	5,8	4,4

Legenda: P - privreda; Mk - mikro preduzeća; M - mala preduzeća; S - srednja preduzeća; V - velika preduzeća.

Izvor: Autor, na osnovu podataka APR

**Tabela 8** Sektorske promene likvidnosti 2015-2019.

	Opšti ratio likvidnosti						Reducirani ratio likvidnosti					
	2015	2016	2017	2018	2019	2015 2019	2015	2016	2017	2018	2019	2015 2019
Privreda	0,87	0,91	0,93	0,95	0,97	0,06	0,60	0,63	0,63	0,64	0,64	0,04
Poljoprivreda	0,90	0,95	0,97	1,00	1,05	0,15	0,53	0,57	0,56	0,58	0,61	0,08
Rudarstvo	0,70	0,95	0,97	1,26	1,46	0,76	0,53	0,72	0,69	0,74	0,75	0,22
Prerađivačka ind.	0,79	0,87	0,93	0,98	1,04	0,25	0,49	0,56	0,57	0,59	0,63	0,14
Električna energija	0,73	0,68	0,62	0,60	0,82	0,09	0,57	0,57	0,51	0,48	0,62	0,05
Snabdevanje vodom	0,78	0,73	0,72	0,70	1,06	0,28	0,61	0,57	0,56	0,54	0,53	-0,08
Građevinarstvo	0,74	0,77	0,80	0,84	0,94	0,20	0,45	0,48	0,45	0,52	0,60	0,15
Trgovina	1,01	1,02	1,05	1,08	1,11	0,10	0,63	0,62	0,63	0,66	0,68	0,05
Saobraćaj i skladištenje	0,89	0,84	0,78	0,96	0,75	-0,14	0,78	0,74	0,69	0,82	0,66	-0,12

Izvor: Autor, na osnovu podataka APR

performanse i ukupne i poslovne profitabilnosti, ali još je ispod proseka privrede. Sektori Električne energije, Poljoprivrede i Snabdevanja vodom su poslovali u zoni niske profitabilnosti i negativnog finansijskog *leverage*-a. Sektor Saobraćaja pokazuje volatilitnost (Tabela 9).

## Strukturne promene u Prerađivačkoj industriji

Ključna poluga, u novom modelu privrednog rasta, bazira se na poboljšanju performansi i strukturnim promenama Prerađivačke industrije. U periodu

oporavka privrede, broj preduzeća u Prerađivačkoj industriji je povećan za 5,1%, broj zaposlenih 27,2%, prihod 17,9%, neto rezultat 35,4%, BDV 16,8%, kapital 32,7%, dok je kumuliran gubitak smanjen, -18,6%, kao i ukupne obaveze, -1,7% (Tabela 10).

Prerađivačka industrija je, iz pozicije neto gubitnika 2015, u periodu 2016-2019, ušla u pozitivnu zonu neto dobitaša, čiji neto rezultat je 2019, iznosio 940 miliona evra, odnosno, 28% neto rezultata privrede. Oblasti: Metalni proizvodi, Nemetali, Farmacija, Piće, Duvanska industrija, Papir i proizvodi od papira, Mašine i oprema i Drvna industrija, konstantno su neto dobitaši, bez većih oscilacija; oblast Gume i

**Tabela 9** Sektorske promene profitabilnosti 2015-2019.

	ROA					ROE				
	(stopa prinosa na ukupnu imovinu)					(stopa prinosa na sopstveni kapital)				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Privreda	1,56	2,17	3,43	3,64	3,12	1,65	3,96	7,36	8,06	6,91
Poljoprivreda	59,92	1,95	1,42	0,25	1,06	119,08	2,39	1,58	-0,37	1,28
Rudarstvo	2,54	3,56	3,75	20,47	3,67	3,61	7,18	5,53	40,96	5,53
Prerađivačka ind.	0,40	3,60	5,67	3,78	3,82	-4,25	11,23	17,72	9,85	9,69
Električna energija	2,08	1,69	2,31	0,82	0,85	2,37	1,95	3,37	0,72	0,62
Snabdevanje vodom	89,88	1,61	1,74	1,12	2,15	137,64	1,87	2,32	1,38	3,25
Građevinarstvo	-0,13	0,00	1,05	2,10	2,49	-2,78	-2,30	0,83	4,50	6,37
Trgovina	2,98	2,31	3,80	3,12	3,55	8,49	7,20	12,93	9,88	11,18
Saobraćaj i skladištenje	3,30	2,74	2,82	7,34	2,84	5,25	3,80	4,10	12,96	5,34

Izvor: Autor, na osnovu podataka APR.

**Tabela 10** Performanse Prerađivačke industrije

	Broj preduzeća	Broj zaposlenih	Ukupan prihod	Neto dobit	Neto gubitak	Neto rezultat	BDV	Kumulirani gubitak	Obaveze
2019 (mil. evra)									
Privreda	104.487	1.171.890	102.931	5.805	2.478	3.327	20.602	29.697	82.073
Prerađivačka	17.548	381.012	27.476	1.674	734	940	5.681	8.375	18.889
2019/2015 (stope u %)									
Privreda	10,4	18,3	20,9	38,0	-30,9	435,0	35,3	-8,6	6,9
Prerađivačka	5,1	24,7	17,9	27,6	-52,2	35,4	16,8	-18,6	-8,8

Izvor: Autor, na osnovu podataka APR

plastika zabeležila je rekordno visok neto rezultat u 2019, 282 miliona evra, što je 30% Prerađivačke industrije, a konstantni neto gubitnici su oblasti Koks i derivati nafte i Industrija metala. U većini oblasti Prerađivačke industrije, poslovna dobit je veća od neto dobiti, što je, uglavnom, posledica negativnog finansijskog rezultata. Najveći dispariteti neto rezultata i poslovne dobiti su registrovani kod Prehrambene industrije. Značajni dispariteti dobiti iz osnovne delatnosti (*core business-a*) i ukupnog poslovanja u korist dobiti iz osnovne delatnosti registrovani su u oblastima: Piće, Odevni predmeti, Hemijska industrija, Papir i proizvodi od papira, Nemetali, Metalni proizvodi, Električna oprema, Mašine i oprema. Prerađivačka industrija Srbije je, u periodu 2015-2019, proizvela 24,8 milijardi evra nove vrednosti, odnosno, BDV Prerađivačke industrije je realno porasla za 16,8%, sa prosečnom godišnjom stopom od 4% (Tabela 11).

Kvalitativne ekonomsko-finansijske performanse poslovanja Prerađivačke industrije pokazuju pozitivan trend u periodu 2016-2019, uz dosta oscilacija. Poboľjšani su solventnost i rentabilnost, stope neto i poslovne dobiti, dok stope prinosa na poslovnu imovinu (ROA) i stopa prinosa na kapital (ROE) pokazuju oscilacije. Ono što je najpozitivnije jeste pad zaduženosti, posebno odnos ukupnih obaveza i kapitala. Najlikvidnije oblasti Prerađivačke industrije su: Farmacija, Guma i plastika, Industrija papira, Duvan, Koža, Odeća, Prehrambena industrija i Računari i električna oprema. Najveće probleme sa likvidnošću imaju Industrija motornih vozila, Saobraćajna sredstva, Mašine i oprema, Koks i nafta i Industrija metala. Najprofitabilnije oblasti Prerađivačke industrije su: Farmacija, Guma i plastika, Mašine i oprema, Industrija papira i Duvanska industrija. Najveće stope ROA imaju Farmacija, Guma i plastika, Industrija papira i Duvanska industrija, dok najveće stope prinosa na kapital imaju, pored pomenutih oblasti, Mašine i oprema i Industrija nemetala.

Generalno, strukturne promene u privredi nisu bile efikasne, jer nisu bile vođene faktorima-pokretačima, u prvom redu istraživanjem i razvojem (I&R) i inovacijama (Micic, 2017, 44). Tehnološka struktura

**Tabela 11** BDV Prerađivačke industrije po oblastima

	Kumulativan rast		Kumulativan rast
Prehrambena	11,2	Guma i plastika	38,4
Piće	11,9	Nemetali	46,2
Duvan	111,6	Metali	-78,5
Tekstil	27,3	Metalni pr.	36,4
Odeća	26,8	Računari, el. proizvodi	56,4
Koža	52,1	El. oprema	43,5
Drvo	33,9	Mašine i oprema	45,4
Papir	21,7	Motorna vozila	39,2
Štampa	15,5	Saobraćajna sredstva	32,9
Koks i nafta	-98,4	Nameštaj	93,1
Hemija	10,8	Ostalo	83,9
Farmacija	4,8	Montaža mašina	150,4

Izvor: Autor, na osnovu podataka APR

prerađivačke industrije je konstantno nepovoljna i dominantno je učešće grana niske tehnološke složenosti (Tabela 12). Mada je primetno poboljšanje tehnološke strukture u *High-tech* granama, u periodu 2017-2019, rast učešća u strukturi BDV sa 4,7% na 5,5% - u 2019, u više od 80% preduzeća radi 73,4% radnika u oblastima niske i srednje niske tehnološke intenzivnosti i stvara 73% BDV prerađivačke industrije.

### Promene u vlasničkoj strukturi privrede

Performanse svojske strukture privrede (Tabela 13), pokazuju trend jačanja uticaja kompanija sa većinskim stranim kapitalom na poslovanje privrede. Istraživanja pokazuju da strane akvizicije od multinacionalnih preduzeća imaju bolje poslovne performanse, ne samo od prosečne domaće firme u trenutku kupovine, već i poboljšavaju svoje performanse nakon kupovine

**Tabela 12** Performanse tehnološke strukture Prerađivačke industrije

	Preduzeća		Zaposleni		BDV		
	Broj	%	Broj	%	2017	2018	2019
Low-Tech	9.737	55,5	171.449	45,0	43,2	43,2	43,9
Medium Low Tech	4.497	25,6	108.065	28,4	29,8	29,2	28,0
Medium High Tech	2.404	13,7	89.372	23,5	22,3	22,5	22,6
High Tech	910	5,2	12.126	3,2	4,7	5,1	5,5
Ukupno	17.548	100,0	381.012	100,0	100	100	100,0

Izvor: Autor, na osnovu podataka APR

**Tabela 13** Performanse vlasničke strukture privrede 2015-2019.

	Broj preduzeća	Broj zaposlenih	Prihod	Neto dobit	Neto gubitak	Neto rezultat	BDV	Kapital	Kumulirani gubitak	Obaveze
Privreda	10,4	18,3	20,9	38,0	-30,9	187,01	35,3	13,6	-8,6	6,9
Privatna	10,4	29,9	28,0	51,6	-32,9	135,71	44,8	27,8	2,8	17,0
Privatna strana	8,1	53,1	36,4	67,5	18,8	95,2	50,0	55,0	25,6	31,5
Privatna domaća	10,5	21,9	23,1	42,1	-45,0	183,01	41,1	15,4	-6,6	10,9
Državna	7,6	-20,3	-17,3	-39,4	-26,8	-	1,5	-6,1	-21,9	-16,1

Izvor: Autor, na osnovu podataka APR

brže od domaćih firmi (Ragoussis, 2020, 77). Strane privatne kompanije, koje konstantno povećavaju doprinos privrednom rastu, povećale su zaposlenost za više od 50%, a natprosečno su im rasli prihod, BDV i kapital, ali, istovremeno, i kumulirani gubitak i obaveze. Domaći privatni sektor je poboljšao svoje performanse, ostvario je značajan neto rezultat i smanjio gubitke. Državni sektor je smanjio broj zaposlenih za 1/5, kao i gubitke i obaveze, ali je i poslovao sa gubitkom. Učešće kompanija, koje su u većinskom stranom vlasništvu, u BDP se konstantno povećava, sa 12,3% u 2015., na 15,9% u 2019. Učešće domaćih privatnih preduzeća u BDP se povećalo sa 17,5% na 21,4%, dok je, istovremeno, učešće državnih preduzeća opalo sa 8,3% na 7,3%. Rast broja stranih privatnih kompanija, u periodu 2015-2019, iznosio je 8,1%; rast broja zaposlenih u privredi od 18,3% najviše

je lociran u stranim kompanijama (rast od 53,1%), u kojima radi oko 300.000 radnika.

Strane privatne kompanije povećale su novostvorenu vrednost za 50%, što je značajno više od domaćeg privatnog sektora (41,1%); povećale su kapital dvostruko više od rasta kapitala u domaćem privatnom sektoru, 55% nasuprot 27,8%.

Kvalitativne performanse poslovanja svojinske strukture privrede, pokazuju da su performanse poslovanja stranih privatnih kompanija na višem nivou od performansi poslovanja domaćeg privatnog sektora (Tabela 14). Produktivnost stranih privatnih kompanija je konstantno viša od domaćih, ekonomičnost je neznatno viša kod stranih preduzeća, rentabilnost stranih kompanija je 2015. bila 8 puta viša, da bi se dispariteti 2019. smanjili na 30%. Solventnost privatnog stranog sektora je konstantno viša od

**Tabela 14** Kvalitativni pokazatelji svojinske strukture privrede

	2018			2019		
	PS	PD	DP	PS	PD	DP
Ekonomičnost	1,05	1,05	1,04	1,06	1,05	0,97
Rentabilnost	9,6	9,1	1,0	10,4	8,0	-1,7
Solventnost	1,6	1,5	1,9	1,7	1,5	1,9
ORL	1,13	1,06	0,53	1,18	1,07	0,51
RRL	0,77	0,69	0,41	0,81	0,69	0,38
Stopa neto dobiti	4,1	4,7	2,8	4,9	3,9	-4,8
Stopa poslovne dobiti	5,8	4,6	8,7	5,7	5,4	0,2
ROA	4,8	4,8	1,1	5,4	4,2	-0,7
ROE	11,3	13,1	1,3	12,1	11,2	-2,4
Zaduženost 1	58,7	60,8	46,1	56,6	61,7	47,3
Zaduženost 2	141,9	154,9	85,4	130,3	160,8	89,6

Legenda: PS-privatna strana preduzeća; PD-privatna domaća preduzeća; DP-državna preduzeća; ROA - stopa prinosa na poslovnu imovinu; ROE - stopa prinosa na kapital; Zaduzenost 1 - odnos ukupnih obaveza i ukupnih izvora finansiranja; Zaduzenost 2 - odnos ukupnih obaveza i kapitala.

Izvor: Autor, na osnovu podataka APR

domaćeg privatnog sektora. Takođe, likvidnost stranih kompanija je konstantno na višem nivou, posebno ako analiziramo oštriju likvidnost preko reduciranog raciona likvidnosti. Profitabilnost poslovanja stranih kompanija je veća, i to posebno ukupna profitabilnost. Dispariteti u prinosu na poslovnu imovinu (ROA) stranih kompanija u odnosu na domaća preduzeća su se postepeno, iz godine u godinu, smanjivali ali su i dalje značajni - 5,4% naspram 4,2%. Niži su dispariteti u prinosu na kapital (ROE). Zaduzenost stranih kompanija je, uz neznatne oscilacije, na nižem nivou od zaduzenosti domaćeg privatnog sektora. Državni sektor posluje nerentabilno, nelikvidno i neprofitabilno.

## STRUKTURNI PROBLEMI U POSLOVANJU PRIVREDE

Strukturna analiza performansi privrede istakla je probleme koji u kontinuitetu opterećuju poslovanje privrede, a koji se odnose se probleme nelikvidnosti

i zaduzenosti, odnosno, visinu gubitaka i obaveza. Koncentracija problema je u grupacijama preduzeća bez zaposlenih i u mikro preduzećima. Značajna grupacija preduzeća bez zaposlenih, ili sa jednim zaposlenim, sve više opterećuju poslovanje privrede. Naime, više od 50% preduzeća u privredi bez zaposlenih, ili sa jednim zaposlenim, konstantno stvaraju 1/3 tekućih i više od 40% kumuliranih gubitaka. Sve kvalitativne performanse poslovanja, skoro 90.000 mikro preduzeća (preduzeća do 9 zaposlenih), ispod su proseka privrede i njihovo poslovanje je nesolventno, nerentabilno, nelikvidno, nisko profitabilno i opterećeno gubicima i zaduzenošću.

Ključni višedecenijski problemi u poslovanju privrede jesu trend rasta ukupnih obaveza i visina zaduzenosti. Ukupne obaveze privrede su, u proteklih pet godina, realno povećane za 7%, zaduzenost privrede je i dalje visoka, i pored relativnog smanjenja zbog povoljnih izvora finansiranja. Kumulirani gubici privrede su visoki - u 2019. iznosili su skoro 30 milijardi eura. U strukturi kumuliranih gubitaka, 48,6% je locirano u

mikropreduzećima, 10% u malim, 11,9% u srednjim i 29,4% u velikim preduzećima. Treba napomenuti, da je konstantno visoka stopa izgubljenog kapitala u privredi (36,6%).

Visina spoljnog duga sužava manevarski prostor za poboljšanje performansi privrede, rast investicija i povećanje životnog standarda. Spoljni dug RS, u periodu 2015-2019, povećan je za 2,18 milijardi eura, dug privrede za 2,44 milijarde eura, javni sektor je smanjio dug za 1,43 milijarde eura, dok je dug banaka porastao za 1,17 milijardi eura.

## ZAKLJUČAK

Globalna konjunktura, u periodu 2015-2019, doprinela je ubrzanju rasta u Republici Srbiji, prosečni rast BDP od 3,5% bio je viši od prosečnog rasta u državama regiona, s tim što su se i pre početka globalne recesije, pojavili signali usporavanja rasta. Najveći doprinos rastu dali su makroekonomski agregati investicije i lična potrošnja. Sprovedena fiskalna konsolidacija doprinela je smanjenju unutrašnjih i spoljnih makroekonomskih neravnoteža. Budžet je, od 2017, uravnotežen, ali je i dalje prisutan hroničan problem spoljnotrgovinskog deficita. SDI, posebno njihov strukturni aspekt, dale su doprinos makroekonomskoj stabilnosti i time amortizovale problem pokrivenosti deficita tekućeg računa platnog bilansa. Izuzetno je bitno da su porast fiskalne discipline i izbalansirane javne finansije doprinele smanjenju javnog i spoljnog duga. Iz socijalnog ugla je najvažnije da su se pozitivni makroekonomski rezultati najviše odrazili na tržište rada.

Istraživanje je pokazalo da, imajući u vidu ogroman tranzicioni zaostatak, kao i periferan status kompletnog područja JIE, brzina, posvećenost i kapacitet države u sprovođenju strukturnih reformi u proteklom periodu konjunktura nisu bili u funkciji ekonomskog sustizanja i jačanja privredne konkurentnosti.

Osnovni doprinos istraživanja efekata strukturnih promena u privredi je potvrda hipoteze da

su sprovedene strukturne reforme u periodu konjunktura bile nedovoljne, odnosno, da privredna konjunktura nije doprinela očekivanim strukturnim promenama (hipoteza H1). Preduzetnički sektor je blago poboljšao svoje performanse, otpornost je najviše poboljšao segment srednjih preduzeća. Konjunktura se pozitivno odrazila na poslovanje velikih preduzeća.

Privreda RS je po prvi put, za dve decenije tranzicije, četiri godine uzastopce neto dobitaš, što je rezultat kontinuiranog privrednog rasta i poboljšanja makro i mikro performansi poslovanja. Dodatni istraživački doprinos predstavljaju nalazi kvalitativnih performansi privrede, koji pokazuju da su poboljšane ključne kvalitativne ekonomsko-finansijske performanse poslovanja privrede: produktivnost, ekonomičnost, solventnost i rentabilnost, dok je profitabilnost zabeležila visok rast (H21).

Strukturna analiza privrede je pokazala, s jedne strane, nastavak trenda jačanja BDV uslužnog sektora i sektora Građevinarstva i u strukturi zaposlenih rast u Prerađivačkoj industriji (hipoteza H1), dok je, s druge strane, registrovan strukturni pad sektora Saobraćaja, Poljoprivrede, šumarstva i vodoprivrede, Rudarstva i Snabdevanja električnom energijom. Konjunktura se pozitivno odrazila na rast profitabilnosti sektora Trgovine, Prerađivačke industrije i Građevinarstva (H1). Pošto je ključna poluga u novom modelu privrednog rasta bazirana na poboljšanju performansi i strukturnim promenama Prerađivačke industrije, istraživanje je pokazalo da su u periodu konjunktura:

- najlikvidnije oblasti: Farmacija, Guma i plastika, Industrija papira, Duvan, Koža, Odeća, Prehrambena industrija i Računari i električna oprema; i
- najprofitabilnije: Farmacija, Guma i plastika, Mašine i oprema, Industrija papira i Duvanska industrija.

Da strukturne promene u privredi nisu bile vođene faktorima-pokretačima privrednog rasta (I&R i inovacije), pokazuju nalazi istraživanja tehnološke strukture Prerađivačke industrije, koja je konstantno nepovoljna i u kojoj je dominantno učešće grana niske

tehnološke složenosti, mada je registrovan blagi trend pozitivnih poboljšanja (H21).

Istraživanje strukturnih performansi svojinske strukture pokazuje trend jačanja uticaja kompanija sa većinskim stranim kapitalom na poslovanje privrede, kao i da multinacionalna preduzeća imaju bolje poslovne performanse, ne samo od prosečne domaće firme u trenutku kupovine, već i da poboljšavaju svoje performanse nakon kupovine brže od domaćih firmi. Učešće kompanija u većinskom stranom vlasništvu u BDP se konstantno povećava, strane privatne kompanije povećale su novostvorenu vrednost za 50%, što je značajno više od domaćeg privatnog sektora (41,1%). Ključne kvalitativne performanse poslovanja stranih privatnih kompanija su na višem nivou od performansi poslovanja domaćeg privatnog sektora (H2). Državni sektor posluje nerentabilno, nelikvidno i neprofitabilno.

Stari strukturni problem, koji opterećuju poslovanje privrede, odnose se hroničan problem nelikvidnosti i zaduženosti, odnosno, visinu gubitaka i obaveza. Preduzeća bez zaposlenih, ili sa jednim zaposlenim, konstantno predstavljaju tranzicioni teret (stvaraju više od 40% kumuliranih gubitaka). Kvalitativne performanse poslovanja skoro 90.000 mikro preduzeća ispod su proseka privrede. Ona kontinuirano posluju nesolventno, nerentabilno, nelikvidno, nisko profitabilno i opterećena su gubicima i zaduženošću. Stopa izgubljenog kapitala u privredi je i dalje izuzetno visoka. Jedan od najvećih izazova, koji sužava manevarski prostor za poboljšanje performansi privrede, rast investicija i povećanje životnog standarda, je visina spoljnog duga.

Empirijsko istraživanje zahtevalo je ukrštanje kompleksnih baza podataka i razvrstavanje privrednih subjekata po različitim metodologijama. Osnovno ograničenje odnosilo se metodologiju razvrstavanja privrednih subjekata prema vlasničkoj strukturi. S obzirom da je obuhvat državnih preduzeća dosta diversifikovana kategorija, u istraživanju je primenjena sektorska klasifikacija institucionalnih jedinica, koja je pod kategorijom

državnih preduzeća obuhvatila javna, državna neprivatizovana i preduzeća u stečaju ili likvidaciji.

Imajući u vidu nepredvidivost globalne recesije, uzrokovane posledicama COVID-19 (Guerrieri, Lorenzoni, Straub & Werning, 2020, 34), fokus ekonomske politike u narednom periodu treba da bude usmeren ka ciljanom paketu pomoći privredi i zdravlju. Strukturna analiza performansi privrede detektovala je ključne (stare) probleme i uzroke niske konkurentnosti. Prioritetne reformske aktivnosti treba da obezbede ambijent koji je povoljan za razvoj domaćeg preduzetništva i rast privatnih investicija, kako bi se povećalo poverenje na relaciji preduzetništvo-institucije. U tom kontekstu, neophodno je institucionalno objedinjavanje ključnih strukturnih reformi, koje doprinose privrednom rastu, što uključuje transformisanje javnih preduzeća i podsticanje bržeg razvoja domaćeg preduzetništva (Jakopin & Čokorilo, 2019, 66-67).

Naredna istraživanja, potrebno je da budu usmerena ka sistemskim reformama u sledećim oblastima: poboljšanje efikasnosti upravljanja državnom imovinom; povećanje efikasnosti javnog upravljanja kroz uvođenje integrisanog sistema strateškog planiranja i upravljanja privrednim, regionalnim i sektorskim razvojem (Ristic, Boskovic & Despotovic, 2019, 70); formiranje finansijskih razvojnih institucija (Razvojne banke Srbije, Garantnog fonda); podsticanje rasta onih oblasti Prerađivačke industrije i konkretnih domaćih preduzeća koji imaju potencijal za rast poslovnog prihoda (*core business*); formiranje sektorskih industrijskih zona; unapređenje poslovnog ambijenta u cilju rasterećenja preduzetnika od administrativnog i finansijskog opterećenja; reforma obrazovanja u skladu sa potrebama privrede; kreiranje podsticajnih paketa privrednim subjektima i sektorima u cilju poboljšanja efikasnosti resursa kroz korišćenje čistih tehnologija i zaštitu životne sredine. Napredak u svim relevantnim reformskim oblastima primarno će zavistiti od institucionalnih reformi, a najveći izazovi su u dve reformske oblasti: vladavina prava i kontrola korupcije.

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## EFFECTS OF STRUCTURAL CHANGES IN THE ECONOMY OF THE REPUBLIC OF SERBIA: OLD PROBLEMS, NEW REFORM CHALLENGES

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Structural changes in the economy directly affect macroeconomic and financial stability, income growth, productivity and economic efficiency, social inclusion, and the improved quality of life. The global contraction in 2020, caused by COVID-19, the deepest since the Second World War, will cause a great global economic reset, extreme poverty will increase, and the biggest permanent loss will be in human capital. The biggest consequences for the Serbian economy will be a slowdown in structural reforms. The key performance of the economy in the conjunctural period was positive and affected the growth of the resilience of the economic system, but the research showed that the implemented structural reforms were insufficient and slow, that the old problems are still the causes of low competitiveness. In the context of new reform challenges, the focus of activities needs to be shifted towards creating a stimulating environment for the development of domestic entrepreneurship and the growth of private investment in order to increase trust in the entrepreneurship-institution relationship.

**Keywords:** the macroeconomic and reform balance of the economy, effects of the structural performance of the economy and the manufacturing industry, qualitative indicators, structural problems, reform challenges

JEL Classification: L32, M21, O11, P11

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## REVISITING THE FOREIGN DIRECT INVESTMENT-LED AND EXPORT-LED GROWTH HYPOTHESES IN ASEAN+3 COUNTRIES

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In this paper, the effects of Foreign Direct Investments (FDIs) and exports on economic growth in the Association of Southeast Asian Nations Plus Three countries are explored. The panel data of a total of 13 countries pertaining to the period from 2008 to 2018 were analyzed. Based on the result of the Lagrange Multiplier (LM) test, the data fit to the random effect model. In a similar fashion, the Wald test suggests that there is no endogeneity problem in the given model. Furthermore, the results of the Hausman and Chow test also indicate that the random effect model is the most effective model to describe the effects of FDIs and exports on economic growth. The results prove that FDIs positively impact economic growth. In addition, exports also have a positive and meaningful effect on economic growth. Overall, the paper empirically confirms FDI-led growth and export-led growth. To conclude, the findings indicate the fact that FDIs and exports are crucial for boosting the economic growth of the ASEAN+3 countries. The ASEAN+3 region remains quite an attractive destination for international companies around the world when FDIs and trade are concerned.

**Keywords:** ASEAN+3, foreign direct investments, export, growth, panel data

JEL Classification: F15, F20

### INTRODUCTION

Starting in July 1997, several East Asian and Southeast Asian countries began to suffer from

the East Asian financial crisis that raised concerns about possible global economic meltdowns due to financial contagion. As such, the East Asian financial crisis gained in significance among and became focused on by policymakers and scholars (Miankhel, Thangavelu & Kalirajan, 2009). At the ministerial and head-of-government levels, the governments of the 10 Southeast Asian and three East Asian countries

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regularly met to discuss strategies to prevent potential financial crises and promote regional cooperation. A Joint Statement on the Cooperation of East Asia, recognized as ASEAN Plus Three (ASEAN+3 or APT), was issued by the 13 heads of government in 1999. It emphasized their dedication to deepening global, financial, social and political dialogues in order to foster cooperation in the areas of a mutual interest and concern, including the energy, transportation, information and communication infrastructures.

In 2017, a strong global economic growth of 3.7% positively influenced trade and investment growth between the ASEAN+3 countries (ASEAN Secretariat, 2020). The total trade increased by 16.1% to USD 807.3 billion, accounting for 31.6% of the total merchandise trade in ASEAN. In addition, the ASEAN+3 Foreign Direct Investments (FDI) flows were estimated at USD 29.9 billion, thus constituting 21.8% of ASEAN's overall FDI inflows (ASEAN Secretariat, 2018).

Trade with China, Japan, and the Republic of Korea helped ASEAN to gain a significant momentum during the global economic uncertainties. In 2018, the trade of ASEAN Plus Three increased by 6.8% to USD 869.1 billion, or 31.0% of ASEAN's total trade. The FDI flows from the Plus-Three nations to ASEAN were measured at USD 37.9 billion. ASEAN accounted for 24.5% of the overall FDI inflows, which increased by 9.9% compared to the previous year (ASEAN Secretariat, 2020). In a similar fashion, T. Widodo (2009) noted that the trends of the comparative advantage of the ASEAN+3 countries had changed. Therefore, the relationship between the growth of the economy, FDIs and exports in the ASEAN+3 countries should be recognized. To understand how these variables work from the point of view of the policy would improve economic growth.

In developing and developed countries, the relationship between FDIs, exports and economic growth remains scholars' significant theoretical and empirical interest (Acaravci & Ozturk, 2012). Recently researchs, Md. R. Sultanuzzaman, H. Fan, M. Akash, B. Wang and U. S. Md. S. (2018) and A. Jamal and M. A. Bhat (2019), have demonstrated the roles of both exports and FDIs in economic growth. Several previous studies suggest that FDIs are the

key determinant of overall growth (see the review of the literature on FDI-led growth). However, the theory of export-led growth claims that exports are a significant predictor of overall growth (see the review of the literature on export-led growth). In a similar fashion, S. Sermcheep (2019) also empirically demonstrated ASEAN's export-led growth in services over the past decades. As such, this paper focuses on both the developing and the developed ASEAN and East Asian countries. Taking into consideration the fact that these countries are at various levels of development, the impact of exports and FDIs on growth in the different phases of growth are arguably established in this research study.

The issue is addressed in this paper in several sections. A literature review and the hypothesis development are established in the second section. In the third and fourth sections, the methodology is explained, the empirical results are presented, and a discussion is given. The last section of the paper addresses the drawbacks and ideas for future studies.

## LITERATURE REVIEW

### Foreign Direct Investments-led growth

The theoretical basis for the academic research in FDIs and growth originates from either neoclassical growth or endogenous growth model (Nair-Reichert & Weinhold, 2001). The neoclassical growth of the Solow growth model indicates the fact that FDIs increase capital stocks, as well as growth in the host economy, by financing capital formation (Brems, 1970). As countries shift towards a new steady state (domestic investment), FDIs only have a short-term impact on growth. However, the endogenous growth model explains that FDIs are widely acknowledged as more efficient than domestic investments, given the fact that they facilitate the inclusion of new technologies in the production function of the host economy (Borensztein, Gregorio, De & Lee, 1998).

The ultimate effect of FDIs on the production growth of the host economy depends on the extent of the

productivity spillovers of domestic companies (De Mello, 1997). It is possible due to the existence of a bidirectional statistical relationship between FDIs and production growth (Yalta, 2013). Based upon the FDI-led growth hypothesis, FDI inflows will stimulate development for host countries by raising capital stocks, establishing new employment opportunities and encouraging a technology transfer (Borensztein, Gregorio, De & Lee, 1998; De Mello, 1997). In other words, FDIs contribute to the enhancement of the returns of domestic outputs and the quality of the FDI-related value added of production. Additionally, current studies have shown the beneficial effects of FDIs on growth (Adams, 2009; Moudatsou & Kyrkilla, 2011; Acaravci & Ozturk, 2012; Mahmoodi & Mahmoodi, 2016; Hussain & Haque, 2016; Jamal & Bhat, 2019). However, by crowding out domestic investments, growing external vulnerability and creating dependence, it is also anticipated that FDIs will adversely affect growth (Aitken & Harrison, 1997). Furthermore, as the neutrality hypothesis suggests, there seems to be no significant correlation between FDIs and growth, either (Yalta, 2013). For these reasons, the first hypothesis that can be proposed is as follows:

H1: ASEAN+3 countries demonstrate FDI-led growth.

## Export-led growth

Early discussions on the export-led growth problem were only focused on the framework for correlation analysis and the simple regression model (Balassa, 1978; Heller & Porter, 1978). In stimulating economic development, an export-led growth strategy is a preferred policy prescription (Lim & Ho, 2013). The relationship between exports and economic growth is referred to as export-led growth, i.e. the situation that emerges from an increase in the export capacity of a nation. In the literature on international trade and development, studies with export-led growth hypotheses are hardly a new field of research (Tang, Lai & Ozturk, 2015). According to K. K. Gokmenoglu, Z. Sehnaz and N. Taspinar (2015), the theory of trade argues that exports support the domestic economy

across many channels. They are the only part of demand that can compensate for growth in terms of requirements for the growth of imports (capital goods) (McCombie & Thirlwall, 1994). This is an important explanation of the reason why, by pursuing an export-led growth strategy, exports matter and provide a justification for why countries benefit. Exports improve the economic growth through adding to gross production across the efficient utilization of resources and the creation of the resources based on foreign exchange. The reciprocal relationship between exports and growth is also connected with the export-led growth hypothesis (Petchko, 2018). Export-led growth theory assumes that international trade policies focus on exports driving economic growth (Richards, 2010; Yamada, 1998). Moreover, recent research studies have also shown that exports have a positive impact on growth (Acaravci & Ozturk, 2012; Mahmoodi & Mahmoodi, 2016; Hussain & Haque, 2016; Priyankara, 2018; Sermcheep, 2019; Jamal & Bhat, 2019). However, no causal relationship is likely to exist between exports and economic growth (Ramos, 2001; Hsiao & Hsiao, 2006; Shawa & Shen, 2013). Therefore, the second hypothesis that can be proposed is as follows:

H2: ASEAN+3 countries demonstrate export-led growth.

## METHODOLOGY

The three macroeconomic variables used in this study include economic growth, FDIs, and exports. Economic growth is the annual actual GDP growth rate, while FDIs are annual stock inflows. Lastly, exports apply to both the annual outflows of goods and the annual outflows of services. The data include the annual findings of the UNCTAD in 13 ASEAN+3 countries in the period from 2008 to 2018.

Moreover, R. C. Hill, H. E. Griffiths and G. C. Lim (2018) reveal that the stationarity test with one lagged difference eliminates the problem of autocorrelated residuals. The following equation 1 represents the stationarity test with a constant trend and no trend at all.

$$Y_{it} = \alpha_i + \gamma_i Y_{it-1} + \lambda_i + v_{it} \tag{1}$$

In addition, the models of the regression of the panel data are suggested in this paper. The following equations 2, 3, and 4 illustrate the three models (Hill, Griffiths & Lim, 2018), namely:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + e_{it} \tag{2}$$

$$Y_{it} = \beta_{0i} + \beta_1 X_{1it} + \beta_2 X_{2it} + e_{it} \tag{3}$$

$$Y_{it} = \bar{\beta}_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + v_{it} \tag{4}$$

where,

$Y_{it}$ : the economic growth of the  $i$  country in the  $t$  period

$x_{1it}$ : the FDIs of the  $i$  country in the period  $t$

$x_{2it}$ : the exports of the country  $i$  in the period  $t$

$\beta_0$ : the intercept parameter

$\beta_{0i}$ : the inividual intercept

$\bar{\beta}_0$ : the population average

$\beta_1, \beta_2$ : the regression coefficients

$e_{it}$ : the error term of the country  $i$  in the period  $t$

$v_{it}$ : the composite error term\*

Note: \*In order to accommodate such heterogeneity,  $e$  is decomposed into two independent components or the composite error term ( $v_{it} = \lambda_i + e_{it}$ ). It is assumed that  $e_{it}$  is i.i.d with the mean zero and variance (the remainder error term or the regular error term),  $\lambda_i$  refers to the individual-specific effect (unobserved heterogeneity) and is time invariant - it is constant across individuals (Law, 2018).

## RESULTS AND DISCUSSION

The outcomes of several studies are discussed in this section. The descriptive statistics of the variables are found in Table 1.

**Table 1** The summary of the descriptive statistics

Statistics	Y	$X_1$	$X_2$
Mean	3.522181	19169.04	45920.91
Median	3.801313	7600.000	20439.20
Maximum	9.844420	139043.5	266841.2
Minimum	-5.428591	-1758.334	5.766000
Std. Dev.	2.921867	34047.11	61878.69
Skewness	-0.705468	2.428814	1.450529
Kurtosis	3.727946	7.727336	4.191772
Jarque-Bera	15.01885	273.7512	58.60890
Probability	0.000548***	0.000000***	0.000000***
Sum	503.6719	2741173.	6566690.
Sum Sq. Dev.	1212.298	1.65E+11	5.44E+11
Observations	143	143	143

Note: \*\*\*  $p < 1\%$

Source: Authors

As is shown in Table 1, the mean values are positive for all the variables. Meanwhile, the exports ( $X_2$ ) and the FDIs ( $X_1$ ) have the highest standard deviation (61,878.69 and 34,047.11, respectively), which represents the volatility of the observation values. Furthermore, economic growth (Y) has the lowest standard deviation (2.921867). Jarque-Bera's indicate that the residual values of all the variables are usually distributed at 1%. Next, the correlation findings are summarized in Table 2.

Table 2 shows that the correlations between these three variables vary from -0.097417 to 0.481866. Interestingly, the FDIs ( $X_1$ ) and the exports ( $X_2$ ) demonstrate the strongest correlation, while economic growth (Y)

**Table 2** Correlation

Variable	Y	$X_1$	$X_2$
Y	1.000000		
$X_1$	0.309831	1.000000	
$X_2$	-0.097417	0.481866	1.000000

Source: Authors

and the exports ( $X_2$ ) have the weakest correlation. Thus, the FDIs and the trade flows in the ASEAN+3 countries were closely associated. The influence of FDIs on economic growth does not necessarily have to be the result of the statistically significant coefficient of the FDIs in the growth equation. The positive correlation could also be consistent with the causality from growth to FDIs, provided that rapid economic growth typically created higher demand and better profit opportunities for FDIs (Nair-Reichert & Weinhold, 2001). With the level  $I(0)$  and the first difference  $I(1)$ , the following Table 3 summarizes the results of the stationarity test.

Table 3 reveals the fact that the economic growth ( $Y$ ) is stationary at the level of  $I(0)$ , as can be seen from the statistics value of -18.5401 that is greater than the 99%

confidence level and the probability value of 0.0000 ( $p < 0.01$ ). In addition, the foreign direct investment ( $X_1$ ) variable has the statistics value of -7.67164 that is greater than the 99% confidence level and the probability value of 0.0000 ( $p < 0.01$ ). In a similar fashion, the export ( $X_2$ ) variable has the Augmented Dickey-Fuller value of -6.70535 that is greater than the 99% confidence level and the probability value of 0.0000 ( $p < 0.01$ ). According to N. R. Ericsson, J. S. Irons and K. W. Tryon (2001), the relationship between FDIs and growth was usually limited to the first differences  $I(1)$  by standard cross-country and panel studies on FDIs and growth. Based on the results, the panel stationarity test with the first difference also reveals that all the variables are stationary. The results of the Lagrange Multiplier and the Wald tests are shown in Table 4.

**Table 3** Stationarity

Variable	Statistics		Probability		Conclusion
	Level	First Difference			
$Y$	-18.5401	-19.0857	0.0000***	0.0000***	Stationary
$X_1$	-7.67164	-9.54222	0.0000***	0.0000***	Stationary
$X_2$	-6.70535	-4.27350	0.0000***	0.0000***	Stationary

Note: \*\*\*  $p < 1\%$

Source: Authors

**Table 4** The results of the Lagrange Multiplier and the Wald Tests

Test Statistics	Value	df	Probability
t-statistic	2.036377	127	0.0438
F-statistic	4.146829	(1, 127)	0.0438
Chi-square	4.146829	1	0.0417
$C(1)$	6.14E-05		2.89E-05
Breusch-Pagan LM	229.4771		0.0000***
Pesaran scaled LM	12.12787		0.0000***
Pesaran CD	3.546466		0.0004***

Note: \*\*\*  $p < 0.01$

Source: Authors

Table 4 shows that there is a random impact on the model, as suggested by the Breusch-Pagan value of 229.4771 (greater than the 99% confidence level) and the probability value of 0.0000 ( $p < 0.01$ ). In a similar fashion, the Wald test has a probability value above the conventional significance level ( $p > 0.01$ ). Wald tests suggest no endogeneity problem in the model. Table 5 displays the results of the pooled (OLS), fixed-effect and random-effect models.

Table 5 reveals that both the Hausman and the Chow tests suggest that the random effect model is best model. The table shows that the probability of the Hausman and the Chow tests is greater than 5%. The random-effect model shows that FDIs ( $DX_1$ ) significantly affect economic growth (thus supporting  $H_1$ ) with the probability value of 0.0438 ( $p < 0.05$ ). In a similar fashion, exports ( $DX_2$ ) significantly affect economic growth (thus supporting  $H_2$ ). However, the  $\bar{R}^2$  of the random-effect model is only 6.54%. It is worth noting that the  $\bar{R}^2$  value is generally lower in panel models (PeiZhi & Ramzan, 2020).

The findings show that, in the ASEAN+3 countries, the FDI-led growth hypothesis is approved. Commitments to reduce the costs of doing business would arguably stimulate FDIs. In this respect, the ASEAN+3 countries had been improving their Ease of Doing Business (EoDB). The region was incorporated into the increasing regional production networks in East Asia by the growth of FDIs in ASEAN (Chen &

Intal, 2017). According to A. Miankhel, S. Thangavelu and K. Kalirajan (2009), policymakers should remove the trade, fiscal, and financial barriers restricting exports and FDIs. Moreover, S. Adams (2009) revealed spikes in capital (FDIs) globalization in the last two decades. FDIs have been the most stable and the most important part of capital flows, indicating that they have been an effective alternative in the financial cycle in the developing countries. FDI inflows would enhance the growth of host countries by increasing their capital stocks, generating employment opportunities and allowing a transfer of technology (De Mello, 1997; Borensztein, De Gregorio & Lee, 1998). Several studies indicated that the effect of FDIs on economic growth depended on country-specific factors, such as the per capita income level of the host country, the human capital base, the degree of economic openness and the level of the development of the financial market (Blomstrom, Lipsey & Zejan, 1992; Balasubramanyam, Salisu & Sapsford, 1996; Borensztein, De Gregorio & Lee, 1998). In terms of the financial market, the ASEAN+3 Finance Ministers endorsed the creation of the ASEAN+3 Bond Market Forum at the 13<sup>th</sup> ASEAN+3 Finance Ministers' Meeting in Tashkent, Uzbekistan on May 2<sup>nd</sup>, 2010. It was a popular forum for promoting the standardization of business practices and the harmonization of cross-border bond transaction regulations in the country (Asian Development Bank, 2012). However, X. V. Vo (2009) stated that, due to inactive trading, many ASEAN+3 government bond

**Table 5** Summary of Models

Variable	OLS		FEM		REM	
	$\beta$	$p$	B	$p$	$\beta$	$p$
C	-0.020949	0.9158	-0.027416	0.8945	-0.020949	0.9192
$DX_1^*$	6.14E-05	0.0359	6.66E-05	0.0359**	6.14E-05	0.0438**
$DX_2^*$	1.00E-05	0.0155	1.08E-05	0.0138**	1.00E-05	0.0201**
$\bar{R}_2$	0.065403		-0.013970		0.065403	
Hausman-Test					4.678010	0.0964
Chow-Test			0.171548	0.9992		

Note: \* $DX_1$  and  $DX_2$  are the FDIs and the exports at the first difference degree of integration. \*\*  $p < 0.05$

markets were still in the early stages of development with low liquidity, whereas, on the other hand, Asia's solid fiscal balances had not led to the growth of government bond markets.

Moreover, the export-led theory of growth is also empirically accepted in this study. As these countries had achieved remarkable economic growth led by exports, the economies of the ASEAN+3 countries were becoming more and more interesting. It could be understood that the theory of international trade and development implies that exports are a significant source of economic growth. The expansion of exports would lead to a better allocation of resources, the creation of the economies of scale and output through technological growth, the formation of capital and the generation of jobs (Shirazi & Manap, 2005). The parts and components that were also exported to the rest of East Asia and the world as intermediate goods led to the expansion of intra-ASEAN trade (Chen & Intal, 2017). However, the traditional services dominated the export of the services of ASEAN countries. The exports of these services reached the two-thirds of the total service exports, whereas the proportion of the export of modern services was relatively small (Sermcheep, 2019). Furthermore, there were changes in the comparative advantage patterns in the ASEAN+3 countries. According to V. V. Gavrilov (2011), the international capital acquisitions and security of the export markets remained crucial to the growth of the ASEAN countries. In this respect, the countries that were the most significant for the ASEAN countries were the three countries in East Asia, because they had economic and financial resources to provide the aid they needed.

## CONCLUSION

This paper investigates the impact of FDI and exports on economic growth for the ASEAN+3 countries, which include Malaysia, Myanmar, the Philippines, Singapore, Thailand, Vietnam, Brunei Darussalam, Cambodia, Indonesia, the People's Democratic Republic of Lao, the People's Republic of China, Japan, and Korea. The results of this study demonstrate that

the ASEAN+3 countries demonstrate the FDI-led and export-led growth hypotheses (thus supporting the hypotheses 1 and 2), which means that FDI and exports are crucial in boosting the economic growth of the ASEAN+3 countries.

In attracting FDI, ASEAN has been considered as successful. In recent years, it has been competing with China as the largest FDI investment destination in the developing world. It is important to understand that FDI is an integral part of the global economy and that they will be built further in parallel with the social and economic development process of the ASEAN+3 countries. The policymakers in the ASEAN+3 countries need to establish the policies that create conducive environments for FDI by improving the Ease of Doing Business (EoDB). A favorable environment will be created so as to attract FDI, especially from the main companies in the ASEAN+3 countries. Due to the lack of domestic workforce with a technological potential, however, there are obstacles to attracting FDI. Therefore, an extended period of time is needed to improve human capital. In order to enable the private sector and foreign investors to spend more funds on the emerging industries, labor policies should be implemented.

Furthermore, Intra-ASEAN merchandise trade had robustly grown, which was followed by equally robust growth in trade with non-ASEAN trading partners, especially so with China, Japan and the Republic of Korea (Chen & Intal, 2017). The ASEAN+3 countries boost the ability of small-scale enterprises to have greater opportunities to legally manufacture unlimited amounts for export. Therefore, the ASEAN+3 countries need to launch the policies that remove the trade, fiscal and financial barriers that restrict export. These policies also have to develop human capital and eliminate inefficiencies and develop the other activities that promote economic growth. Additionally, these policies should balance between enhancing the export of modern services as the new growth engine, on the one hand, and maintaining a contribution to the travel and transportation sectors as the main sectors of the Association of Southeast Asian Nations.

This study has several limitations that future studies should overcome. First, this study only focuses on the relationships between the three macroeconomic variables (economic growth, FDIs, and exports). It is suggested that future research studies should use more variables in the analysis, such as imports, transfers of new technologies and labor force from bilateral or multilateral cooperation (ASEAN+6, BRICS, EMU, and OECD). Second, this study only analyzes the macroeconomic data of the thirteen countries during the period from 2008 to 2018. Therefore, future studies are expected to include longer observation periods covering the major global economic events, such as the 1997 Asian crisis and COVID-19. Third, this paper only employs the standard panel data model. It is suggested that, as such, future research studies should expand the model by using dynamic panel data, panel granger causality and others.

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## PONOVNO SAGLEDAVANJE HIPOTEZE O RASTU NA OSNOVU STRANIH DIREKTNIH INVESTICIJA I IZVOZA U ZEMLJAMA ASEAN+3

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U ovom radu se istražuju efekti stranih direktnih investicija (SDI) i izvoza na ekonomski rast u zemljama Saveza nacija jugoistočne Azije plus tri (ASEAN+3). U radu su analizirani panel podaci, za ukupno 13 zemalja, tokom perioda 2008-2018. Na osnovu rezultata dobijenih primenom testa Lagranžovog množioca (LM), zaključuje se da podaci odgovaraju modelu nasumičnih efekata. Slično tome, Valdov test ne ukazuje na postojanje problema endogenosti u samom modelu. Rezultati Hausmanovog i Čauovog testa, takođe, pokazuju da model nasumičnih efekata predstavlja najefektivniji model za opisivanje učinaka stranih direktnih investicija i izvoza za rast. Rezultati dokazuju da strane direktne investicije pozitivno utiču na ekonomski rast. Dodajmo tome i to da izvoz, takođe, ima pozitivan i značajan učinak na ekonomski rast. U suštini, ovaj rad, iskustveno, potvrđuje rast zasnovan na stranim direktnim investicijama i izvozu. Zaključujemo da nalazi do kojih se u radu došlo ukazuju na činjenicu da su strane direktne investicije i izvoz od značaja za podsticanje ekonomskog rasta zemalja saveza ASEAN+3. Region ASEAN+3 i nadalje ostaje privlačna destinacija za međunarodne kompanije širom sveta, kada su u pitanju strane direktne investicije i trgovina

**Ključne reči:** ASEAN+3, strane direktne investicije, izvoz, rast, panel podaci

JEL Classification: F15, F20



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## DOES EARNINGS MANAGEMENT EXERT PRESSURE ON FIRMS' RETURN ON ASSETS AND EQUITY? THE CASE OF SUB-SAHARAN AFRICA

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Regardless of the viewpoints of prior studies on earnings management, no study has been carried out on whether earnings management exerts pressure on firms' return on assets and equity, particularly in Sub-Saharan Africa in a single study. Drawing inferences from the existing earnings management models, a dissimilar model of earnings management, unlike those used in prior studies, which may match the peculiarity of Sub-Saharan Africa is developed in this paper. The data used were obtained from the Stock Exchange database of Sub-Saharan African countries by employing the fixed and random effects statistical technique. Using the proposed earnings management model, the study finds the intriguing results that may contribute to knowledge and magnify the literature that, notwithstanding the fact that earnings management exerts significant pressure on firms' performances, it is even more so deemed as high in South Africa, only to be followed by West Africa, and low in East Africa. Interestingly, the study finds that the size of a firm plays a vital role in moderating the nexus between the earnings management and performances of Sub-Saharan African firms.

**Keywords:** earnings management, return on assets, return on equity, financial statements, Sub-Saharan Africa

JEL Classification: M41, M48

### INTRODUCTION

In the accountancy literature, there is robust empirical evidence on earnings management, with various phrases used to depict the concept such as income smoothing, accounting hocus-pocus,

aggressive accounting, engineering accounting, and creative accounting, among others. Conceivably, the widespread literature on earnings management may be associated with the varied usage of earnings management phrases together with cravings by firms to beat earnings management practices. Interestingly, the literature on earnings management is staggered by remarkable, but divergent results (Jones, 1991; Dechow, Sloan & Sweeney, 1995; Zunera,

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Farah & Muhammad, 2015; Gnyana, 2016; Cole, 2017; Grimaldi, 2019; Thenmozhi, Saravanan & Sasidharan, 2019; Boghdady, 2019; Augustia, Muhammad & Permatasari, 2020; Ali, Ismael & Ahmed, 2020; Hunjra, Perveen, Chani & Mehmood, 2020).

As R. E. Verrecchia (2009) sees it, earnings management infers the corporate entities assuming that the accounting measures of performance precisely replicate real performance, and do not assess the traits of accounting measures to assess whether that is actually the case. Alluding to the viewpoint expressed by R. E. Verrecchia (2009), earnings management denotes a seemingly magical process of transforming accounting figures into financial statements by management in order to disclose high-quality earnings. For instance, using fair value in determining accounting figures provides the users of financial statements with better information compared to the historical cost. However, there is a standpoint that fair value accounting decreases income when values decrease, on the one hand, and increases income volatility when value increases. Impliedly, accounting choices and methods (e.g. fair value) by firms may not portray real performance, so that it may have a significant impact on the usefulness of financial statements for users.

F. Dobre, L. Brad and R. Ciobanu (2015) and R. B. Gnyana (2016) remark that, as opportunism is circumscribed by the accounting regulatory framework for the accounting choices and methods to circumvent earnings management practices, there is much recent evidence that firms engage themselves in negative earnings management practices in order to disclose superior performance. The views expressed by F. Dobre *et al* (2015) and R. B. Gnyana (2016) are corroborated by positive accounting thinkers, such as R. L. Hagerman and M. E. Zmijewski (1979) and R. L. Watts and J. L. Zimmerman (1986), who advocate numerous rationales why management engage themselves in earnings management.

Predominant among the rationales comprised the disclosure of a superior management bonus (Gaver, Gaver, & Austin, 1995), tumbling the probability of the bond-covenant breach and contractual outcomes

(DeFond & Jiambalvo, 1994; Ball & Shivakumar, 2006; Barth, Landsman & Lang, 2008) and slashing regulation and political scrutiny (Jones, 1991). More worrisome is how these may distort the stakeholders' perception of the underlying economic performance of the financial position of firms (Bartov, Gul & Tsui, 2000; Kothari, Leone & Wasley, 2005). Plausibly, there are two divides to earnings management, namely positive (which does not distort the underlying economic performance of firms) and negative (a repetition to avoid 'reporting red-ink') (Burgstahler & Dichev, 1997; Barth, 2010; Cole, 2017; Grimaldi, 2019; Thenmozhi *et al*, 2019; Hunjra *et al*, 2020)

Worthy of note is the fact that, regardless of the viewpoint of prior studies on earnings management, there has been no study on whether earnings management will exert pressure on firms' return on assets and return on equity, particularly in Sub-Saharan Africa in a single study. Drawing inferences from the existing models for detecting the application of earnings management by J. Jones (1991) and P. M. Dechow *et al* (1995), a dissimilar model for detecting earnings management, unlike those used in prior studies, which may match the peculiarity of the firms in Sub-Saharan Africa, is developed in this paper.

Using the proposed models for detecting earnings management advocated in this study, more intriguing results that will contribute to knowledge and magnify the literature on earnings management are offered, which requires the empirical scrutiny that the study attempts to satisfy. Thus, secondary data as its scientific instrument and the ordinary least square and fixed and random effects in assessing whether earnings management exerts pressure on the two indicators of performance (namely return on assets and return on equity) in the selected nations of Sub-Saharan Africa (Western - Nigeria), (Southern - South Africa) and (Eastern - Kenya) are used in the paper. The paper is structured as follows: Section 2 - Literature Review and Hypotheses Development, Section 3 - Theoretical Framework, Section 4 Data and Methods, Section 5 Results, Section 6 - Discussion and Section 7 - Conclusion.

## LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

### Return on Assets

Undeniably, an entity's performance is predisposed to the level of earnings management by means of accrual accounting. Return on assets (ROA) is the fundamental performance metrics resulting from accrual accounting. Usually, ROA is estimated on the basis of net income divided by the total assets or the ratio of operating income to the total assets. These forms of estimations, however, have been broadly employed in the literature on earnings management (Kothari *et al*, 2005; Ayers, Jiang & Yeung, 2006; Lennox & Park, 2006; Gong, Li & Xie, 2008; Moradzadehfard & Nazari, 2013; Elshafie & Nyadroh, 2014; Dobre *et al*, 2015; Cole, 2017).

G. Gong *et al* (2008) find a significant positive association between earnings management and ROA, suggesting that entities management seems to over-extrapolate the past performance in forecasting future earnings. According to G. Gong *et al* (2008), high (low) earnings may result from superior (poor) ROA and the neutral application of accounting conventions and principles rather than the proactive choices made by the management with respect to the accounting methods striving to convey their personal judgment about the prospects the entity has. Besides, the majority of the studies on earnings management have included the performance metrics of ROA in their empirical models, claiming that ROA is one of the major performance metrics influenced by earnings management. Given the submission and empirical results of prior studies, ROA was included in our model. Hence, it was hypothesized as follows:

H1: Earnings management exerts no significant pressure on a firm's return on assets.

### Return on Equity

Return on equity (ROE) is the reported performance that shareholders resort to when assessing how efficient management has performed over years.

From shareholders' point of view, particularly from the point of view of internal stakeholders, retained earnings are a better source of funds than outside financing. ROE is the measure of the performance of an entity and the same is estimated as the value of the net income returned as a percentage of the shareholders' equity (the ratio of the profit after tax to equity). ROE shows how much of a profit entities generate from each monetary unit invested by the shareholders.

ROE has not been deeply used in the literature on earnings management. However, there are but the few studies (Rangan, 1998; Teoh & Wong, 1998; Boghdady, 2019) that have used these performance metrics. Moreover, prior studies find the evidence that earnings management significantly affects ROE. A study by S. Rangan (1998) and a study by M. A. Ali, H. R. Ismael and A. H. Ahmed (2020) find the evidence that equity-issuing entities on average tend to have greater positive accruals in the years surrounding the issue and these accruals can partially affect performance to such an extent that management are made to employ earnings management. Contrary to the results achieved by S. Rangan (1998), S. H. Teoh *et al* (1998) and A. B. A. Boghdady (2019) find the evidence that a negative association between accruals and ROE is more obvious for current accruals than for the total accruals. Based on these empirical results, ROE is included in our empirical model. Thus, the second hypothesis reads as follows:

H2: Earnings management does not exert significant pressure on a firm's return on equity.

## THEORETICAL FRAMEWORK

In this paper, the theoretical underpinning is on the Theory of Accounting Discretion (TAD). TAD is a new theoretical archetype proposed by researchers, describing how management employ their Freedom of Choice (FOC) or Private Judgment (PJ) in adjusting entities' cashflows. When the adjustment of a firm's cashflow is concerned, the FOC or the PJ offer management diverse accounting treatments

and management techniques aimed at reporting accounting figures in financial statements in such a way that they reflect high-quality earnings for the firm. The discretion used by the management of an organization is usually created in compliance with the International Financial Reporting Standards (IFRS), which permit management to employ the dissimilar choices of and methods for accounting judgments in adjusting cashflows. The discretions accorded by the IFRSs are the drivers of earnings management.

The underlying philosophy of TAD is that an entity's cashflows are adjusted based on a human judgment, a personal decision and a normative choice. Consequently, the characteristics of a firm, such as its size, management interests and ownership structure, as well as other characteristics, should be considered as the fundamental elements of earnings management. The characteristics of a firm accord management with flexible opportunities to experiment or transform accounting figures. More importantly, TAD is a normative accounting theory that describes the diverse accounting choices and methods used by management since it informs us about how management employs discretion in reporting theoretical performance rather than real performance. However, it totally deviates from the perspective of positive accounting theory, where the prime concern deals with accounting judgment aimed at disclosing real performance.

## DATA AND METHODS

In this paper, an ex post facto design was adopted. The design was adopted since the study seeks to establish the variables connected with a certain occurrence by studying the past events of the existing condition. According to F. Nachmias and D. Nachmias (2009), the design supports the fact that the variables (e.g. earnings management, return on assets and return on equity) employed in an ex post facto study cannot be manipulated since the event already exist. The study population comprised all the publicly quoted consumer and industrial goods companies on the recognized Stock Exchanges of Sub-Saharan Africa

- Western (Nigeria), Southern (South Africa) and Eastern (Kenya).

In Nigeria, there are 41 publicly quoted consumer and industrial goods firms (Nigerian Stock Exchange, 2018), 23 in Kenya (Nairobi Securities Exchange, 2018) and 77 in South Africa (Johannesburg Stock Exchange, 2018), which makes a total of 141 publicly quoted consumer and industrial goods firms in the selected Sub-Saharan African countries.

A stratified random sampling technique was adopted. Sub-Saharan Africa was divided into the four regions: West Africa, South Africa, East Africa and Central Africa. All the regions of Sub-Saharan Africa are divided into the two strata (based on the robustness of the economy and the viability of the stock exchange), which results in the selection of the three regions/countries of Sub-Saharan Africa (Western: Nigeria, Southern: South Africa and Eastern: Kenya). After having selected the countries based on the robustness of their economies and the viability of their stock exchanges, a judgmental sampling technique was employed.

The employed judgmental sampling was premised on certain yardsticks: first, the most capitalized firms in each selected Stock Exchange of Sub-Saharan Africa were selected; second, the firms with a wide-ranging dataset required for the study were included, while those with an incomplete dataset were excluded, notwithstanding the first yardstick. The judgmental sampling technique became imperative at this stage since the researcher had limited access to the relevant dataset of all the publicly quoted firms of Sub-Saharan Africa.

Given the above frameworks, a total of 29 firms were selected in Nigeria, 56 in South Africa, and 17 in Kenya, totaling 102 firms in the selected countries of Sub-Saharan Africa. With respect to the sampling techniques employed, Central Africa was excluded from the study sample. Hence South Africa was the highest with the sampled firms, only to be followed by Nigeria and, finally, Kenya.

The study data were obtained from a secondary source, more precisely from the Stock Exchange

Fact Books, Annual Reports and Accounts and the Internet websites of the quoted firms operating in the Sub-Saharan African countries. The data comprised the performance measures comprising of Return on Equity (ROE), Return on Assets (ROA), and the earnings management components (net income, earnings before interest and taxes, cashflow from operations, the total assets and revenue) and the control measures (changes in the earnings before interest and taxes, a net profit after tax and the size of the firm). In the paper, a dissimilar model for predicting earnings management different from those employed in the existing studies and peculiar for Sub-Saharan Africa is proposed. Besides, the study drew inferences from the existing models for predicting earnings management proposed by J. Jones (1991) and P. M. Dechow *et al* (1995). Employing both models simultaneously, our earnings management model is given as follows:

$$EMT = \frac{NI - CFO}{TA} + \frac{EBIT - CFO}{REV} \quad (1)$$

where *EMT* is Earnings management, *TA* stands for the total assets, and *REV* means revenue. *NI* is used for net income, *CFO* stands for cashflow from operations, *EBIT* means earnings before interest and taxes. The literature on earnings management suggests that income, expenses and assets should be considered as the most manipulated accounting figures (Gong *et al*, 2008; Moradzadehfard & Nazari, 2013; Abdoli, Bakhtiarneshad & Bakshi, 2012; Elshafie & Nyadroh, 2014; Cole, 2017).

The theoretical basis for the employed empirical model is premised on TAD. Said theoretical paradigm indicates that management may employ FOC when adjusting performance and cashflow, given the diverse accounting choices and methods availing them. J. Jones (1991) shows that a firm's management manipulates expenses/bad debts rather than revenue. Contrarily, P. M. Deschow *et al* (1995) say that the management of a firm manipulate revenue rather than expenses. In light of the said, the model used in this paper for predicting earnings management was re-estimated by incorporating the performance (*OPF*) measures, as shown in equation 2:

$$OPF = \frac{REV(NI - CFO) + TA(EBIT - CFO)}{TA(REV)} \quad (2)$$

Given equations 1 and 2, equations 3-6 were specified so as to validate the relevant hypotheses of the study. The *OPF* denotes performance (return on assets and return on equity).

Earnings Management and Return on Assets (ROA)

$$ROA = f \left\{ \frac{REV(NI - CFO) + TA(EBIT - CFO)}{TA(REV)} \right\} \quad (3)$$

Earnings Management and Return on Equity (ROE)

$$ROE = f \left\{ \frac{REV(NI - CFO) + TA(EBIT - CFO)}{TA(REV)} \right\} \quad (4)$$

In light of the equations 3-4, equations 5-6 are expressed in an explicit form and represented as equations 5-6:

$$ROA_{it} = \alpha_0 + \beta_1 EMT_{it} + \varepsilon_{it} \quad (5)$$

$$ROE_{it} = \alpha_0 + \beta_1 EMT_{it} + \varepsilon_{it} \quad (6)$$

where *i* represents the *i*<sup>th</sup> observation of the dependent and independent variables; *t* denotes the timeframe;  $\alpha_0$  represents an intercept;  $\beta_1$  denotes the slope coefficient;  $\varepsilon$  is the residual (the error term) for the *i*th observation.

In order to control for the relationship between the dependent and the independent variables, the characteristics of the firms (the size of the firm gauged by the total asset logarithm) was introduced, which, according to TAD, offers management flexible opportunities to experiment or transform accounting figures. Likewise, a change in the earnings before interest and taxes ( $\Delta EBIT$ ) and the percentage change in the net profit after tax ( $\Delta NPAT$ ) were introduced as the control variables, resulting in equations 7-8.  $\Delta EBIT$  and  $\Delta NPAT$  were initiated as suggested by M. Riley (2007); G. Gong *et al* (2008) and J. D. Gramlich and O. V. Sorensen (2010), who say that they can be employed to correct the error forecasts made by the

management, linked with the accounting figures. The aggregated earnings management models are presented in equations 7-8:

$$ROA_{it} = \alpha_0 + \beta_1 EMT_{it} + \beta_2 FSIZE_{it} + \beta_3 \Delta EBIT_{it} + \beta_4 \Delta NPAT_{it} + \varepsilon_{it} \quad (7)$$

$$ROE_{it} = \alpha_0 + \beta_1 EMT_{it} + \beta_2 FSIZE_{it} + \beta_3 \Delta EBIT_{it} + \beta_4 \Delta NPAT_{it} + \varepsilon_{it} \quad (8)$$

The study covers the period from 2012 to 2018 for the selected publicly quoted firms in Sub-Saharan Africa. The analysis of the data specifically encompass descriptive statistical tools (the mean, the standard deviation, the minimum and maximum values and the correlation matrix) and inferential statistical tools (the OLS, fixed and random effects, and the Hausman specification test). The analysis was done with the help of the STATA 13.0 version.

## RESULTS

In Table 1, the descriptive results are presented, particularly the mean, the standard deviation, the minimum and maximum values of the analysed variables for Sub-Saharan Africa. The mean earnings management (*EMT*) score included was 20.0658, with the minimum and maximum *EMT* scores of -315.4260 and 422.4490, respectively. Similarly, return on equity (*ROE*), return on assets (*ROA*), the size of the firm (*FSIZE*), a change in the earnings before interest and taxes ( $\Delta EBIT$ ) and a change in the net profit after tax ( $\Delta NPAT$ ) had the mean scores of 44.9141, 19.3859, 46.1513, 0.8410 and -10.5011, respectively.

In addition, the standard deviation values for South Africa (25.8755), West Africa (22.1158) and East Africa (15.3964) supports the reasons why earnings management is predominant among Sub-Saharan African firms, particularly so South Africa (South Africa) and West Africa (Nigeria). Overall, there is a symptomatic significant difference between the mean

**Table 1** The descriptive results of the analyzed variables for Sub-Saharan Africa

Countries	<i>EMT</i>	<i>ROE</i>	<i>ROA</i>	<i>FSIZE</i>	$\Delta EBIT$	$\Delta NPAT$
Mean (Nigeria)	7.0009	15.6704	6.7637	16.1021	0.2934	-3.6638
Mean (South Africa)	8.1911	18.3344	7.9135	18.8394	0.3433	-4.2867
Mean (Kenya)	4.8738	10.9093	4.7087	11.2098	0.2043	-2.5506
Grand Total	20.0658	44.9141	19.3859	46.1513	0.8410	-10.5011
Std. Dev. (Nigeria)	22.1158	104.0443	11.1076	104.0440	1.7094	53.2526
Std. Dev. (South Africa)	25.8755	121.7318	12.9959	121.7315	1.9999	62.3055
Std. Dev. (Kenya)	15.3964	72.4325	7.7328	72.4323	1.1900	37.0729
Grand Total	63.3877	298.2086	31.8363	298.2078	4.8993	152.631
Min. Val. (Nigeria)	-114.0300	-989.3800	-31.6000	-77.3800	-16.7928	-847.5000
Min. Val. (South Africa)	-122.0120	-1058.6400	-33.8120	-82.7966	-17.9683	-906.8250
Min. Val. (Kenya)	-79.3843	-688.7770	-21.9990	-53.8696	-11.6906	-590.0040
Grand Total	-315.4260	-2736.8000	-87.4110	-214.0460	-46.4517	-2344.3290
Max. Val. (Nigeria)	162.7200	1131.0100	61.8700	143.0000	15.4860	43.6451
Max. Val. (South Africa)	146.4482	1097.9100	55.6831	128.7001	13.9374	39.2806
Max. Val. (Kenya)	113.2808	787.3752	43.0720	99.5523	10.7809	30.3844
Grand Total	422.4490	3016.2950	160.6251	371.2524	40.2043	113.3101

Source: Authors

and the standard deviation, which implies significant dissimilarities in earnings management and the performance attributes of Sub-Saharan Africa, which may be a good indicator for assessing the extent to which earnings management may exert significant pressure on the performance measures of the study.

Table 2 accounts for the correlation matrix of the summarized variables. The correlation matrix of the summarized variables reveals that the performance variables (*ROE* and *ROA*) are positively correlated to *EMT*, *FSIZE*,  $\Delta EBIT$  and  $\Delta NPAT$ . According to D. N. Gujarati (2003), when the coefficient of two pairs of explanatory variables exceeds the value 0.8, then multicollinearity is present.

Given the foregoing results, not a single correlation coefficient of the explanatory variables exceeds 0.8. Consequently, the study concludes that there is no multicollinearity at all among the pairs of the explanatory variables. Impliedly, the earnings management, performance and control variables

of the study are suitable for estimating a regression model.

The Shapiro-Wilk *W* data normality test is presented in Table 3, and the values *W* are the Shapiro-Wilk test statistics. S. S. Shapiro and M. B. Wilk (1965), and S. S. Shapiro and R. S. Francia (1972) suggest that the large values of *V* show the non-normality of data. However, the *V* values are small and fall within a range from 1.9 to 1.1, thus indicating the normality of the data. More so, the Prob. *Z* values provide sufficient evidence to accept the hypotheses that *ROE*, *ROA*, *EMT*, *FSIZE*,  $\Delta EBIT$  and  $\Delta NPAT$  are normally distributed.

In Table 4 the results of the OLS, the fixed and random effects of the entire panel data for Sub-Saharan Africa are presented. The result of the testing of the suitability of the models (the ordinary least square - OLS; the fixed effect - FE and the random effect - RE) show that the RE is more efficient than the FE, as is indicated in the result of the Hausman specification test of  $\text{Chi}^2(3) = 0.34$ , *p*-value = 0.9529. The OLS model

**Table 2** The correlation matrix of the Summarized Variables

Variable	ROE	ROA	EMT	FSIZE	$\Delta EBIT$	$\Delta NPAT$
ROE	1.0000					
ROA	0.4680	1.0000				
EMT	0.0487	0.0512	1.0000			
FSIZE	0.0398	0.0234	0.2008	1.0000		
$\Delta EBIT$	0.0706	0.0552	0.0470	-0.0274	1.0000	
$\Delta NPAT$	0.0384	-0.0015	0.0132	0.0326	0.0671	1.0000

Source: Authors

**Table 3** The Shapiro-Wilk *W* data normality test

Variable	Obs.	W	V	Z	Prob. > Z
ROE	612	0.9528	1.9126	0.8310	0.9086
ROA	612	0.9839	1.3454	0.6401	0.2634
EMT	612	0.9533	1.7082	0.7134	0.9055
FSIZE	612	0.9892	1.1113	0.1959	0.4247
$\Delta EBIT$	612	0.9246	1.4449	1.1254	0.8434
$\Delta NPAT$	612	0.9640	1.9915	1.4419	0.2573

Source: Authors

**Table 4** The OLS and the fixed and random effects of the summarized variables for Sub-Saharan Africa

Dependent Variable: Variable	ROA	OLS	FE		RE	
	Coef.	Prob.	Coef.	Prob.	Coef.	Prob.
<i>EMT</i>	0.4463* (18.48)	0.000	0.4640* (18.31)	0.000	0.4463* (18.48)	0.000
<i>FSIZE</i>	0.4035* (16.71)	0.000	0.4195* (16.55)	0.000	0.4035* (16.71)	0.000
$\Delta$ <i>EBIT</i>	0.1823 (0.71)	0.477	0.1966 (0.76)	0.448	0.1823 (0.71)	0.477
$\Delta$ <i>NPAT</i>	0.0780 (0.98)	0.330	0.0072 (0.89)	0.375	0.0078 (0.98)	0.329
R-Squared	0.5910					
R-Squared Adj.	0.5859					
Prob. F.	0.0000					
R-Squared (within)			0.5900		0.5900	
R-Squared (between)			0.8010		0.8073	
R-Squared (overall)			0.5910		0.5190	
Wald Ch2					345.38	
Prob. Ch2					0.000*	
Hausman Test			Chi2(2) = 0.34		Prob>Chi2= 0.9529	

Note: \*significant at 1%; \*\*significant at 5%; the items in parentheses are the t-values; F=115.13

Source: Authors

indicates that the *EMT* has a larger beta coefficient in absolute terms than the other variables (*FSIZE*,  $\Delta$ *EBIT* and  $\Delta$ *NPAT*) do.

Even more so, when the firms in Sub-Saharan Africa engage themselves in earnings management, such an engagement results in an approximately 44.6 percent change in the level of performance (*ROA*), and 40.4%, 18.2% and 7.8% change in the *FSIZE*,  $\Delta$ *EBIT* and  $\Delta$ *NPAT*, respectively. The Wald Ch2-statistics are 345.38, with a p-value 0.000, supporting the hypothesis that earnings management (*EMT*) exerts significant pressure on the return on assets (*ROA*) of the firms operating in Sub-Saharan Africa.

The results of the *OLS* and the fixed and random effects of the entire panel data for Sub-Saharan Africa are presented in Table 5. The results reveal the fact that *RE* is more efficient than *FE*, as is shown in the

Hausman specification test result of Chi2 (3) = 0.44, p-value = 0.9311. The *OLS* model indicates that *EMT* has a greater beta coefficient in absolute terms than the other variables (*FSIZE*,  $\Delta$ *EBIT* and  $\Delta$ *NPAT*) do. Furthermore, the Wald Ch2-statistics are 8.88, with a p-value 0.0309, thus supporting the hypothesis that earnings management (*EMT*) exerts significant pressure on firms return on equity (*ROE*) in Sub-Saharan Africa

## DISCUSSION

In the paper, whether earnings management exerts significant pressure on firms' returns on assets and equity in Sub-Saharan Africa is investigated. Particularly, the findings follow the a priori expectation: first, the study finds that the

**Table 5** The LS and the fixed and random effects of the summarized variables for Sub-Saharan Africa

Dependent Variable: Variable	ROE		FE		RE	
	Coef.	OLS Prob.	Coef.	Prob.	Coef.	Prob.
EMT	0.7950* (2.88)	0.004	0.7918* (2.84)	0.005	0.7950* (2.88)	0.004
FSIZE	0.7187* (2.60)	0.004	0.7158* (2.57)	0.005	0.7187* (2.60)	0.004
$\Delta$ EBIT	1.7199 (0.59)	0.558	0.1851 (0.63)	0.533	1.7199 (0.59)	0.557
$\Delta$ NPAT	0.0209 (0.23)	0.820	0.0120 (0.13)	0.897	0.0209 (0.23)	0.820
R-Squared	0.0358					
R-Squared Adj.	0.0237					
Prob. F.	0.0329					
R-Squared (within)			0.0357		0.0357	
R-Squared (between)			0.0578		0.0986	
R-Squared (overall)			0.0358		0.0358	
Wald Ch2					8.88	
Prob. Ch2					0.0309*	
Hausman Test			Chi2(2) = 0.44		Prob > Chi2 = 0.9311	

Note: \*significant at 1%; \*\*5%; the items in parentheses are the t-ratios; the Z-test in parentheses bold face; F=2.96

Source: Authors

performance variables (*ROA* and *ROE*) are positively correlated with *EMT*, *FSIZE*,  $\Delta$ *EBIT* and  $\Delta$ *NPAT*, thus clearly indicating the fact that the developed earnings management prediction models positively show relationships with the performance variables of the study. Again, the normality test results provide adequate evidence for us to accept that earnings management (*EMT*), the performance variables (*ROE* and *ROE*) and the control variables (*FSIZE*,  $\Delta$ *EBIT* and  $\Delta$ *NPAT*) are normally distributed.

Moreover, the result of the random effect implies that the firms from which the measurements were drawn are not fixed and the variations between the firms in Sub-Saharan Africa may be of interest are perhaps one of the reasons why earnings management may be predominant in the other regions of Sub-Saharan Africa. Furthermore, the t-test result suggests that  $\Delta$ *EBIT* and  $\Delta$ *NPAT* do not account for the

management error forecast linked with accounting figures, as is suggested by G. Gong *et al* (2008) and J. D. Gramlich and O. V. Sorensen (2010), but rather that the size of a firm largely explains changes in the level of performance.

Overall, this study has established the fact that earnings management exerts significant pressure on firms' performances. The results obtained herein are in part similar to the findings of prior studies on earnings management (Gong *et al*, 2008; Dechow, Hutton, Kim & Sloan, 2012; Dobre *et al*, 2015; Gnyana, 2016) that find the significant evidence of a significant positive relationship between earnings management and the performance variables of firms, thus implying an impartial application of the accounting principles, rather than the proactive choices of accounting methods made by management.

First, this study contributes to the accounting literature by reaffirming the position of prior studies on earnings management; second, this study contributes to the accounting literature in that it indicates the fact that, notwithstanding the fact that earnings management does exert significant pressure on firms' return on assets and equity, earnings management is high in South Africa, only to be followed by West Africa, and low in East Africa. Finally, this study contributes to knowledge, indicating the fact that the size of a firm plays a vital role in moderating the relationship between the earnings management and performance (return on assets and return on equity) of Sub-Saharan African firms. This may explain one of the rationales for the predominance of the use of earnings management among Sub-Saharan African firms, particularly those operating in South Africa (South Africa) and West Africa (Nigeria).

## CONCLUSION

Within the milieu of the proposed earnings management model for Sub-Saharan Africa, it is discerned that it is not only earnings management that exerts significant pressure on the ROA/ROE of the firms operating in Sub-Saharan Africa, but the practice of earnings management conducted in these publicly quoted industrial/consumer goods firms in South Africa (South Africa) and Nigeria (West Africa) is also high, whereas that practice is low in Kenya (East Africa), which shows that the West African and South African nations are yet to fully comply with the global accounting principles and standards. Consequently, the South African and West African nations should consider encouraging firms to fully comply with the global principles and standards in order for the magnitude of earnings management to decrease.

The Wald Ch2-statistics for both models indicates the fact that earnings management exerts significant and positive pressure on the returns on asset and returns on equity of the publicly quoted industrial/ consumer goods firms in Sub-Saharan Africa, which, however, is also partly due to the size of the firms. Thus, the

national agency of each nation should offer a more specific accounting guideline on the requirement for and the extent of earnings management practice to be conducted by the publicly quoted industrial/ consumer goods firms and by those quoted in the other sectors so as to ensure the transparency of the capital market and the albeit wrong practice of earnings management by firms in Sub-Saharan Africa.

Furthermore, the research has several limitations in terms of the sector covered and the extension of the study in order for it to cover the other regions of Sub-Saharan Africa. Consequently, future studies should consider investigating the other sectors as well and extend such investigations to the other regions of Sub-Saharan Africa. In fact, the model proposed in this study can be tested in the other regions of Sub-Saharan Africa. These limitations further open the questions as to whether earnings management may exert significant pressure on firms in the other sectors and regions of Sub-Saharan Africa.

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## DA LI UPRAVLJANJE ZARADAMA VRŠI PRITISAK NA PRINOS NA UKUPNU IMOVINU I KAPITAL PREDUZEĆA? STUDIJA SLUČAJA PODSAHARSKE AFRIKE

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Uprkos stanovištima izloženim u prethodnim studijama, koje su se bavile pitanjem upravljanja zaradama, nije urađena nijedna studija u kojoj bi se istraživala pitanja da li upravljanje zaradama vrši pritisak na prinos na ukupnu imovinu i kapital preduzeća, a naročito ne postoji nijedna studija koja bi se tim pitanjem bavila u kontekstu Podсахarske Afrike. Izvodeći zaključke iz postojećih modela za upravljanje zaradama, u ovom radu je razvijen jedan drugačiji model upravljanja zaradama, koji se razlikuje od modela korišćenih u ranijim studijama, a koji se, možda, uklapa u specifičnosti miljea Podсахarske Afrike. Podaci su pribavljeni iz baze podataka Berze zemalja Podсахarske Afrike, upotrebom statističke tehnike stalnih i nasumičnih efekata. Koristeći predloženi model za upravljanje zaradama, studija dolazi do intrigantnih rezultata, koji, moguće je, doprinose saznanjima i daju svoj doprinos literaturi, bez obzira na činjenicu da upravljanje zaradama vrši značajan pritisak na performanse preduzeća. Štaviše, upravljanju zaradama se pridaje veliki značaj u Južnoj i Zapadnoj Africi, dok mu se mali značaj pridaje u Istočnoj Africi. Zanimljivo je to što se u studiji došlo do saznanja o tome da veličina preduzeća igra vitalnu ulogu u posredovanju u vezi između upravljanja zaradama i performansi preduzeća koja posluju u Podсахarskoj Africi.

**Ključne reči:** upravljanje zaradama, prinos na ukupnu imovinu, prinos na kapital, finansijski izveštaji, Podсахarska Afrika

JEL Classification: M41, M48



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# PERFORMANSE DINAMIČKIH I STATIČKIH INVESTICIONIH STRATEGIJA U PENZIJSKIM FONDOVIMA

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Članovi penzijskih fondova sredstva akumuliraju regularnim uplatama doprinosa u unapred definisanim intervalima i investiranjem akumuliranih sredstava izborom jedne od investicionih strategija koje su na raspolaganju u penzijskim fondovima. Nakon Svetske ekonomske krize iz 2009, aspekt očuvanja vrednosti akumuliranih sredstava postao je naročito važan u penzijskim fondovima, što je uticalo na proces izbora investicione strategije njegovih članova. Statičke investicione strategije, u uslovima rastućih fluktuacija na finansijskom tržištu, ne predstavljaju zadovoljavajuće rešenje za osiguranike u penzijskim fondovima, imajući u vidu odsustvo reakcije na učestale fluktuacije na finansijskom tržištu. U radu je izvršena komparativna analiza performansi dinamičkih i statičkih oblika strategije životnog ciklusa, korišćenjem *bootstrap* reuzorkovanja za simuliranje investicionih prinosa i VaR pokazatelja za procenu rizika realizacije nepovoljnog finansijskog rezultata u trenutku penzionisanja. Rezultati analize pokazuju da dinamičke strategije životnog ciklusa generišu povoljnije finansijske rezultate u odnosu na statičke strategije životnog ciklusa, uz neznatno veću verovatnoću realizacije ekstremno nepovoljnih ishoda.

**Ključne reči:** dinamičke investicione strategije, statičke investicione strategije, penzijski fondovi, strategija životnog ciklusa, *bootstrap* reuzorkovanje

JEL Classification: G11, G17, J26, J32

## UVOD

Osnovni cilj koji pojedinci žele da ostvare učešćem u penzijskom fondu je formiranje novčanog iznosa u momentu penzionisanja koji će biti dovoljan za isplatu zadovoljavajućeg iznosa penzija do kraja njihovog života. Konačan iznos na penzijskom računu zavisi od

nivoa doprinosa uplaćivanih u toku radne karijere, ali i od načina na koji se akumulirana sredstva investiraju na finansijskom tržištu. Ukoliko se zanemare aspekti transakcionih troškova i oporezivanja različitih segmenata penzijske štednje, većina ekonomista se slaže da je izbor investicione strategije najvažniji faktor koji određuje prinos investicionog portfolija u dugom roku.

Statičke investicione strategije su često korišćene od strane članova penzijskih fondova. Primena ovih

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strategija podrazumeva manji ili veći stepen odsustva prilagođavanja portfolija kratkoročnim promenama na finansijskom tržištu, sa ciljem formiranja vrednosti u dužem vremenskom periodu, a ne u kratkom roku. Shodno tome, jasno je zašto su se upravo članovi penzijskih fondova, sve do kraja XX-og veka, pretežno opredeljivali za primenu ovih investicionih strategija. Međutim, u prvoj deceniji XXI-og veka dve finansijske krize su, u relativno kratkom vremenskom periodu, značajno uticale na pad iznosa penzijske štednje (*dot.com* kriza iz 2001, i Globalna finansijska kriza iz 2008. godine). U ovom periodu, primenom statičkih strategija, mnogi članovi penzijskih fondova su ostvarili izražene gubitke bez mogućnosti značajnije korekcije u nivou akumuliranih sredstava do penzionisanja. Novonastale okolnosti su ukazale na potrebu za primenom dinamičkih investicionih strategija, koje su usmerene ka višedecenijskom vremenskom horizontu, ali uz ugrađenu fleksibilnost prema promenljivim uslovima investicionog ambijenta.

Primena dinamičkih strategija podrazumeva periodično prilagođavanje strukture portfolija promenama u cenama finansijskih instrumenata, u cilju povećanja verovatnoće realizacije ciljanog novčanog iznosa u trenutku penzionisanja. Kod statičkih investicionih strategija, u najčistijem obliku, ova mogućnost je isključena, jer se početna struktura portfolija utvrđuje u skladu sa dugoročnim finansijskim ciljevima i tolerancijom prema riziku investitora, a prilagođavanja portfolija se realizuju po automatizmu, prema unapred utvrđenom pravilu. Iz perspektive troškova primene investicione strategije, statičke strategije su privlačnije za individualne investitore, s obzirom da ne moraju da se angažuju u procesu kontinuirane analize informacija o tržišnim kretanjima i procene performansi portfolija. Jednostavnost i niski troškovi primene predstavljaju i dve najveće prednosti statičkih investicionih strategija iz perspektive individualnih investitora.

U domenu praktične primene, investicione strategije sa sličnim ciljevima i konceptualnim karakteristikama mogu da budu formirane i kao statičke i kao

dinamičke, u zavisnosti od toga da li postoji ugrađena povratna sprega ka finansijskom tržištu. Strategija životnog ciklusa predstavlja investicionu strategiju koju osiguranici u penzijskim fondovima sve češće primenjuju, s obzirom da je koncipirana sa fokusom na višedecenijski investicioni horizont i promenljiv profil tolerantnosti investitora prema riziku sa protokom vremena. Ova strategija može imati i statički i dinamički karakter. Bez obzira da li je reč o statičkom ili dinamičkom pojavnom obliku, osnovna karakteristika strategije životnog ciklusa je izloženost individualnog investitora agresivnim ulaganjima u akcije na početku radne karijere, a zatim postepena tranzicija ka konzervativnim ulaganjima (kompanijske i državne obveznice i kratkoročne hartije od vrednosti), kako se bliži trenutak penzionisanja. Ukoliko se prilagođavanje portfolija vrši prema unapred definisanom pravilu, strategija ima statički karakter, a ukoliko se prilagođavanja vrši na osnovu analize tržišnih kretanja i performansi različitih vrsta finansijskih instrumenata, strategija dobija dinamički karakter.

Shodno navedenom, predmet istraživanja u radu se odnosi na performanse dinamičkih i statičkih investicionih strategija koje primenjuju članovi penzijskih fondova. Polazna tačka istraživanja se odnosi na ispitivanje da li dinamičke investicione strategije mogu da generišu superiornije finansijske rezultate u dugom roku u odnosu na statičke investicione strategije. S obzirom na rastući značaj strategije životnog ciklusa u penzijskim fondovima, pitanje efikasnosti različitih statičkih i dinamičkih pojava oblika strategije životnog ciklusa, u realizaciji ciljanog iznosa finansijskih sredstava u trenutku penzionisanja, predstavlja interesantno istraživačko područje.

Imajući u vidu definisani predmet istraživanja, cilj istraživanja je utvrđivanje verovatnoće da će članovi penzijskih fondova ostvariti povoljnije finansijske rezultate primenom dinamičkih u odnosu na statičke investicione strategije, kao i kvantifikacija realizovanog viška finansijskih sredstava i rizičnosti ostvarenih rezultata.

U skladu sa definisanim predmetom i ciljem istraživanja, definisane su dve istraživačke hipoteze:

- H1: Primenom dinamičkih investicionih strategija, članovi penzijskog fonda mogu da ostvare povoljnije finansijske rezultate u odnosu na rezultate ostvarene primenom statičkih investicionih strategija.
- H2: Dinamičke investicione strategije su rizičnije u odnosu na statičke investicione strategije, iz perspektive povećane verovatnoće realizacije ekstremno nepovoljnih finansijskih rezultata.

Istraživanje u radu je pretežno empirijski orijentisano, s obzirom na primenu simulacionih tehnika karakterističnih za ovu istraživačku oblast na podacima o prinosima akcija i obveznica u višedecenijskom vremenskom periodu. S tim u vezi, u radu dominiraju kvantitativne istraživačke metode, korišćene u cilju simuliranja finansijskih rezultata, njihove kvantifikacije i analize rizičnosti.

Doprinos istraživanja ogleđa se u dopuni postojećih, pretežno stranih istraživanja koja se odnose na primenu investicionih strategija u penzijskim fondovima. Prema dostupnim podacima, do sada na teritoriji Republike Srbije nisu vršena istraživanja koja se detaljnije bave problematikom izbora investicionih strategija od strane članova penzijskog fonda. Dobijeni rezultati mogu da budu od koristi za investicione menadžere penzijskih fondova i druga lica u društvima za upravljanje penzijskim fondovima odgovorna za formiranje i oblikovanje skupa investicionih opcija koje su na raspolaganju članovima penzijskih fondova.

Pored uvoda i zaključka, rad čine četiri logički povezana dela. U prvom delu rada su predstavljeni teorijski stavovi značajni u oblasti primene statičkih i dinamičkih investicionih strategija u penzijskim fondovima. Drugi deo rada odnosi se na prikaz rezultata i doprinosa prethodno sprovedenih empirijskih istraživanja u posmatranoj oblasti. Treći deo rada odnosi se na metodologiju istraživanja. Četvrti deo rada obuhvata rezultate empirijskog istraživanja i diskutuju rezultata.

## TEORIJSKA I EMPIRIJSKA OSNOVA

Istraživanja u radu fokusirana su na primenu statičkih i dinamičkih oblika strategije životnog ciklusa. Primenom strategije životnog ciklusa, obezbeđuje se rast vrednosti portfolija u početnim godinama učešća u penzijskom fondu i očuvanje vrednosti portfolija u periodu pre penzionisanja. Pristalice primene ove strategije naročito ističu argument očuvanja vrednosti u periodu neposredno pre penzionisanja, s obzirom da posledice realizacije negativnih stopa prinosa u tom periodu teško mogu da se otklone do trenutka penzionisanja. B. Malkiel (1990) ističe da se sposobnost pojedinca da apsorbuje rizik smanjuje sa starenjem, tako da portfolio treba da bude rastuće konzervativan sa protokom vremena. Mladi investitori mogu da apsorbuju veći nivo finansijskih rizika, usled činjenice da su na početku radne karijere, a vremenski period do trenutka penzionisanja je dugačak. Dodatno, verovatnoća da će mladi pojedinci ostvariti povećanje zarade u budućnosti je veća u odnosu na starije pojedince, što predstavlja argument za veću agresivnost prilikom investiranja.

Veliki broj istraživanja pokazuje da su prinosi od akcija u dugom roku superiorniji u odnosu na prinose od obveznica (Jagannathan i Kocherlakota, 1996; Campbell i Viceira, 2002; Siegel, 2008). Iz perspektive ovog argumenta, mlađi osiguranici treba više da investiraju u akcije, jer je vremenski period do trenutka penzionisanja dug, a u tom vremenskom periodu se rizik značajnog pada vrednosti akcija u pojedinim godinama može značajno smanjiti (Luković i Marinković, 2019, 147). S obzirom da stariji osiguranici nemaju dug vremenski period pred sobom na raspolaganju, agresivna ulaganja za njih nisu pogodna, već je poželjna orijentacija ka državnim i kompanijskim obveznicama.

U poslednje dve decenije, nivo primene strategije životnog ciklusa u penzijskim fondovima je naročito porastao. Prema podacima Vanguard-a (2018), jedne od najvećih kompanija za upravljanje penzijskim fondovima u svetu, u 2017, 92% penzijskih fondova pod njihovom kontrolom imalo je u ponudi investicionih opcija neki od oblika strategije životnog ciklusa. Poređenja radi, 2000. godine samo jedna

trećina penzijskih fondova, kojima je upravljao Vanguard, imala je formirane strategije životnog ciklusa u skupu investicionih alternativa ponuđenih osiguranicima.

Važno je istaći da efekti koje stope prinosa imaju na konačan iznos sredstava koji akumulira član penzijskog fonda, nisu isti u različitim fazama njegovog životnog ciklusa. A. Basu i M. Drew (2009) ističu da veličina efekta koji pozitivne stope prinosa imaju na konačan iznos u trenutku penzionisanja zavisi od veličine portfolija. S obzirom da portfolio raste sa protokom vremena, usled priliva investicionih prinosa i uplaćenih doprinosa, visoke stope prinosa u periodu pre penzionisanja značajno više doprinose realizaciji ciljanog iznosa sredstava u odnosu na iste stope prinosa na početku radne karijere. Iz perspektive ovog argumenta, automatizovana tranzicija od agresivnih ka konzervativnim ulaganjima, sa približavanjem momenta penzionisanja, može da bude neadekvatna.

Statičke strategije životnog ciklusa (SSŽC) imaju ugrađeno automatizovano pravilo, prema kojem se vrši prilagođavanje portfolija sa protokom vremena. Prema D. Blake-u, A. Cairns-u i K. Dowd-u (2001), primenom SSŽC može da se smanji verovatnoća realizacije nepovoljnih ishoda, kao i fluktuacije konačnog iznosa sredstava u momentu penzionisanja, ali uz odricanje od rasta vrednosti koji pružaju agresivne strategije. Dakle, ove strategije nisu adekvatne za sve pojedince, već, pre svega, za pojedince koji nekoliko godina pre penzionisanja žele da raspoložu relativno tačnom procenom novčanog iznosa koji će moći da koriste u periodu nakon penzionisanja.

Veliki nedostatak primene SSŽC leži u prethodno pomenutom automatizmu u prilagođavanju portfolija. Investitor može da se suoči sa produženim trendom pada cena akcija, usled čega je vrednost portfolija značajno niža od očekivane, a primena statičke strategije zahteva transfer ka konzervativnim ulaganjima, koja generišu niske prinose. Na taj način, investitor ne može da realizuje ciljani novčani iznos do planiranog trenutka penzionisanja. Jedini način da investitor poveća vrednost portfolija, u godinama

neposredno pre penzionisanja, je agresivno ulaganje na tržištu akcija, čega se, praćenjem ove strategije, odrekao.

Za dinamičke strategije životnog ciklusa (DSŽC) karakteristična je ugrađena fleksibilnost u prilagođavanju portfolija, u zavisnosti od stepena u kojem je, primenom strategije, realizovan ciljani iznos sredstava. Prema tome, buduće promene u strukturi portfolija zavise od performansi finansijskog tržišta u prošlosti. Agresivnost ulaganja u početnim godinama radne karijere je zajednička kako za dinamičke, tako i za statičke strategije životnog ciklusa. Međutim, prelazak ka konzervativnim ulaganjima u kasnijoj fazi životnog ciklusa nije automatizovan, kao što je slučaj kod statičkih strategija, već će se desiti samo pod uslovom da je pojedinac akumulirao iznos veći, ili jednak planiranom do tog vremenskog trenutka. Ukoliko je iznos sredstava niži od očekivanog, osiguranik će da nastavi sa agresivnim ulaganjima do narednog trenutka procene performansi investicione strategije. Treba istaći da prilagođavanje portfolija ne mora da bude konačnog karaktera, to jest, postoji mogućnost ponovnog vraćanja ka pretežnom ulaganju u akcije, ukoliko je akumulirani iznos u narednom periodu niži od ciljanog iznosa.

## PREGLED EMPIRIJSKIH ISTRAŽIVANJA

Interesovanje za analizu performansi dinamičkih i statičkih investicionih strategija u penzijskim fondovima postalo je naročito izraženo nakon Svetske finansijske krize iz 2009, koja je za posledicu imala značajan pad iznosa penzijske štednje. Povećana primena strategije životnog ciklusa je upravo proistekla iz sve naglašenije potrebe osiguranika da se zaštite od rizika realizacije negativnih stopa prinosa.

Veliki broj istraživanja pokazuje da, primenom SSŽC, članovi penzijskog fonda mogu da smanje rizik realizacije nepovoljnih ishoda i fluktuacije novčanog iznosa akumuliranog u trenutku penzionisanja (Blake, Cairns & Dowd, 2001; Poterba, Rauh, Venti & Wise, 2006; Antolin, Payet & Yermo, 2010). S druge

strane, određena istraživanja pokazuju da SSŽC, u uslovima povećanih fluktuacija na finansijskom tržištu, može da bude neadekvatna za osiguranike u penzijskim fondovima (Basu & Drew, 2010; Basu, Byrne & Drew, 2011).

Većina naučnih radova, koji su ispitivali efikasnost strategije životnog ciklusa, testirali su primenu ovih strategija na teritoriji SAD (Poterba *et al*, 2006; Viceira, 2008; Basu & Drew, 2009; Pfau, 2010; Basu, Byrne & Drew, 2011). S obzirom na rastući značaj ove strategije u međunarodnim okvirima, sve je veći broj radova koji primenu ove strategije analiziraju na primeru drugih zemalja (Louw, Schalkwyk & Reyers, 2017; Manor, 2017; Medaiskis, Gudaitis & Mečkovski, 2018). E. Louw, C. van Schalkwyk i M. Reyers (2017), testirali su efikasnost primene strategije životnog ciklusa na primeru Južne Afrike. Autori su izvršili komparativnu analizu performansi strategije životnog ciklusa i balansiranih fondova konzervativnijeg karaktera. Rezultati sprovedene analize pokazuju da strategija životnog ciklusa može da ostvari povoljnije performanse u odnosu na balansirane fondove, kao i da pruži viši nivo zaštite od rizika. Međutim, ovakav rezultat dolazi uz gubitak u potencijalnom rastu konačnog akumuliranog iznosa. Koristan rezultat analize se odnosi i na inicijalnu postavku portfolija, s obzirom da su autori pokazali da, što je veće učešće akcija u početnom portfoliju, to je strategija životnog ciklusa superiornija u odnosu na balansirane fondove.

M. Manor (2017) je performanse strategije životnog ciklusa analizirao na primeru penzijskih fondova u Izraelu. Za merenje rizičnosti, autor je koristio CVaR pokazatelje rizika, a za simulaciju prinosa i ostalih varijabli korišćen je Monte Carlo pristup. U radu je vršeno poređenje petnaest investicionih strategija za šest različitih profila reprezentativnog agenta. Rezultati analize pokazuju da su SSŽC superiornije u odnosu na statičke strategije konstantnog miksa. S druge strane, interesantan je rezultat prema kojem DSŽC generišu povoljnije finansijske rezultate u odnosu na SSŽC, sa nižim učešćem akcija u početnom portfoliju. Autor je izveo zaključak da bi statičke investicione strategije, sa relativno niskim učešćem akcija u portfoliju, koje su najčešće u primeni u Izraelu, trebalo da budu zamenjene dinamičkim

strategijama koje pružaju znatno više stope zamene, uz neznatno povećanje rizika.

Istraživanja u kojima je vršena komparacija finansijskih performansi statičkih i dinamičkih oblika strategije životnog ciklusa su retka. U jednom od značajnijih, A. Basu, A. Byrne i M. Drew (2011) su sprovedli komparativnu analizu dva oblika SSŽC (autori ih definišu kao konvencionalne strategije) i dva oblika DSŽC. Korišćenjem modela reprezentativnog agenta, autori su izvršili simulaciju investicionih rezultata sprovedenjem *bootstrap* reuzorkovanja. Rezultati sprovedene analize pokazuju da su DSŽC značajno superiornije u odnosu na konvencionalne strategije životnog ciklusa, u pogledu iznosa akumuliranih sredstava u trenutku penzionisanja. S druge strane, konvencionalne strategije imaju manje izražen problem ekstremno nepovoljnih finansijskih ishoda u odnosu na dinamičke strategije.

K. Wang (2012) je sproveo komparativnu analizu finansijskih performansi većeg broja različitih investicionih strategija, uključujući jedan pojavni oblik SSŽC i dva pojavna oblika DSŽC, na uzorku od 17 zemalja. Analiza je pokazala da su dinamički oblici strategije životnog ciklusa superiorniji u odnosu na statičke oblike, u pogledu iznosa akumuliranih sredstava. Interesantno je da je rizik nepovoljnog ishoda za DSŽC niži u odnosu na SSŽC, što, prema autoru, sugeriše da primena DSŽC predstavlja poboljšanje u odnosu na primenu tradicionalnih SSŽC.

## IZBOR PODATAKA I PRIMENJENA METODOLOGIJA

U analizi je korišćen pristup reprezentativnog agenta, koji su prethodno koristili A. Basu i M. Drew (2009), A. Basu, A. Byrne i M. Drew (2011) i K. Wang (2012). Reprezentativni pojedinac, koji je u fokusu analize, ima unapred definisane ekonomske i demografske karakteristike. Iz perspektive demografskog profila, pojedinac tokom radnog veka ostaje član istog penzijskog fonda sve do trenutka penzionisanja. Starost pojedinca u trenutku uclanjenja u penzijski

fond, starost u trenutku penzionisanja, a samim time, i dužina radne karijere, unapred su definisani.

Za potrebe utvrđivanja toka finansijskih priliva na penzijski račun, sledeće karakteristike su od značaja:

- nivo zarade u trenutku učlanjenja u penzijski fond -  $Z_0$ ;
- stopa rasta zarade u toku radne karijere -  $s$ ;
- dužina radne karijere, iskazana u godinama -  $N$ ;
- pretpostavljena stopa doprinosa -  $d$ .

Stopa rasta zarade je nepromenljiva, to jest, porast zarade se odvija po istoj stopi tokom celog radnog veka. Dužina radne karijere je fiksirana, uz pretpostavku da je član penzijskog fonda ceo radni vek proveo u istoj kompaniji, odmah po zaposlenju je postao član penzijskog fonda i u kontinuitetu je uplaćivao doprinose sve do penzionisanja.

Stopa doprinosa je fiksna tokom posmatranog vremenskog perioda. Doprinosi se pripisuju sredstvima na penzijskom računu na kraju svakog meseca, dok se pripisivanje investicionih prinosa vrši na kraju svake godine. To znači da će u toku svake godine biti uplaćeno dvanaest mesečnih doprinosa, a zatim se tako uvećana sredstva na penzijskom računu ulažu u investicioni portfolio, uz realizaciju investicionih prinosa na kraju godine. Tako formirana sredstva se ponovo uvećavaju za doprinose i investicione prinose u narednoj godini, sve do penzionisanja. U skladu sa prethodno navedenim, u Tabeli 1 su date vrednosti parametara koje će biti korišćene u daljoj analizi.

Formula koja se koristi za praćenje rasta zarade je sledeća:

$$Z_t = Z_{(t-1)} (1+s),$$

gde je  $Z_t$  zarada u godini  $t$ ,  $Z_{t-1}$  je zarada u godini  $t-1$ , a  $s$  je fiksirana stopa rasta zarade.

Formula koja se koristi za praćenje iznosa sredstava na penzijskom računu na kraju svake godine je:

$$B_t = (B_{(t-1)} + Z_t d_t) (1+r_t) = (B_{(t-1)} + Z_0 (1+s)^{(t-1)} d_t) (1+r_t),$$

**Tabela 1** Vrednosti parametara za simulaciju finansijskog rezultata

Parametar	Oznaka	Početna vrednost
Početno stanje na penzijskom računu	$B_0$	0
Nivo zarade u trenutku učlanjenja u penzijski fond	$Z_0$	40000 novčanih jedinica
Stopa rasta zarade	$s$	3%
Dužina radne karijere	$N$	40 godina
Stopa doprinosa	$d$	10%

Izvor: Autor

gde su  $B_t$  i  $B_{t-1}$  iznosi sredstava na penzijskom računu na kraju godina  $t$  i  $t-1$ ,  $Z_t$  je zarada člana penzijskog fonda u godini  $t$ , na koju se obračunava stopa doprinosa  $d_t$ , dok je  $r_t$  stopa prinosa na portfolio u godini  $t$ . Stopa doprinosa je iskazana procentualno, a stopa prinosa može biti i pozitivna i negativna.

S obzirom da je radni vek osiguranika 40 godina, u trenutku penzionisanja iznos akumuliranih sredstava je jednak:

$$B_{40} = (B_{39} + Z_0 (1+s)^{39} d_{40}) (1+r_{40}).$$

Portfolio u daljoj analizi čine dve vrste finansijskih instrumenata: akcije, kao reprezent rizične finansijske aktive, i dugoročne državne obveznice, kao reprezent bezrizične finansijske aktive. U skladu sa prethodnim napomenama, formirane su četiri investicione strategije.

Prema statičkoj strategiji životnog ciklusa 30-10 (SSŽC 30-10), portfolio je u prvih 30 godina u potpunosti investiran u akcije. Nakon isteka perioda od 30 godina, u narednim godinama se učešće akcija u portfoliju smanjuje linearno za po 10%, uz istovremeno povećanje učešća obveznica za isti procenat. U godini pre penzionisanja, portfolio čine isključivo obveznice.

Statička strategija životnog ciklusa 20-20 (SSŽC 20-20), podrazumeva da je portfolio u prvih 20 godina u potpunosti investiran u akcije. Nakon isteka ovog perioda, u svakoj narednoj godini učešće akcija u portfoliju se smanjuje za 5%, uz istovremeno linearno povećanje učešća obveznica u istom procentu.

Prema dinamičkoj strategiji životnog ciklusa 30-10 (DSŽC 30-10), u prvih 30 godina portfolio je u potpunosti investiran u akcije. Nakon isteka ovog perioda, umesto automatizovanog transfera portfolija od akcija ka obveznicama, promena strukture portfolija zavisi od realizovanog prinosa iz prethodne godine. Ukoliko je prinos akcija iz prethodne godine viši od 10%, portfolio ostaje investiran u akcije. S druge strane, ukoliko je prinos akcija iz prethodne godine negativan i niži od -10%, portfolio se u potpunosti ulaže u obveznice. Konačno, u situaciji kada je prinos akcija u prethodnoj godini u rasponu od -10% do 10%, u strukturi portfolija 50% čine ulaganja u obveznice, a 50% ulaganja u akcije.

Dinamička strategija životnog ciklusa 20-20 (DSŽC 20-20), podrazumeva da se portfolio u prvih 20 godina u potpunosti ulaže u akcije. Nakon isteka ovog perioda, u svakoj od narednih 20 godina, ukoliko je prinos akcija iz prethodne godine viši od 10%, portfolio ostaje investiran u akcije, a ukoliko je prošlogodišnji prinos od ulaganja u akcije negativan i niži od -10%, portfolio se ulaže u celini u obveznice. Konačno, u situaciji kada je prinos akcija u prethodnoj godini u rasponu od -10% do 10%, portfolio se ulaže 50% u obveznice, a 50% u akcije.

S obzirom da portfolio čine dve vrste finansijskih instrumenata, akcije i dugoročne državne obveznice, neophodni su podaci o godišnjim prinosima ovih hartija od vrednosti u višedecenijskom vremenskom periodu. Kao reprezent kretanja na tržištu akcija biće korišćeni godišnji prinosi S&P 500 indeksa, a kao reprezent kretanja na tržištu državnih obveznica biće korišćeni godišnji prinosi američkih državnih obveznica sa rokom dospeća od 10 godina. Podaci o godišnjim prinosima S&P 500 indeksa i američkih dugoročnih državnih obveznica su prikupljeni korišćenjem elektronske baze podataka o prinosima akcija, obveznica i trezorskih zapisa u SAD, koju

periodično ažurira Aswath Damodaran. Podaci su dostupni za period 1928-2017, što znači da je dostupno 89 opservacija o godišnjim prinosima akcija i državnih obveznica. Dužina investicionog horizonta za posmatranog osiguranika sa hipotetičkim karakteristikama je 40 godina. To znači da iz dostupnih podataka o godišnjim prinosima mogu da se formiraju dve nepreklapajuće serije sukcesivnih godišnjih prinosa za period od 40 godina. Bilo koji zaključak, koji se bazira na dve nezavisne serije godišnjih prinosa, ne može da bude dovoljno pouzdan.

Istorijska kretanja prinosa hartija od vrednosti ne predstavljaju pouzdan pokazatelj budućih kretanja prinosa. Shodno tome, prinosi hartija od vrednosti moraju da se utvrde na drugačiji način. Pristup koji se koristi za simuliranje investicionih prinosa je *bootstrap* metod reuzorkovanja, korišćen u većem broju radova koji se bave analizom investicione aktivnosti penzijskih fondova (Basu, Byrne & Drew, 2011; Wang, 2012; Wang, Li & Liu, 2017). Primenom tehnike *bootstrap* reuzorkovanja, na osnovu postojećih podataka o godišnjim prinosima finansijskih instrumenata, vrši se nasumični izbor velikog broja uzoraka od 40 opservacija za svaku vrstu finansijskih instrumenata. Pretpostavka je da su prinosi pojedinačnih vrsta finansijskih instrumenata nezavisno distribuirani sa protokom vremena. Nasumično izvlačenje uzoraka se vrši sa ponavljanjem podataka, što znači da se isti podaci iz osnovne populacije mogu pojaviti i više puta u istom uzorku. Dobijeni vektori prinosa različitih vrsta finansijskih instrumenata se množe odgovarajućim ponderima u portfoliju u cilju generisanja prinosa portfolija za svaku godinu u vremenskom horizontu od 40 godina. Simulirani investicioni prinosi se pripisuju sredstvima na penzijskom računu na kraju svake godine, uz formiranje konačnog iznosa sredstava u momentu penzionisanja. Postupak se ponavlja hiljadu puta za svaku od statičkih i dinamičkih strategija i dobija se populacija od hiljadu simuliranih rezultata za svaku SSŽC i DSŽC.

Komparativna analiza SSŽC i DSŽC se sprovodi poređenjem korespondentnih parova investicionih strategija, to jest, statičke i dinamičke strategije tipa 20-

20 i statičke i dinamičke strategije tipa 30-10. Za svaku od hiljadu simulacija, vrši se poređenje konačnog rezultata za oba para investicionih strategija. Ukoliko je razlika pozitivna, to znači da je DSŽC superiornija u odnosu na SSŽC, a ukoliko je negativna, to znači da se primenom SSŽC ostvaruje bolji rezultat nego primenom DSŽC. Učešće broja simulacija u kojima je DSŽC superiornija u odnosu na SSŽC u ukupnom broju simulacija predstavlja stopu uspešnosti, koja je osnovni kriterijum za poređenje dinamičkih i statičkih strategija životnog ciklusa.

Ukoliko se definiše ciljani iznos, kojim član penzijskog fonda želi da raspolaže u trenutku penzionisanja, može da se utvrdi verovatnoća da će određena strategija dostići, ili nadmašiti ciljani rezultat. S obzirom da za osiguranika nije bitan samo konačan iznos sredstava, već i neizvesnost realizacije istog, u analizi performansi SSŽC i DSŽC su korišćeni pokazatelji rizika nastanka gubitka. U ovom slučaju, gubitak predstavlja nedostajući iznos sredstava za realizaciju ciljanog iznosa u trenutku penzionisanja. Za merenje rizika nastanka gubitka koriste se konvencionalni pokazatelji rizika: vrednost pri riziku (*Value at Risk* - VaR) i pokazatelj očekivanih ekstremnih gubitaka (*Expected Tail Loss* - ETL), pri definisanom nivou poverenja. Izračunavanjem ovih indikatora, preciznije se sagledava ozbiljnost problema realizacije nepovoljnih ishoda svake investicione strategije.

Primena VaR analize podrazumeva izbor nivoa poverenja koji će biti korišćen za komparaciju finansijskog rezultata različitih investicionih strategija. Kao osnova za komparaciju biće postavljen finansijski rezultat, koji se dobija primenom fiksne godišnje stope prinosa od 10%. Ulaganjem u bilo koji od indeksnih fondova Vanguard-a, orijentisanih ka "praćenju" (*tracking*) Standard&Poor's indeksa tržišta akcija, investitor je u prethodnih 10 godina mogao da ostvari prosečnu godišnju stopu prinosa između 11,30% i 16,64% (Vanguard, 2020). S obzirom da su penzijski fondovi usmereni ka realizaciji sigurnih ishoda, ciljana stopa prinosa je postavljena na nešto nižem nivou i iznosi 10%. Primenom godišnje stope prinosa od 10%, u periodu od 40 godina, formira se ciljani iznos akumuliranih sredstava u momentu penzionisanja. Od rezultata dobijenih u procesu

simulacije, oduzima se iznos utvrđen primenom stope prinosa od 10%, a dobijena razlika predstavlja višak, ili manjak sredstava u odnosu na ciljani iznos.

Vrednost pri riziku na određenom nivou poverenja (90%, 95% i 99%) predstavlja procenu mogućeg manjka u odnosu na ciljani iznos sa kojim se suočava član penzijskog fonda. VaR se može definisati kao potencijalno najveći gubitak u određenom vremenskom periodu, pri čemu je verovatnoća da će stvarni gubitak biti veći od te vrednosti veoma mala (Jorion, 2007, 17). U cilju utvrđivanja nivoa vrednosti, pri riziku na određenom nivou poverenja (90%, 95% ili 99%), svi podaci se rangiraju od najmanjih ka najvećim. Zatim, sa odabranim nivoom poverenja ( $1-\alpha$ ), neophodno je pronaći simulirani gubitak koji neće biti prevaziđen u  $1-\alpha$  slučajeva, to jest, gubitak od kojeg je u  $\alpha$  slučajeva simulirani gubitak veći. Odabir višeg nivoa poverenja daje manji broj slučajeva u kojima su gubici veći od nivoa VaR, s obzirom na rast vrednosti pri riziku.

Pored vrednosti pri riziku, biće utvrđen i nivo *Expected tail loss* (ETL), koji se u literaturi može sresti i kao *Conditional Value-at-Risk* (CVaR), ili *Expected shortfall* (ES). ETL mera rizika će biti izračunata na osnovu prethodno utvrđenih nivoa VaR, za nivoe poverenja od 90%, 95% i 99%. S obzirom da VaR predstavlja najnepovoljniji mogući ishod pri određenom nivou poverenja i dužini vremenskog perioda, ETL predstavlja očekivani gubitak nakon prelaska praga VaR, to jest, prosek gubitaka većih od nivoa VaR pri određenom nivou poverenja, koji su ponderisani odgovarajućim verovatnoćama realizacije. S obzirom da se izračunava za gubitke koji su veći od nivoa VaR vrednosti, to znači da će nivo ETL uvek biti veći od nivoa VaR.

## REZULTATI ISTRAŽIVANJA

U Tabeli 2 dat je prikaz deskriptivne statistike za godišnje prinose S&P 500 indeksa i američkih dugoročnih državnih obveznica, u periodu od 40 godina. Prosečan godišnji prinos akcija je viši od prosečnog prinosa državnih obveznica, uz povećanu

standardnu devijaciju kao jednu od mera rizika. Ova serija prinosa se koristi kao uzorak za sprovođenje *bootstrap* reuzorokovanja. Sprovođenjem simulacije, formirano je hiljadu simuliranih serija prinosa akcija i obveznica od 40 opservacija.

Poređenje performansi DSŽC 20-20 i SSŽC 20-20 podrazumeva utvrđivanje viška (manjka) sredstava na penzijskom računu u trenutku penzionisanja, koji

**Tabela 2** Deskriptivna statistika za prinose akcija i državnih obveznica, u periodu 1979-2018.

	Akcije (godišnji prinosi S&P 500 indeksa)	Državne obveznice (godišnji prinos 10-godišnjih američkih državnih obveznica)
Aritmetička sredina	12,94 %	7,61 %
Medijalna vrednost	15,22 %	7,22 %
Maksimum	37,20 %	32,81 %
Minimum	-36,55 %	-11,12 %
Standardna devijacija	15,879%	10,132%
Simetričnost	-0,9334	0,3052
Spljoštenost	1,2643	-0,1487
Broj opservacija	40	40

Izvor: Autor

se u svakoj simulaciji realizuje primenom dinamičke u odnosu na statičku strategiju. Rezultati simulacije viška, realizovanog primenom DSŽC 20-20 u odnosu na SSŽC 20-20, prikazani su u Tabeli 3.

Kao što rezultati pokazuju, prosečan i medijalan višak govore u prilog superiornosti DSŽC 20-20 u odnosu na SSŽC 20-20. Stopa uspešnosti je visoka i iznosi 65,7%, što znači da, u približno 66 od 100 simuliranih slučajeva, član penzijskog fonda može da ostvari povoljniji rezultat primenom DSŽC 20-20 nego primenom SSŽC 20-20. Koeficijent spljoštenosti, koji iznosi približno 13, ukazuje na prisustvo izraženijih "debelih repova" (*fat tails*), u odnosu na normalan raspored verovatnoća, a pozitivna vrednost koeficijenta asimetrije ukazuje da je odsečak sa desne (pozitivne) strane rasporeda verovatnoća izraženiji u odnosu na levi odsečak. Shodno vrednostima mera oblika raspodele, može se zaključiti da je verovatnoća realizacije ekstremnih vrednosti veća nego kod normalnog rasporeda verovatnoća.

U Tabeli 4 prikazana je stopa uspešnosti DSŽC 30-10 u odnosu na SSŽC 30-10. Stopa uspešnosti je visoka i iznosi približno 64%. Prosečan i medijalan višak govore u prilog superiornosti DSŽC 30-10 u odnosu na SSŽC 30-10. Visoka vrednost koeficijenta varijacije, od 259%, sugerise da je reč o raspršenom rasporedu verovatnoća. Pored toga, na osnovu vrednosti koeficijenta spljoštenosti može da se zaključi da raspored simuliranog viška rezultata DSŽC 30-10 u odnosu na SSŽC 30-10 ima problem javljanja izraženijih ekstremnih vrednosti.

**Tabela 3** Rezultati simulacije viška ostvarenog primenom DSŽC 20-20 u odnosu na SSŽC 20-20

	Stopa uspešnosti	Prosečan višak	Maksimalan višak	Maksimalan gubitak	Medijalni višak
DSŽC 20-20 vs. SSŽC 20-20	65,7%	13751223	305962619	-86034025	7081240
	Koeficijent varijacije	Koeficijent (a) simetričnosti	Koeficijent spljoštenosti		
	237,05%	2,476	12,959		
	Percentili				
	5.	10.	90.	95.	
	-22054614	-13775947	50255785	69553026	

Izvor: Autor

**Tabela 4** Rezultati simulacije viška DSŽC 30-10 u odnosu na SSŽC 30-10

	Stopa uspešnosti	Prosečan višak	Maksimalan višak	Maksimalan gubitak	Medijalni višak
	64,1%	11865847	261026859	-81288035	5706873
DSŽC 30-10 vs. SSŽC 30-10	Koeficijent varijacije	Koeficijent (a) simetričnosti	Koeficijent spljoštenosti		
	259,590	2,163	10,865		
	Percentili				
	5.	10.	90.	95.	
	-23991879	-14368908	45458802	67860100	

Izvor: Autor

Verovatnoća uspeha posmatranih strategija u realizaciji ciljanog iznosa sredstava, realizovanog primenom fiksne stope prinosa od 10% u posmatranom periodu od 40 godina, je data u Tabeli 5. Može se uočiti da je strategija sa najvećom stopom uspeha DSŽC 30-10 (približno 74,3%), dok je druga po uspešnosti strategija DSŽC 20-20, sa neznatno nižom stopom uspešnosti od 73,7%. Statičke strategije SSŽC 30-10 i SSŽC 20-20 imaju niže stope uspešnosti od 67,1% i 66,6%, respektivno. Pored toga, dinamičke strategije životnog ciklusa ostvaruju povoljnije rezultate u smislu prosečnog i medijalnog rezultata u odnosu na statičke strategije. Na osnovu ovih rezultata, može se reći da postoji dovoljno dokaza koji potvrđuju Hipotezu 1, to jest, dinamičke strategije životnog ciklusa ostvaruju povoljnije performanse u odnosu na statičke strategije životnog ciklusa.

S obzirom na veliki broj prethodno isticanih argumenata u korist stava da su članovi penzijskog

fonda orijentisani ka izvesnijim ishodima i da su spremni da zauzvrat prihvate niže stope prinosa, u Tabeli 6 su date verovatnoće realizacije negativnih ishoda, to jest, manjkova u odnosu na ciljani iznos za svaku od investicionih strategija. Dinamičke strategije su i u ovom pogledu superiornije u odnosu na statičke strategije, s obzirom da verovatnoća realizacije manjka za DSŽC 20-20 i DSŽC 30-10 iznosi 26,3% i 25,7%, respektivno, dok za SSŽC 20-20 i SSŽC 30-10 verovatnoća realizacije manjka iznosi 33,4% i 32,9%, respektivno.

Pored verovatnoće realizacije negativnih ishoda, neophodno je sagledati veličinu potencijalno realizovanih manjkova. U ovom pogledu, prosečan manjak je veći kod dinamičkih strategija (14 miliona za DSŽC 20-20 i 14,2 miliona za DSŽC 30-10) u odnosu na statičke strategije (12,5 miliona za SSŽC 20-20 i 13 miliona za SSŽC 30-10).

**Tabela 5** Uspešnost statičkih i dinamičkih strategija životnog ciklusa u realizaciji ciljanog iznosa sredstava (fiksna godišnja stopa prinosa od 10%)

	Stopa uspešnosti	Prosečan višak	Maksimalan višak	Maksimalan gubitak	Medijalni višak
DSŽC 30-10	74,3%	40047972	546772373	-36847423	25083507
DSŽC 20-20	73,7%	39784410	551330151	-36133482	22535144
SSŽC 30-10	67,1%	27225561	295942691	-35691018	16025856
SSŽC 20-20	66,6%	28157148	453377902	-33336216	14497766

Izvor: Autor

**Tabela 6** Verovatnoća realizacije manjka u odnosu na ciljani rezultat

	Verovatnoća realizacije manjka	Prosečan manjak
SSŽC 20-20	33,4%	-12549251
SSŽC 30-10	32,9%	-13052301
DSŽC 20-20	26,3%	-14022451
DSŽC 30-10	25,7%	-14262626

Izvor: Autor

U cilju adekvatnije analize potencijalnih manjkova, sa kojima se osiguranik može sresti u penzijskom fondu, u Tabeli 7 su prikazani nivoi VaR i ETL mera rizika za manjak, koji se realizuje primenom različitih investicionih strategija u odnosu na ciljani rezultat, za nivo poverenja od 90%, 95% i 99%. Može da se primeti da se nivoi VaR-a i ETL-a značajno razlikuju za posmatrane investicione strategije za odabrane nivoa poverenja. Nivo VaR 90% je najveći za DSŽC 30-10 (približno 17,2 miliona novčanih jedinica), ali je najmanji za DSŽC 20-20 i iznosi približno 16,57 miliona novčanih jedinica. Nivoi vrednosti pri riziku za statičke strategije su veći od nivoa VaR za DSŽC 20-20, ali su manji od nivoa VaR za DSŽC 30-10. Nivo ETL-a je najviši za DSŽC 30-10 i iznosi 23,6 miliona, dok je najniži za SSŽC 20-20 i iznosi 22,4 miliona novčanih jedinica. SSŽC 30-10 i DSŽC 20-20 imaju sličan nivo ETL od približno 23,1 milion. Dakle, na ovom nivou poverenja, nivoi VaR i ETL ne pružaju

dovoljno dokaza da je problem javljanja ekstremno nepovoljnih ishoda izraženiji kod dinamičkih u odnosu na statičke strategije.

Za nivo poverenja od 95%, razlike u vrednostima pri riziku su manje uočljive. Strategija DSŽC 20-20 ima najveći nivo, a strategija SSŽC 20-20 ima najniži nivo vrednosti pri riziku. Razlika između najnižeg i najvišeg nivoa VaR 95% iznosi približno 800 hiljada novčanih jedinica, što ne predstavlja značajniju razliku, imajući u vidu red veličina vrednosti pokazatelja. Međutim, strategija SSŽC 20-20 ima najniži nivo ETL-a pri ovom nivou poverenja (25,6 miliona), prati je druga statička strategija SSŽC 30-10 (26,6 miliona), dok su nivoi ETL za obe dinamičke strategije veći i prevazilaze nivo od 27 miliona. Razlika između najvišeg i najnižeg nivoa ETL iznosi 2 miliona novčanih jedinica, na osnovu čega se može istaći da su, pri ovom nivou poverenja, ekstremni gubici sa kojima se može suočiti član penzijskog fonda značajno izraženiji kod dinamičkih nego kod statičkih strategija.

Pri nivou poverenja od 99%, strategija SSŽC 20-20 ima najnižu VaR vrednost (29,05 miliona), sledi je DSŽC 20-20 (29,7 miliona), dok preostale dve strategije (DSŽC 30-10 i SSŽC 30-10) imaju nivo VaR koji je veći od 30 miliona novčanih jedinica. Razlika između najvišeg i najnižeg nivoa VaR nije zanemarljiva i iznosi približno 1,6 miliona novčanih jedinica. Kada je reč o nivoima ETL, strategija sa najnižim nivoom je SSŽC 20-20 (27,8 miliona), sledi SSŽC 30-10 (31,7 miliona), dok su nivoi ETL za dinamičke strategije značajno viši (32,1 i 33,5 miliona). Pri nivou poverenja od 99%, čini se da postoje nedvosmisleni dokazi koji

**Tabela 7** VaR i ETL za nivo poverenja od 90%, 95% i 99%

	VaR (90%)	ETL (90%)	VaR (95%)	ETL (95%)	VaR (99%)	ETL (99%)
SSŽC 20-20	16790873	22438830	22091216	25618711	29058691	27801338
SSŽC 30-10	17119000	23154552	22138414	26629800	30258657	31789598
DSŽC 20-20	16570058	23140558	22916031	27087658	29746585	32141383
DSŽC 30-10	17267245	23636473	22590397	27622495	30781384	33522190

Izvor: Autor

govore u prilog stavu da su dinamičke strategije rizičnije u odnosu na statičke.

Na osnovu izračunatih nivoa VaR i ETL pokazatelja rizika, stiče se utisak da pri nižim nivoima poverenja, ne postoji značajnije izražen problem pojave ekstremno nepovoljnih ishoda dinamičkih strategija u komparaciji sa statičkim. Međutim, pri višim nivoima poverenja, kada se analiza fokusira na najekstremnije nepovoljne rezultate, sa niskom verovatnoćom realizacije, statičke strategije su manje rizične u odnosu na dinamičke strategije, za koje su najekstremniji rezultati značajno nepovoljniji. Shodno tome, Hipoteza 2 se može samo delimično potvrditi, ukoliko se rizičnost posmatra iz perspective javljanja izuzetno retkih, ali po člana penzijskog fonda ekstremno nepovoljnih finansijskih rezultata.

## ZAKLJUČAK

Na osnovu rezultata sprovedenog istraživanja, može se zaključiti da iznos sredstava realizovan primenom dinamičkih oblika strategije životnog ciklusa, uz relativno visok nivo verovatnoće premašuje iznos sredstava koji generišu statičke strategije životnog ciklusa. Na uzorku od hiljadu simuliranih finansijskih rezultata, realizovanih primenom dva para statička - dinamička strategija životnog ciklusa, utvrđeno je da postoji verovatnoća od približno 75% i 66%, respektivno, da će dinamička strategija generisati povoljniji rezultat u odnosu na statičku strategiju. U radu je pokazano i da dinamičke strategije sa višim nivoom verovatnoće ostvaruju ciljani iznos finansijskih sredstava u odnosu na statičke strategije (74,3% i 73,7%, naspram 67,1% i 66,6%), kao i da je prosečan iznos manjka u odnosu na ciljani iznos sredstava približno jednak za sve posmatrane strategije. U tom smislu, čini se da postoji dovoljno dokaza koji govore u prilog daljoj afirmaciji primene dinamičkih strategija životnog ciklusa u penzijskim fondovima. S obzirom da osiguranike od određene investicione odluke može da odvraća veličina potencijalnih gubitaka sa kojima se mogu suočiti, statičke i dinamičke strategije su poređene korišćenjem VaR i ETL pokazatelja rizika. I po

jednom i po drugom kriterijumu, dinamičke strategije životnog ciklusa ne generišu ekstremno nepovoljne ishode u odnosu na statičke strategije životnog ciklusa pri nivou poverenja od 90%. Na višim nivoima poverenja od 95% i 99%, što podrazumeva analizu najekstremnijih nepovoljnih ishoda sa niskom frekvencijom javljanja, dinamičke strategije generišu rizičnije rezultate u odnosu na statičke strategije. Dakle, dinamičke strategije životnog ciklusa nisu izraženo rizične u odnosu na statičke strategije životnog ciklusa, što predstavlja dodatni argument u pravcu njihove šire primene.

Pored napred navedenog, potrebno je istaći i činjenicu da rezultati empirijskog istraživanja ne odstupaju od rezultata sličnih istraživanja sprovedenih u svetu (Basu, Byrne & Drew, 2011; Wang, 2012; Manor, 2017) i da potvrđuju postavljene hipoteze. Za prvu hipotezu se može reći da postoji dovoljno dokaza da se može potvrditi, dok je druga hipoteza delimično potvrđena, s obzirom na to da dinamičke strategije životnog ciklusa ne generišu ekstremno nepovoljnije ishode u odnosu na statičke strategije na nivou poverenja od 90%, dok pri višim nivoima poverenja ovaj problem postaje izraženiji za dinamičke u odnosu na statičke strategije. Ukoliko se rizičnost posmatra isključivo iz perspective posmatranja veličine gubitaka, sa izuzetno niskom frekvencijom javljanja (od 5% i 1% posmatranih slučajeva), može se reći da su dinamičke strategije rizičnije u odnosu na statičke strategije.

Polazeći od navedenog, može se istaći da rezultati istraživanja imaju značajne teorijske i praktične implikacije. Imajući u vidu mali broj istraživanja u ovoj oblasti u zemljama u regionu, kao i u Republici Srbiji, ovo istraživanje doprinosi povećanju znanja u oblasti investicionog odlučivanja u penzijskim fondovima. U praktičnom smislu, povezivanjem rezultata empirijskog istraživanja sa postojećim rezultatima istraživanja u međunarodnim okvirima, mogu se izvesti određene smernice koje mogu pomoći menadžerima u penzijskim fondovima da unaprede investicioni proces.

Osnovno ograničenje istraživanja odnosi se na zanemarivanje troškovne komponente primene različitih investicionih strategija. Iako je sprovedeno

istraživanje ukazalo na prednosti primene dinamičkih investicionih strategija u odnosu na statičke investicione strategije, u analizi je zanemaren aspekt povećanih troškova primene dinamičkih u odnosu na statičke strategije. Uključivanjem troškova primene različitih strategija, kao i utvrđivanjem odnosa koristi i troškova primene različitih strategija, dobila bi se potpunija informacija koja investiciona strategija predstavlja najpovoljnije rešenje za članove penzijskog fonda. Pored toga, u istraživanju je posmatran isključivo jedan profil člana penzijskog fonda, sa unapred utvrđenim demografskim i ekonomskim karakteristikama. Buduća istraživanja bi mogla da pruže rezultate sa značajno većom upotrebom vrednošću, uz sprovedenu simulaciju različitih aspekata demografskog profila osiguranika, što bi moglo da pruži odgovor na pitanje koje su investicione strategije najpovoljnije za osiguranike u različitim životnim fazama i sa različitim stavovima u pogledu odnosa prinosa i rizika.

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## THE PERFORMANCE OF DYNAMIC AND STATIC INVESTMENT STRATEGIES IN PENSION FUNDS

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The retirement savings process for the members of a pension fund involves regular contribution payments made by a member and/or his employer, and the investment earnings generated by following an investment strategy. After the Global Financial Crisis, the aspect of value preservation has become particularly important to members of a pension fund, thus affecting the selection of an investment strategy. In face of increasing fluctuations on the financial market, static lifecycle strategies have become an unsatisfactory solution for members of a pension fund given the absence of a response to shocks on the financial market. In the paper, a comparative analysis of the performance of dynamic and static lifecycle strategies is carried out using bootstrap resampling in order to simulate investment returns and VaR indicators so as to assess the risk of an adverse financial outcome at retirement. The results of the analysis indicate the fact that dynamic lifecycle strategies generate more favorable financial results than static lifecycle strategies do, with a slightly increased likelihood of generating extremely unfavorable outcomes.

**Keywords:** dynamic investment strategies, static investment strategies, pension funds, lifecycle strategy, bootstrap resampling

JEL Classification: G11, G17, J26, J32



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## THE IMPACT OF FOREIGN AID ON HOUSEHOLD INCOME AMONG ETHNIC MINORITY GROUPS IN VIETNAM

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Ethnic minorities in Vietnam account for only 15% of the population, but their poverty levels total more than 70% of the national poverty rate. Foreign aid has been an important financial resource supporting the socioeconomic development of ethnic minorities in Vietnam. Based on the empirical research in ethnic households conducted in nine provinces throughout the country, the effect of foreign aid on household income was estimated using the OLS regression model. The results show varying effects in the magnitude and significance among different ethnic groups. Specifically, aid has significantly improved the livelihood of the Cham and Xtieng populations, whereas the results for the Hmong population are detrimental. Consequently, it is suggested that aid and the ethnic policy should be reconsidered in order to reduce inequality among ethnic groups.

**Keywords:** foreign aid, ethnic minorities, household income, rural Vietnam, OLS regression

JEL Classification: D31, D63, O12, O21

### INTRODUCTION

Vietnam is considered to be a multiethnic country consisting of 54 ethnic groups. The Kinh group of 78.32 million people accounts for 85.4% of the population. The remaining 53 ethnic groups account for only 14.6% of the country's population. In 2016, 9.8% of the population, i.e. about 9 million people, lived in poverty. About 6.6 million of the 9 million poor people are of ethnic minority heritage, even

though the latter account for only about 15% of the total population. Some ethnic minority groups have a poverty rate as high as 70% - 80%, including the Hmong, Kho Mu, and Xo Dang (Ngo, 2019).

Apart from government investments, foreign aid has been an important financial resource supporting the socioeconomic development of ethnic minorities in Vietnam. Due to the inflow of this support, Vietnam has become one of the fastest-growing economies in the world. The average GDP growth rate has constantly stood at approximately 7% for the last two decades. Vietnam has managed to achieve a per capita

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income of USD 2,300. Moreover, the nation completed its Millennium Development Goals (MDGs) before the deadline, with a high poverty reduction rate.

The positive effects of aid have been demonstrated in various studies (Hansen & Tarp, 2000; Dalgaard, Hansen & Tarp, 2004; Asiedu, Jin & Nandwa, 2008). However, foreign aid can jeopardize the health of an economy, because aid recipients may become dependent on this source of financial support (Moyo & Mafosu, 2017; Farah, Onder & Ayhan, 2018). P. Boone (1996) points out the two reasons for the inefficiency of foreign aid. First, poverty is not the result of financial shortages, and second, politicians alter their policies and the manner of their rule upon receipt of aid.

This paper has a goal to examine the effect of foreign aid on household income among ethnic minority groups in Vietnam. Using a unique dataset from a household survey, this study is the first to provide the empirical evidence of the impact of foreign aid at a household level. Using the OLS regression model, whether foreign aid affects ethnic household income or not is examined. The results obtained in this research study show that aid positively affects household income in general. However, further investigation reveals the varying impact of aid on household income in the different fields of investment and across different ethnic minority groups as well. The findings of this research study are in line with the previous work conducted in Vietnam, which was dedicated to the examination the effect of household characteristics on the income of ethnic households.

The study is organized as follows: the next section provides an overview of foreign aid and ethnic minorities in Vietnam. Section three outlines the data and the methodology. Section four provides the results and a discussion. Finally, Section five contains the conclusion and policy implications.

## FOREIGN AID AND ETHNIC MINORITIES IN VIETNAM

Since the beginning of the ODA inflow, Vietnam received about USD 80 billion over the 1993-2019

period, thus becoming one of the largest ODA recipients in the world. Of the USD 80 billion, USD 7 billion consists of nonrefundable aid, over USD 70 billion comprises loans with the interest rates below 2%, as well as USD 1.62 billion in less preferential loans, but with the interest rates still lower than those of commercial loans. Some of the main donors are the World Bank (WB), the Asian Development Bank (ADB) and Japan, contributing about 29%, 20% and 34% of said aid, respectively. As of 2017, the Government's external debt was over USD 45.8 billion, and the foreign debt ratio was about 20.52% (Ministry of Planning and Investment, 2019).

Ethnic minorities in rural mountainous areas have been the subject of the major interest to aid donors. After five years of implementing the "Strengthening International Cooperation to Support Socioeconomic Development in Ethnic Minority Areas" Project under the Prime Ministerial Decision No. 2214 / QD-TTg as of 14<sup>th</sup> November 2013, nearly 2,000 programs and projects have been implemented through a number of ministries, government agencies and in a number of localities. Of these, nearly 200 poverty reduction and social security projects have been implemented in ethnic areas, ranging from the Northwestern Region to the Central Highlands. Further 252 projects dealt with education, vocational training and job creation for ethnic minorities. A total of 10 aid projects supported five Central Highlands provinces and included four grant projects sponsored by the Global Fund, the European Community (EC), and Global Alliance on Vaccines and Immunization (GAVI), in addition to the six aid projects financed by loans from the WB, ADB, Japan International Cooperation Agency (JICA), with a total investment and support budget for the whole region of about USD 88 million. Nine aid projects were distributed among the 16 provinces in the Northwestern Region, of which four nonrefundable projects were provided by the Global Fund and GAVI. Five projects were financed by the WB, ADB and JICA (Committee of Ethnic Affairs, 2018).

In the provinces included in the survey, the ODA is a very important financial resource. As H. M. Tran and L. T. Nguyen (2020) point out, the total ODA

invested in Vinh Phuc province by the year 2018 was approximately USD 177 million, of which the ODA capital received by the province was USD 123.7 million. In the Bac Kan province, a total of 80 programs and projects using the ODA and concessional loans from foreign donors were implemented from 1993 to 2018. Binh Phuoc is also a province which has received and managed many ODA-funded projects, including Japan International Bank (JBIC) projects, 10 in the field of the infrastructure, transportation and rural electricity, with a total investment of about USD 4.6 million. A project funded by the World Bank and the ADB for clean water supply, wastewater treatment, education, healthcare, the rural infrastructure and community development was also included, and the investment totaled about USD 51.3 million. The above-mentioned ODA funds have greatly contributed to the socioeconomic development and livelihoods of the households in the province.

Despite the essential role of aid, its implementation in ethnic minority areas showed some weaknesses from the beginning. Firstly, the capacity to absorb ODA capital is low and does not meet the requirements. Compared to the ODA capital signed for in the past 20 years for the whole country (including ethnic minority areas), the disbursement rate came to only about 67% (Ministry of Finance, 2019).

Secondly, when the nature of the locality and the ethnic group involved are taken into consideration, the foreign aid program and project design is sometimes impractical. A number of the projects implementing new models, such as microfinance, clean water management and business, and forest protection only remain active while funding is in place. Furthermore, the implementation of different models within a single area, for example in poverty reduction, led to overlapping, inefficiency and a waste of local and donor resources as well. Thirdly, the management of some aid projects was unprofessional due to the limited capability of project managers, especially at the local level. Project management personnel are often inconsistent, and in many cases work on a part-time basis. In a similar fashion, project management training was not regularly or professionally conducted. Last, but not least, a

lack of participation and collaboration by the local community in the planning and implementation processes often led to the ineffectiveness of the project and failure to uphold the model after installation.

## DATA AND METHODS

### Data

In the research study, the data from the 2019 Household Survey (HS) conducted by the researchers of the Institute of Anthropology, Vietnam, were used. The 2019 HS covers the ethnic households sampled from six socioeconomic regions. In each region, a province was selected as representative of the amount of aid and the number of ethnic minority households. For the three regions, i.e. the Northern Midlands and Mountains, the Central Highlands, and the Southwestern regions, two provinces were selected as representative for a wide distribution of ethnic minorities in them. Thus, nine provinces were selected for the study. In each province, a district was selected, and each district chose two communes based on the criteria of income and the number of ethnic minority households. Households in each commune were randomly chosen for the survey. A summary of the sample included in the survey is presented in Table 1.

The household data include detailed information about demography, assets, health benefits and expenditures, education, employment and income, and foreign aid. The data were merged from the nine provinces into one cross-sectional dataset providing a subsample of 2,514 rural households. The combined data allowed to the examination of the factors influencing the effectiveness of foreign aid on a larger scale.

### Methods

Following T. Q. Tran (2015), the Cobb-Douglass production function was used in the form of a semi-log function commonly used to analyze the factors

affecting household welfare. Our study assumed the log of per capital household income as the function of foreign aid, and the household characteristics. A general form of this specification can be expressed as follows:

$$\ln Y_i = \beta_0 + \beta_1 X_i + \beta_2 P_i + e_i \quad (1)$$

where  $\ln Y_i$  is the natural logarithm of the per capita income of the household  $i$ .  $X_i$  is the vector of the household characteristics (e.g. education, the gender, the marital status, the main job and the years of age of the household heads, the household size, the dependency ratio and household landholding).  $P_i$  is the vector of the foreign aid status as the proxy for the impact of foreign aid.  $e_i$  indicates the unobserved variables that follow the normal distribution with a zero mean. The standard assumptions were applied for the estimation by using Ordinary Least Squares (OLS) regression.

**Table 1** The sample summary based on the region

Region/ provinces	Total sample	Recipient household	Nonrecipient household
Northern Midlands and Mountains			
Lao Cai	282	152	130
Bac Kan	285	145	140
Northeast			
Vinh Phuc	274	156	118
South Central Coast			
Ninh Thuan	276	129	147
Central Highlands			
Dak Lak	279	138	141
Kon Tum	282	136	146
Southeast			
Binh Phuoc	278	151	127
Southwest			
Tra Vinh	279	128	151
Soc Trang	279	132	147
	2,514	1,267	1,247

Source: Authors

## RESULTS AND DISCUSSION

### Descriptive statistics

According to the descriptive statistics reported in Table 2, the average years of the education of the household head are 5.33, varying between 0 and 16. Most household heads are men (75%), the majority of them are married (86%), and their average age is approximately 46.68 years, ranging between 19 and 94 years of age. Each household has an average of 4.29 members, but the household size may reach as many as 10 members, given the fact that the households often include relatives from the extended family. The average dependency ratio is 36.56%, ranging between 0% and 100%. The data show that the household heads are mostly farmers (81%). The average residential land and gardens owned by a household are 530.89 m<sup>2</sup>, while the average agricultural land and forestland and the other land owned by a household total 3,595.94 m<sup>2</sup>, 3,384.94 m<sup>2</sup>, and 168.03 m<sup>2</sup>, respectively. The results obtained are in agreement with the previous studies on ethnic households in Vietnam (Baulch, Hung & Reilly, 2012; Tran & Vu, 2019).

In Table 3, various demographic, educational and landholding characteristics across the families that receive foreign aid and across those that do not are compared. The results are almost the same across the two types of households and in comparison with the whole sample. There is a slight difference in terms of landholding, while the recipient families often acquire more agricultural and the other land, but less residential, garden and forest land.

### Econometric analysis

Table 4 reports the results for the effect of foreign aid on household income by using an OLS estimator. The regression model used in this paper controls for the household characteristics such as the age, gender, education and main job of the household heads. In addition to the foreign aid variable, aid was divided into the subcategories of health and medical services, education and training, and the use and management of natural resources.

**Table 2** The descriptive statistics of the household characteristics

Variables	Mean	Std Dev.	Min.	Max.
The education of the household heads (the years of schooling)	5.33	4.13	0	16
The Gender of the household head (1=male; 0=female)	0.75	0.43	0	1
The age of the household head (years)	46.64	14.15	19	94
The marital status of the household head (1=married; 0=single)	0.86	0.34	0	1
The household size (the total number of the family members)	4.29	1.50	1	10
The dependency ratio (%)	36.56	24.03	0	100
The main job of the household head (1=farmer; 0=other)	0.81	0.40	0	1
Residential land and gardens (m <sup>2</sup> )	530.56	1,450.75	0	40,000
Agricultural land (m <sup>2</sup> )	3,587.70	6,251.81	0	90,000
Forestland (m <sup>2</sup> )	3,416.15	12,877.70	0	99,999
Other land (m <sup>2</sup> )	167.01	1,266.34	0	30,000

Source: Authors, based on: HS, 2019

As has been mentioned earlier, one of the main purposes of this study is to examine the relationship between foreign aid and household income. Table 4 shows the OLS estimates for the effect of foreign aid on household income. The foreign aid coefficient variable is positive and statistically significant, with

a 95% confidence interval. This result indicates the fact that a household benefiting from any aid acquires 1.14 times greater income than the one that has never received any aid at all. Thus, access to foreign aid projects partly explains the income difference between the beneficiary group and the control group.

**Table 3** The descriptive statistics of the household characteristics by groups

Variables	Recipient of Foreign Aid		Nonrecipient of Foreign Aid	
	Mean	SD	Mean	SD
The education of the household heads (the years of schooling)	5.27	4.13	5.39	4.13
The gender of the household head (1=male; 0=female)	0.73	0.38	0.77	0.42
The age of the household head (years)	46.09	13.17	47.27	15.11
The marital status of the household head	0.87	0.38	0.86	0.35
The dependency ratio	35.26	22.97	37.88	24.99
The household size (the total number of the family members)	4.30	1.49	4.29	1.51
The main job of the household head (1=farmer; 0=other)	0.82	0.38	0.79	0.41
The residential land and gardens acquired (m <sup>2</sup> )	486.23	875.50	576.17	1,865.82
The agricultural land acquired (m <sup>2</sup> )	3,873.55	6,143.52	3,314.52	6,387.89
The forestland acquired (m <sup>2</sup> )	3,144.07	11,578.94	3,629.11	13,951.41
The other land acquired (m <sup>2</sup> )	234.80	1,359.90	100.35	1,169.77

Source: Authors, based on: HS, 2019

**Table 4** The OLS estimates of the effect of foreign aid on household income by the subcategories of aid

Independent variables	Dependent variable: Log MPCHI
Foreign aid	0.109** (0.047)
The age of the household head	0.016*** (0.002)
The education of the household head	0.033*** (0.005)
The gender of the household head	0.158*** (0.050)
The main job of the household head	-0.264*** (0.053)
Subcategories of foreign aid	
Health and medical services	-0.107** (0.054)
Cultural preservation	0.072 (0.272)
Education and training	-0.289** (0.120)
Nonfinancial educational support	-0.624*** (0.082)
Employment and job search	0.101* (0.058)
Natural resource use and management	-0.331*** (0.063)
Constant	4.335*** (0.110)
R-squared	0.1941
Observations	1,754

Standard errors (SE) are given in parentheses.

\*\*\*, \*\*, \* Statistically significant at the 0.01, 0.05 and 0.1 levels, respectively.

Source: Authors, based on: HS, 2019

The study finds a negative relationship between the log of household income and foreign aid for several subcategories, including health and medical services, education and training, and nonfinancial educational support. The results suggest that these aid subcategories do not have a direct impact on household income. The reason for this is that support

for these subcategories is still small, and the projects included in the survey mainly focus on the solutions related to livelihoods and economic development. The statistical results show that only 4% of the households believe that the expenditure for education and household training comes from foreign aid, whereas most of the costs are borne by the family (39%). On the other hand, said aid does go to the deserving poor.

Unsurprisingly, the study confirms the fact that the occupation of the household heads plays a major role in household income. The result shows that the occupation of a farmer significantly reduces household income by around 23%. This result is confirmed by the previous studies (Tran, 2015) that found that participation in nonfarm activities, such as wage-earning employment, alleviates the poverty of an ethnic household. The gender of the household heads also greatly contributes to household income. Per capita income is about 17% higher for the household whose head is male than for the female-led household. This result is corroborated by the previous studies (Buvinic & Gupta, 1997; Biyase & Zwane, 2018) that found a similar link between poverty and female-led households across developing countries. The education of the household heads also has a positive influence on household income, and an additional year of formal schooling increases per capita income by 3%, *ceteris paribus*. Finally, the age of the household heads positively affects household income. Per capita income is 1.6% higher for each additional year of age, *ceteris paribus*.

The impact of foreign aid is further decomposed by using the OLS estimators separately for each ethnic minority group. Table 5 shows the OLS estimates of the effect of foreign aid on household income by ethnic groups. The direction and significance of the foreign aid coefficient variable vary across different ethnic minority groups. While aid shows a positive effect among the San Diu, Khmer and Cham groups, it has a negative effect among the Nung, Hmong and Ede groups. However, the effect of aid is only significant for the Hmong and Cham groups.

Different subcategories of aid also show a varying impact and significance across the ethnic groups. Specifically, foreign aid for health and medical

**Table 5** The OLS estimates of the effect of foreign aid on household income by ethnic groups

	Log MPCHI							
	Nung	Hmong	San Diu	Khmer	Cham	Ede	Mnong	Xtieng
Foreign aid	-0.091 (0.127)	-0.230*** (0.070)	0.003 (0.156)	0.023 (0.107)	0.764*** (0.124)	-0.151 (0.119)	-0.105 (0.131)	0.338*** (0.101)
The age of the household head	0.018 (0.005)***	-0.001 (0.003)	-0.009 (0.005)	-0.003 (0.003)	-0.001 (0.004)	0.004 (0.004)	0.001 (0.005)	-0.003 (0.004)
The education of the household head	0.053*** (0.018)	0.008 (0.009)	0.036* (0.019)	0.031*** (0.011)	0.018 (0.012)	-0.001 (0.010)	0.018 (0.014)	0.021 (0.016)
The gender of the household head	0.448*** (0.168)	0.116 (0.080)	0.258 (0.158)	-0.012 (0.096)	0.222** (0.110)	0.131 (0.096)	-0.116 (0.120)	0.099 (0.138)
The main job of the household head	-0.890*** (0.184)	-0.289** (0.145)	-0.155 (0.150)	0.155* (0.083)	-0.04 (0.114)	-0.043 (0.206)	-0.738 (0.743)	0.347*** (0.105)
Subcategories of foreign aid								
Health and medical services	-0.605** (0.333)	0.502 (0.318)	-0.426 (0.375)		0.210* (0.126)	0.029 (0.449)	0.365*** (0.141)	0.315 (0.309)
Cultural preservation	-0.808 (0.817)		0.478* (0.268)	-0.228 (0.401)				
Education and training	0.375 (0.585)		-1.016 (1.086)		-0.289** (0.120)	0.672 (0.537)	-0.186 (0.155)	-2.427*** (0.793)
Nonfinancial educational support	-0.244* (0.146)	0.180 (0.275)	-0.238 (0.285)	-0.214 (0.282)	-0.624*** (0.082)	-0.256 (0.221)	0.308** (0.133)	-0.171 (0.404)
Employment and job search	-0.110 (0.134)	-1.284** (0.608)	0.359** (0.166)	-0.084 (0.114)	0.101* (0.058)	0.019 (0.130)	0.123 (0.143)	0.259 (0.798)
The use and management of natural resources	0.168 (0.127)	0.291** (0.129)	0.147 (0.580)	-0.115 (0.109)	-0.331*** (0.063)	0.292** (0.131)	-0.061 (0.108)	
Constant	3.989*** (0.436)	5.706*** (0.234)	5.035*** (0.332)	5.414*** (0.212)	4.335*** (0.110)	4.319*** (0.277)	4.225*** (0.764)	4.287*** (0.362)
R-squared	0.2573	0.1161	0.1008	0.0453	0.2514	0.0410	0.1348	0.1269
Observations	269	282	265	415	245	269	256	255

Standard errors (SE) are given in parentheses.

\*\*\*, \*\*, \* Statistically significant at the 0.01, 0.05 and 0.1 levels, respectively.

Source: Authors

services positively contributes to household income among the Hmong, Cham, Ede, Mnong and Xtieng groups, whereas it has a negative effect on household income among the Nung and San Diu groups. The effect of foreign aid on health and medical services only shows highly statistical significance among the Nung and Mnong groups.

Foreign aid for education and training is often found to negatively contribute to the household income of the ethnic minority groups. Specifically, the recipients

of aid for education and training among the Cham and Xtieng groups have, respectively, 0.75 and 0.09 times lesser household income than the nonrecipients. The results are highly significant, with a 99% confidence interval.

In a similar fashion, foreign nonfinancial aid for education is often found to negatively contribute to the household income of the ethnic groups. Specifically, nonfinancial aid for education has a negative effect on the household income of the Nung, San Diu, Khmer,

Cham, Ede and Xtieng groups, and a positive effect only for the Hmong and Mnong groups. With a 95% confidence interval, the household income level of the recipients of nonfinancial aid for education is 0.54 times lower than for nonrecipients among the Cham group, while it is 1.36 times higher among the Mnong group.

Foreign aid for employment and job searching positively contributes to the household income of the San Diu, Cham, Ede, Mnong and Xtieng groups, whereas it negatively contributes to the household income of the Nung, Hmong and Khmer groups. Statistical significance at a 95% confidence level is found only for the Hmong and San Diu groups. While the household income of the Hmong recipients of employment and job search aid is 0.28 times lower than that of the nonrecipients, the household income of the San Diu recipients of employment and job search aid is 1.43 times higher than that of the nonrecipients.

Foreign aid for the exploitation and management of natural resources increases the household income of the Nung, Hmong, San Diu and Ede groups, while it reduces the household income of the Cham and Mnong groups. Specifically, with a 95% confidence level, the Hmong and Ede recipients of aid enjoy 1.34 times greater household income than the nonrecipients do. On the other hand, with a 95% confidence level, the Cham recipients of aid earn 0.72 times lesser household income than the nonrecipients do.

Finally, the intercept coefficients show inequality in the level of household income across different ethnic groups. The Hmong and San Diu ethnic groups are among the better-off groups, with a higher level of household income, whereas the Nung ethnic group find themselves among the disadvantaged groups, with the lowest level of household income.

## CONCLUSION

Vietnam is a particularly interesting case for estimating the impact of foreign aid as it is a multiethnic country. Foreign aid is considered to be

the major financial source for social development, especially in developing countries. Although there have been various studies investigating whether aid and other remittances hinder or are beneficial for growth, only a few examine the impact at the household level. Thus, our study fills the gap by investigating the consequences of foreign aid for household income.

This study provides the empirical evidence of the impact of foreign aid on ethnic household income. Using a unique dataset from a household survey, this study is the first to provide the empirical evidence of the impact of foreign aid at the household level. The results indicate the fact that foreign aid has a positive effect on household income, even after controlling for the other factors in the model. In other words, the probability that a household will achieve higher income is greater for those who are recipients of foreign aid than for those who are not. This suggests the continuation of capital inflows to eradicate poverty among ethnic households in the rural and mountainous regions of Vietnam.

In order to answer the question: What may be the potential cause of the negative effect of foreign aid on household income? the impact of different types of aid projects is further examined. The results show the areas where aid has a negative effect on household income, including:

- health and medical services,
- education and training (both financial and nonfinancial support), and
- aid projects relating to the use and management of natural resources.

The findings, however, do not indicate the ineffectiveness of aid in these areas; they rather show the indirect consequences and the absence of the benefit of these types of aid for household income. More studies should be carried out to further investigate the reasons for the negative effect of foreign aid on ethnic household income in such fields.

This study has identified a number of the other factors substantially contributing to household income.

Specifically, the occupation of household heads is found to play the major role in explaining income differentials. The household heads who are farmers earn significantly less than those in other occupations. Unfortunately, access to off-farm jobs is quite limited for ethnic households in rural mountainous areas (Nguyen, Tran & Vu, 2017). The other household characteristics, such as education and the gender and age of household heads, also play an important role in increasing household income. The results imply that the policies improving the access of rural households to better education, together with the efforts to diversify the structure of labor towards higher skilled jobs, should improve the livelihood of households in these rural areas.

This study provides the first evidence that foreign aid has varying effects on household income across ethnic minority groups. Using OLS regression for separate ethnic groups, aid is found to increase the household income of the Cham and Xtieng groups at a highly significant level. These are the groups that have received support from foreign aid projects, effective in improving their living conditions and increasing their income. The empirical evidence shows that a high proportion of the respondents from these ethnic groups reported that the foreign aid projects implemented among them were suited to the needs of the beneficiaries. In particular, a total of 92.4% of the Cham households participating in the survey and being the recipients of foreign aid indicated the fact that they had experienced a significant improvement in their living conditions and an increase in income.

The Xtieng ethnic group also noted that 90.8% of the households receiving aid had experienced an improvement in their living conditions and other benefits, such as better jobs, higher income and better access to education. These two ethnic groups have seen the greatest improvement in their living conditions. On the other hand, aid was found to have a negative impact on the household income of the Hmong ethnic group. The reason for this negative effect may be the inadequacy of the foreign aid projects implemented in the project area, resulting in the ineffectiveness of aid. Many Hmong households believed that foreign aid projects were unsuitable for

local conditions (36%) or that, although the projects were suitable, new technology was not, or the breed of livestock was not well-adapted to development in the project area (64%).

The subcategories of foreign aid also show varying effects on household income across different ethnic groups. The findings thus suggest that the approach to aid where the models show negative or insignificant results should be reconsidered. At the same time, the good implementation where aid has greatly improved people's livelihoods, as in the case of the Cham people, should be acknowledged.

Vietnam is still a developing country with a large measure of poverty and limited financial resources. Therefore, foreign aid is a critical financial resource supporting the socioeconomic development of ethnic minorities in rural and mountainous areas. However, critical conditions would have to be met in order to ensure the effectiveness of aid and reduce inequality across different ethnic groups. Firstly, donors need to closely adhere to their pro-poor growth policy by targeting the neediest and the most deserving. Simultaneously, the authorities have to ensure that aid actually reaches the poor. As suggested by D. King (2004), raising people's awareness and increasing the role of the local community through a collaborative model would also contribute to the success of projects. Finally, B. Baulch, T. T. K. Chuyen, D. Haughton and K. Haughton, (2007) suggest that the diversity in socioeconomic development experiences among different ethnic minorities indicates the need for a similar diversity in the policy interventions specifically designed for each particular group.

This study has its limitations. Due to the fact that the survey evaluating foreign aid was only conducted in 2019 and that, therefore, longitudinal or panel data were lacking, it was not possible to examine the effect of foreign aid over time. Using panel data to formulate the household income equation would reduce the bias, as this method accounts for time-invariant unobservable household characteristics. This suggests that further research is needed to address this issue, assuming the availability of said panel data.

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## UTICAJ STRANE POMOĆI NA PRIHODE DOMAĆINSTAVA ETNIČKIH MANJINA U VIJETNAMU

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Etničke manjine u Vijetnamu čine svega 15% stanovništva te zemlje, ali nivo siromaštva tih manjina iznosi više od 70% nacionalne stope siromaštva. Strana pomoć već neko vreme predstavlja važan finansijski resurs koji potpomaže društveno-ekonomski razvoj etničkih manjina u Vijetnamu. Na osnovu empirijskog istraživanja domaćinstava etničkih manjina, sprovedenog u ukupno devet provincija na teritoriji čitave zemlje, procenjuje se učinak strane pomoći na prihode domaćinstava, korišćenjem regresionog modela običnih najmanjih kvadrata (ONK). Rezultati pokazuju različite efekte u pogledu veličine i značaja te pomoći unutar različitih etničkih grupa. Strana pomoć je konkretno značajno poboljšala egzistenciju stanovnika Cham-a i Xtieng-a, dok rezultati za stanovnike Hmong-a to negiraju. Kao posledica toga, predlaže se ponovno razmatranje pomoći i etničke politike u cilju smanjenja nejednakosti među etničkim grupama.

**Ključne reči:** strana pomoć, etničke manjine, prihodi domaćinstva, ruralni Vijetnam, regresija ONK

JEL Classification: D31, D63, O12, O21

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# MEASURING THE RISK OF LENDING TO SMALL AND MEDIUM-SIZED ENTERPRISES IN THE REPUBLIC OF SERBIA IN LIGHT OF MODERN BANKING REGULATIONS

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The subject matter of this paper is measuring the risk of lending to Small and Medium-sized Enterprises (SMEs) from the point of view of the existing banking regulations. The paper starts from the hypothesis that an increase in the transparency of the credit risk measurement process would enable the timely detection of problems and leave room for the actions necessary for the management of small and medium-sized enterprises, as well as all creditors, and generate an opportunity for SMEs to provide more favorable sources of financing. In the research study, the well-known Altman Z-Score model was used to assess the probability of default and rank a company. The results of the application of the Z-Score model indicate that, to a certain extent, they can detect the companies in which bankruptcy may occur in the two years following the assessment, on the one hand, but they cannot be considered as reliable for the assessment of the probability of the bankruptcy of SMEs in the Republic of Serbia, on the other.

**Keywords:** SME financing, credit risk, capital requirements, credit scoring, bond rating equivalent

JEL Classification: G21, G28

## INTRODUCTION

Small and Medium-sized Enterprises (SMEs) represent the most efficient segment of the economy in almost all countries of the world. These companies

usually face limited access to the favorable sources of financing in both the money market and the capital market, especially in terms of the conditions and price of their use. It is precisely the difficult financing that is the biggest obstacle to the growth and development of SMEs. As SMEs usually have no access to organized capital markets, bank financing often remains the only alternative. Banks' biggest problems when granting loans to SMEs are related to

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a lack of adequate loan collateral and the unfavorable credit rating of companies, which increases credit risk and requires that these loans, with long and expensive claim processing procedures, should be offered at high interest rates.

The subject matter of this paper is to measure the risk of lending to SMEs from the aspect of the existing banking regulations.

The main goal of the research is to examine, on the example of the SMEs operating on the territory of the Republic of Serbia (RS), the extent to which the well-known Altman Z-Score model can be considered reliable for the purpose of assessing the probability of default. The paper uses the methodological approach of linking Z-score results with the equivalent of bond ratings, which allows us to determine the probabilities of default in a transparent way.

Our research is based on the following hypothesis:

H: Increasing the transparency of the credit risk measurement process would allow for the timely detection of problems and leave room for the actions necessary for the management of SMEs, as well as all creditors, and generate an opportunity for SMEs to provide more favorable sources of financing.

The paper is divided into four parts. The first part of the paper emphasizes the role of banks in financing small and medium-sized enterprises. The second part of the paper is focused on calculating capital requirements when using an advanced approach based on internal rating. In the third part of the paper, the way how credit scoring models can be used to assess the probability of default is presented. In the fourth part of the paper, the example of the companies registered for the production of cocoa, chocolate and confectionery products is examined, and whether Z-score models can be considered as reliable for assessing the probability of the bankruptcy of the small and medium-sized enterprises operating in RS in the observed period is investigated. Also, the extent to which the allocation of SMEs in the category of exposure to individuals affects capital adequacy requirements is shown.

## THE ROLE OF BANKS IN FINANCING SMALL AND MEDIUM-SIZED ENTERPRISES

Financing is a significant factor determining the survival and growth of SMEs. SMEs usually face limited access to favorable sources of financing in both the money market and the capital market, especially in terms of the conditions of and the price for their use (Erić, Beraha, Đurićin, Kecman i Jakišić, 2012, 64). The availability of different sources of financing changes during the lifecycle of a company, depending on the stage of its growth, goals and growth potential, the sector in which the company operates and the relationship of management to risk. The range of possible sources of financing largely depends on the degree of economic development, especially the development of the financial system and financial markets (Erić, 2003). Developed systems are those that have developed the mechanisms of the so-called indirect financing (Mishkin & Eakins, 2006), where there are several financial institutions and intermediaries.

Difficult financing is the biggest obstacle to the growth and development of SMEs. Therefore, a particular problem for entrepreneurs and SME owners is to provide sources for financing their investments, especially so for innovation, research and development.

Bank loans are the most important source of external financing during the lifetime of the largest number of SMEs. There are various bank loans that can be short- and long-term from the aspect of their maturity, with either a fixed or a variable interest rate. Loans can also be divided according to the purpose, the method of security, the method of repayment, and so on. For the SME sector, when very small businesses are started or run, a microcredit is the most suitable.

Each bank defines the loan offer and the manner of their approval is in accordance with its internal regulations and procedures. In order for SMEs to receive a loan, they must submit a loan application, from which the bank should consider the credit potential of the company and determine the

company's ability to repay the borrowed funds within the prescribed period. In order to protect the bank from credit risk, it often asks for various additional security mechanisms, such as mortgages, guarantors, and so forth. This is a big problem for SME owners in the initial stages of the lifecycle of a company, because these are young and small businesses without a credit history of a sufficient quality or the adequate payment security instruments that qualify them for loan approval.

Lending conditions for SMEs vary from country to country, but they are always less favorable than those under which large companies borrow. The reasons for this lie in the fact that the credit needs of these two groups of companies are very different, i.e. the fact that smaller loan amounts granted to SMEs necessarily require higher interest rates in order for banks to provide the desired profitability.

The biggest problems banks are faced with when granting loans to SMEs are related to:

- the problem of securing a loan, i.e. an insufficient financial capacity (inadequate cashflow, insufficiently capitalized companies, i.e. a low share of own funds, the high competition that affects a decline in profit margins, high refinancing risk),
- a lack of adequate collateral,
- owner and management risk (i.e. a lack of an adequate corporate governance system),
- a lack of quality business plans,
- a lack of a credit history, and
- the unfavorable credit rating of the company.

The biggest problems SMEs are faced with when using bank loans as a source of financing are:

- high interest rates,
- limited loan amounts, which often do not meet the needs of the project being financed,
- inflexibility,
- long, complicated and expensive loan processing and approval procedures, and
- problematic collateral.

A survey conducted by the auditing and consulting company EY (2019) indicates the problems related to financing the operations of SMEs. Namely, as many as 77 percent of the respondents pointed out the fact that they financed the business and development of their companies from their own funds. Although, in addition to their own funds, which are absolutely at the forefront of financing fast-growing entrepreneurial companies, banks represent the leading source of credits for SMEs, their services are not used to the extent that could be expected given their market dominance. Banks are still not exposed to the risk of lending to small businesses. Many do not either recognize the fact that small portfolios can be of a high quality and are concerned about transaction costs, as these two factors greatly affect return on investment in a situation where there are strong pressures to make a profit and preserve capital.

Undoubtedly, bank loans are a very expensive and limited source of financing for the SME sector in the Republic of Serbia. Restrictions on the granting of bank loans are related to macroeconomic and financial developments in the country, where long-term sources of funds for banks themselves are quite limited, which is why there is particularly a lack of long-term loans. The restrictive credit and monetary policy that has continuously been implemented in RS in the last ten years with a high level of required reserves reduces the credit potential of banks and limits their lending to the SME sector. In addition, one of the reasons for the reduced interest in financing SMEs is the choice of the quality government securities that offer relatively high, but unlike placement in the SME sector, secure earnings.

Given the high degree of uncertainty regarding the business results of SMEs, banks face credit risk, i.e. the probability that the borrower will not be able to repay the borrowed funds within the defined repayment schedule. Since the capital requirements in terms of credit risk have an impact on the price at which banks are willing to lend to SMEs, the methodological aspect of capital calculation in accordance with the Basel standards will be presented in the next part of the paper.

## CAPITAL REQUIREMENTS FOR CREDIT RISK EXPOSURE TO SMALL AND MEDIUM-SIZED ENTERPRISES

According to the existing banking regulations, a bank may use the standardized approach and the Internal Rating-Based approach (IRB) in order to calculate a capital requirement for the credit risk related to its exposure to SMEs. In addition, the calculation of the capital requirement differs depending on whether the bank classifies the exposure to small and medium-sized enterprises in the category of exposure to companies or exposure to natural persons.

In the standardized approach, banks must classify their exposures according to different risk categories and determine the weights based on the credit rating that the small and medium enterprise received from the external credit assessment institution that received the consent of the National Bank of Serbia. The selection of a rating agency and the use of credit ratings to assign credit risk weights are regulated by the Decision on the Capital Adequacy of the Bank (Official Gazette of the RoS, no. 46/2011, 6/2013 and 51/2014). At the time of writing, Moody's Investor Service Ltd. was on the list of eligible rating agencies (NBS, 2020).

In the approach based on internal rating, banks use internal rating systems when calculating capital requirements for credit risk. There are two variants of the internal ratings approach:

- the basic approach based on internal rating (IRB - FIRB), within the framework of which banks use their own estimates of the probability of default (PD), whereas the values of other parameters, i.e. risk components (LGD - loss due to default, EAD - current exposure arrears, and M - effective maturity), are determined by the supervisor.
- the advanced IRB approach based on which banks use their own estimates for all risk components, as well as conversion factors, while meeting the minimum standards and, if applicable, their own estimates of effective maturity.

In the next part of the paper, the focus is on the

formulas used to calculate capital requirements when using the AIRB approach. Under this approach, a regulatory capital charge is designed to cover a bank's unexpected credit loss, which is denoted as the difference between Value-at-Risk (VaR) at a confidence level of 99.9% as a measure of a potential portfolio loss over time and the expected loss (Hurlin, Leymarie & Patin, 2018).

For all SMEs, risk-weighted assets are determined as follows:

$$\text{Risk value assets} = K \cdot 12.5 \cdot \text{EAD} \quad (1)$$

where:

$K$  is the capital requirement for credit risk, and  $\text{EAD}$  is exposure at default.

In the event that an SME, which is not in the default status, is classified into the category of exposure to natural persons (SME Other Retail), the capital requirement for credit risk ( $K$ ) depends on the assessment of the probability of the occurrence of the default status (the probability of default ( $PD$ ), a loss given default ( $LGD$ ), and exposure at default ( $EAD$ ); and in case SME is classified into the category of exposure to companies (SME Corporate), it also depends on the effective maturity ( $M$ ) for the given exposure.

In accordance with Basel II, if an SME is classified into the category of exposure to natural persons, a capital requirement for credit risk ( $K$ ) is determined based on the following formula:

$$K = \left\langle LGD \cdot N \left[ \frac{G(PD) + \sqrt{R} \cdot G(0.999)}{\sqrt{1-R}} \right] - PD \cdot LGD \right\rangle \cdot 1.06 \quad (2)$$

where:

$N(x)$  stands for the function of the cumulative probability distribution for the standard normal random variable,

$G(Z)$  is the inverse function of the cumulative probability distribution for the standard normal random variable,

$LGD = 1 - RR$  denotes the loss given default,

$RR$  is the recovery rate, and

$R$  is the correlation for exposures to individuals:

$$R = 0.03 \cdot \frac{1 - e^{-35 \cdot PD}}{1 - e^{-35}} + 0.16 \cdot \left( 1 - \frac{1 - e^{-35 \cdot PD}}{1 - e^{-35}} \right) \quad (3)$$

If an SME is classified into the category of exposure to companies, a capital requirement for credit risk ( $K$ ) is determined as follows:

$$K = \left\langle LGD \cdot N \left[ \frac{G(PD) + \sqrt{R} \cdot G(0.999)}{\sqrt{1-R}} \right] - PD \cdot LGD \right\rangle \left\langle \frac{1 + (M - 2.5) \cdot b}{1 - 1.5 \cdot b} \right\rangle \cdot 1.06 \quad (4)$$

$$b = [0.11852 - 0.05478 \cdot \ln(PD)]^2,$$

where:

$R$  is the correlation for exposures to companies:

$$R = 0.12 \cdot \frac{1 - e^{-50 \cdot PD}}{1 - e^{-50}} + 0.24 \cdot \left( 1 - \frac{1 - e^{-50 \cdot PD}}{1 - e^{-50}} \right) - 0.04 \cdot \left( 1 - \frac{(S - 5)}{45} \right) \quad (5)$$

For exposures to small and medium-sized enterprises, i.e. the companies belonging to the group whose total annual income ( $S$ ) at the consolidated level is less than or equal to EUR 50 million in the dinar equivalent, the expression  $0.04 \cdot [1 - (S - 5) / 45]$ , is added when calculating the correlation, where 5 million euros  $\leq S \leq 50$  million euros.

For exposures in default, capital requirements ( $K$ ) are determined as follows (Basel Committee on Banking Supervision, 2006):

$$K = \text{Max} \{ 0; (LGD - EL_{BE}) \} \quad (6)$$

where  $EL_{BE}$  is the bank's best estimate of the expected loss for exposure in the default status.

Assessing the probability of default as a multiyear average of one-year default rates for each rating

category of debtors is the first step in quantifying and assessing credit risk in the RBI approach and is the key aspect of banking regulation (Cardone-Riportella, Trujilo-Ponce & Briozzo, 2011).

In the next part of the paper, the way how Z-score models can be used to estimate the probability of default is shown.

## THE APPLICATION OF THE CREDIT SCORING MODEL FOR ESTIMATING THE PROBABILITY OF THE DEFAULT STATUS

The development of relevant models for quantifying the probability of the default status is the subject matter of numerous modern studies, many of them using logistic regression or logit regression, as well as discriminant analysis, which allows us to make a distinction between high- and low-risk borrowers. The following section provides an overview of some of these studies.

### Literature Review

E. Altman and G. Sabato (2005) investigate the effects of applying the RBI approach on banks' capital requirements for exposures to small and medium-sized enterprises in the United States, Italy, and Australia. Using logistic regression on data obtained from over 2,000 U.S. companies (with the sales of less than \$ 65 million) in the period from 1994 to 2002, they developed a one-year bankruptcy prediction model. Taking into account the rules of the international agreement on bank capital (Basel Capital Accord) for small and medium-sized enterprises, they examined the ability of the model to lower capital requirements.

Based on the previous study, C. Cardone-Riportella, A. Trujilo-Ponce and A. Briozzo (2011) analyze 24 financial indicators in the year before bankruptcy and, using logistic regression, they develop a special model for estimating the one-year probability of the nonpayment of small and medium-sized enterprises for Spanish firms. They also examine the impact of the Internal Ratings-Based approach (IRB) on a bank's

capital requirements in the portfolios of Spanish SMEs.

O. M. Dănilă (2012) deals with the application of credit scoring in order to quantify the probability of the bankruptcy of bank clients in Romania, highlighting the Z-score model and Moody's KMV EDF RiskCalc Model. Also referring to the paper written by E. Altman and G. Sabato (2005), logistic regression is used to estimate the probability of bankruptcy on the example of the 2,800 small and medium-sized enterprises that went bankrupt within 12 months.

Based on the unique set of data on the loans granted to German small and medium-sized enterprises, P. Behr and A. Güttler (2007) apply the logistics trend so as to assess the credit scoring model, the aim of which is to enable small and medium-sized enterprises to assess the expected probability of default. According to the authors, banks lack adequate incentives to increase the transparency of the credit risk measurement process, as their superiority in having customer information gives them an advantage over competing banks.

E. Altman, M. Esentato and G. Sabato (2018) point to the problems of information asymmetry in the financing of small and medium-sized enterprises by issuing bonds (in Italy, the SME bond market is known as "mini-bonds"). In order to achieve the required transparency of risk assessment, the authors of this study develop a model for assessing the creditworthiness of Italian small and medium-sized enterprises based on logistic regression and test it on the companies that issued mini-bonds. To assess the probability of the occurrence of the default status, they use the so-called Bond Rating Equivalents (BRE) and Mortality Rate Approach, which will be explained later.

Based on the above research, the next part of the paper deals with the assessment of the probability of the occurrence of the default status of small and medium-sized enterprises.

## A Methodological Approach to Estimating the Probability of Bankruptcy by Using the Z-Score Model

In this part of the paper, the way how the well-known Altman Z-Score model can be used for the purpose of estimating the probability of the occurrence of the default status is presented. The process involves the following three steps:

- determining credit scores for a new debt or for the existing debt,
- determining the so-called Capital market risk equivalents - most often bond rating equivalents (BRE),
- assessing the probability of the default status by determining the "mortality rate" or by using the average probability of the default of the companies published by credit rating agencies.

To create the Z-Score model, E. Altman (1968) used the discriminant function that transforms individual variables into a single discriminant score, or the Z value:

$$Z = V_1 X_1 + V_2 X_2 + V_n X_n \quad (7)$$

where:

$V_1, V_2, V_n$  = the discriminant coefficients, and  
 $X_1, X_2, X_n$  = the independent variables.

Having applied discriminant analysis, E. Altman obtained the following linear equation based on the five financial indicators: liquidity, profitability, indebtedness, solvency and the sales activity:

$$Z = 1.2 X_1 + 1.4 X_2 + 3.3 X_3 + 0.6 X_4 + 1.0 X_5 \quad (8)$$

where:

$X_1$  = net working capital/total assets,

net working capital = (current assets – short-term liabilities)

$X_2$  = retained earnings/total assets,

$X_3$  = earnings before interest and taxes/total assets,

$X_4$  = the market value of equity/total liabilities, and

$X_5$  = sales/total assets.

The classification of whether a corporate entity will go bankrupt or not was made based on the results of determining the "safe" zone for the values of the Z indicators greater than 2.99, and the "financial problems" zone or the "bankruptcy" zone ("Distress") for the Z values of less than 1.81, between which there was the middle, "Gray" zone, which included the companies whose Z value was within the range from 1.81 to 2.99 ( $1.81 < Z < 2.99$ ). The zones were selected by Altman based on the results obtained on a sample of 66 manufacturing firms (33 in the bankrupt group and 33 in the nonbankrupt group) observed in the period from 1946 to 1965. E. Altman (2018) emphasizes the fact that the model shows high accuracy in predicting bankruptcy (between 82% and 94%) one year after the assessment based on the original data, as well as on the data pertaining to 86 problematic companies in the period from 1969 to 1975, the 110 companies that went bankrupt in the period from 1976 to 1995, and 120 companies in the period from 1997 to 1999.

E. Altman (1983) revised the Z-Score so as to adjust it for the assessment of non-joint stock companies. Said revision included changes in the indicator  $X_4$ , so that it was determined on the basis of the book value of capital instead of being determined based on the market, which enabled the inclusion of non-joint stock companies whose shares were not listed on the stock exchange. This change is particularly important in the markets where the market price is not considered as the good indicator of value due to the market size, the low trading volume, or illiquidity. The Z'-score model was developed, which took the following form:

$$Z' = 0.717 X_1 + 0.847 X_2 + 3.107 X_3 + 0.420 X_4 + 0.998 X_5 \quad (9)$$

If the value of Z' is greater than 2.9, the company is in the "safe" zone, and if it is less than 1.23, the company is in the "financial problems" zone.

E. Altman, J. Hartzell and M. Peck (1995) conducted another revision of the model applied to emerging market corporations, which could be used to assess the ratings of private manufacturing and non-manufacturing companies in developed and emerging markets. In addition to the previous change made in the indicator  $X_4$ , which in that version of the model was not determined based on the market value

of capital, but based on the book value of capital, in this version of the model they excluded the indicator  $X_5$ , because it was particularly sensitive to differences in certain manufacturing and non-manufacturing sectors when retail or service companies were compared with certain manufacturing companies.

As a result, they obtained the Z''-score model in the form of the following linear equation:

$$Z'' = 3.25 + 6.56 X_1 + 3.26 X_2 + 6.72 X_3 + 1.05 X_4 \quad (10)$$

A Z''-score less than 4.35 indicates the fact that the company is in the "financial problems" zone, and a Z''-score greater than 5.85 indicates the fact that the company is in the "safe" zone.

When calculating the Z''-score in emerging markets, E. Altman, J. Hartzell and M. Peck (1995) proposed that a constant (+3.25) should be added in order to standardize the results, so that a score equal to or slightly below or above 0 would be equivalent to the situation in which the default status occurred, i.e. in the D rating category, in accordance with the Standard and Poor rating marks. The D rating is assigned when S&P Global Ratings believe that bankruptcy will happen and that the debtor will not pay all or substantially all the amount of his obligations as they fall due.

E. Altman, A. Danovi and A. Falini (2013) applied the Z''-score model in order to predict the corporate failure of the Italian banks in which extraordinary administration was introduced. The model showed great accuracy in predicting bankruptcy (in as many as 95.5% of the cases) in the year preceding the declaration of bankruptcy. These results determined J. R. Chieng (2013) to apply this model to the banks of the Euro Area, and the results of the research showed that the Z''-score model was a reliable indicator of the failure of the banks in the Euro Area within five years before bankruptcy. However, as the author himself stated, this model might not be as precise in another industry or institution not operating in the Euro Area.

Table 1 shows the different rating categories according to the Standard and Poor average Z-scores, the average Z''-scores in emerging markets (Average EM Score),

**Table 1** The relationship between the results of the Z-score, the Standard and Poor ratings, and the probability of the default of companies in emerging markets

Zone	S&P Rating	The amount of credit risk	Average Z-Score 1996 - 2001*	Average Z"-score in emerging markets*	The average probability of the default of a company during one year (1981-2019)**
Safe	AAA	minimal	6.20	8.15	0.00%
	AA	very low	4.73	7.30	0.00%
	A	low	3.74	6.65	0.03%
	BBB	moderate	2.81	5.85	0.12%
Gray	BB	considerable	2.38	4.95	0.53%
	B	high	1.80	4.15	3.03%
Distress	CCC	very high	0.33	2.50	18.25%
	D	bankruptcy		0	

Source: Altman, Hotchkiss & Wang, 2019; Default, Transition and Recovery, 2019.

and the historical average cumulative probabilities of the default of companies during one year in emerging markets.

The bond rating equivalent allows Z-score models to be used to assess the probability of default. In the markets with a long history and a fairly large number of the rated bonds that have found themselves in the default status, Z-score results can be linked to their ratings and based on the updated databases of the so-called "static pools". S&P rating agencies or dynamic-cohort rating agencies Moody's (Hamilton & Cantor, 2006) obtain PD values over a period of time starting from the rating date. For the companies that are not rated, the results of the Z-score can be linked to the bond rating equivalent. Comparing the values of the Z-score results and S&P ratings, E. Altman demonstrated a decline in the value of the Z-score results, which was most dominant in the companies with the AAA and AA ratings - the average Z-score decreased to 4.13 in 2013 from the high 5.20 in the period from 1996 to 2001, but it was even more significant for the companies with the single B rating - the average Z-scores decreased from 1.87 in the period from 1992 to 1995 to 1.70 in 2017. These changes led to an increase in the Type II Error, i.e. the companies were classified into the bankruptcy zone without the occurrence of that; therefore, E. Altman proposed that the equivalent to the bond rating should be used

instead of the limit 1.8 based on the original sample.

An alternative to the above-described approach is to use the E. Altman "Mortality Rates" approach based on the estimate of the expected bankruptcy rate from the original bond issuance date. E. Altman and H. J. Suggit (2000) also apply this concept to bank loans and estimate annual mortality rates and compare these results with the mortality rates of the publicly traded bonds during the sample period (1991-1996). Following this work, J. Fidrmuc, C. Hainz and A. Malesich (2007) set a Marginal Mortality Rate (MMR) for the 700 short-term loans granted to Slovakian small and medium-sized enterprises between January 2000 and June 2005.

The following analysis is focused on the application of the Z-score model in order to assess the probability of default, and it demonstrates the impact of this parameter on the assessment of credit risk within the Basel II concept.

#### CREDIT RISK ASSESSMENT ON THE SELECTED SAMPLE OF SMES IN SERBIA

The website of the Business Registers Agency, which provides information on the business entities

registered within a certain group of the activities and a public information portal to promote transparency in conducting the bankruptcy proceedings of the Bankruptcy Trustee Licensing Agency was used as a source of necessary financial data on the small and medium-sized enterprises operating in the territory of the Republic of Serbia for the purpose of assessing credit risk.

Since the formation of the database of the necessary data required considerable manual work, our paper is limited to the analysis of the companies registered in accordance with the Statistical Office of the Republic of Serbia (Official Gazette of the RoS, no. 54/2010), whose activities imply the production of cocoa, chocolate and confectionery (Group 10.82).

In July 2020, a total of 39 companies were registered for the production of cocoa, chocolate and confectionery products with the Business Registers Agency (Group 10.82). As many as 13 bankruptcy proceedings of the companies registered in this group of activities were registered on the public information portal promoting transparency in conducting bankruptcy proceedings in the period from 2010 to July 2020.

As displayed on the website of the Register of Financial Statements that started operating within the Business Registers Agency on 1<sup>st</sup> January 2010, starting from 2016, publicly available financial reports will be based on the three small and medium-sized companies in which bankruptcy proceedings were initiated in 2019 and 2020 and which had performed business activities in 2017 (namely Vekić Chocolate Ltd from Temerin, Tomaco Line Ltd from Leskovac, and Dunja Ltd from Belgrade). The sample of the companies that operated in 2020 consists of the randomly selected 10 small and medium-sized enterprises from this group of activities.

The goal of the following analysis is not only to check the accuracy of the Z-score model in predicting bankruptcy, but also to look at the financial health of this segment of the industry and demonstrate how Z-score results can be related to the equivalent of bond rating.

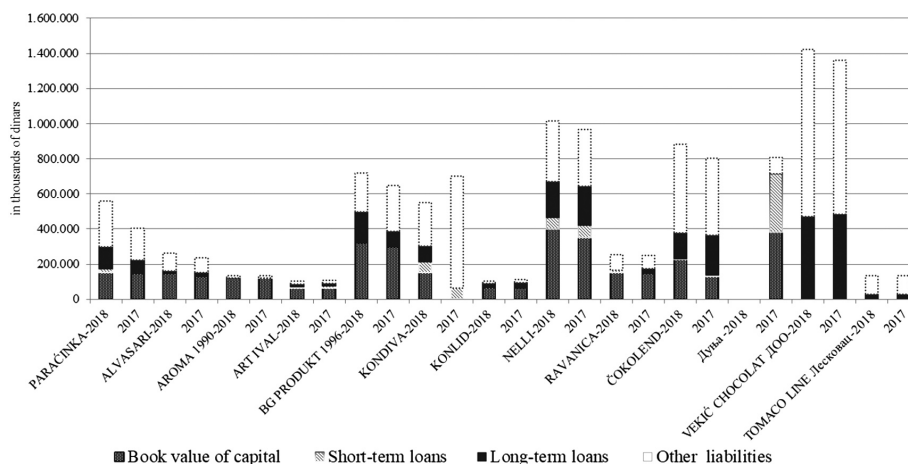
Given the fact that Z-score methods are based on accounting data, the accuracy of financial statements

is extremely important. Therefore, it should be noted that one of the selected companies in bankruptcy is not subject to audit, and one received a qualified opinion in 2017. Also, only two of the selected 10 active companies were classified into the category of medium-sized legal entities and were subject to audit.

A comparative presentation of the capital and liabilities based on the long- and short-term bank loans of the selected companies in 2017 and 2018 indicates the presence of over-indebtedness in some companies and confirms the fact that loans from commercial banks are the most important external source of financing for small and medium-sized enterprises in this group in the Republic of Serbia (Figure 1).

Based on the balance sheets of the three companies in bankruptcy, it can be noticed that the two companies, namely Vekić Chocolate and Tomaco Line, borrowed long-term loans, and the largest part of the liabilities were liabilities to suppliers. Unlike these two companies, the company Dunja Ltd Belgrade did not have long-term credit arrears, and on 31<sup>st</sup> December 2017, the short-term loan approved by Direktna banka JSC Kragujevac accounted for 79% of all the liabilities of the company. As far as active companies are concerned, these recorded an increase in credit indebtedness in 2018 compared to 2017, namely Paraćinka, Bg produkt 1996 and Kondiva, which are classified in the following analysis into the group of the companies with a high and very high credit risk.

Because the equivalent bond rating is not determined in the literature on the basis of the results of the Z'-score model, the values of the Z''-score were first calculated, for whose calculation the book value of capital was also used. However, the results of the Z''-score model obtained based on the annual financial statements for the year 2017 showed that the company Dunja, which was in bankruptcy, had operated in the safe zone, and based on the equivalent bond rating the company was assigned the BBB rating, so it is believed that this indicator cannot be considered as reliable for assessing the credit risk of the SMEs belonging to the Activity Group 10.82 in the observed period. A decision was brought to analyze the results of the application of the Z-score model if the book value of capital was included instead of the market value



**Figure 1** The ratio of the capital and liabilities of the selected companies in 2017 and 2018

Source: Serbian Business Registers Agency, 2020.

of capital and if that was compared with the results of the application of the Z'-score model, because it involved the use of the book value of capital. The results of the application of the Z-score, Z'-score, and Z'-score models for the years 2017 and 2018 are shown in the following (Table 2 and Table 3).

The application of the results of the Z-score models shows that, in 2017, a total of six companies were classified in the category of the companies with financial problems based on the bond rating equivalent of the three companies classified into the group assigned the D rating, and the other three companies with the CCC rating. All the three companies in which bankruptcy was initiated in 2019 and 2020 are classified into the "financial problems" zone.

In the period of two years after the assessment, the companies classified into the safe zone did not went bankrupt, while the three companies classified into the "financial problems" zone did not go bankrupt.

The following part of the paper shows the extent to which the allocation of SMEs into the category of exposure to individuals affects the capital adequacy requirements. As in E. Altman and G. Sabato (2005), the LGD of 45% is used, as suggested for the basic approach, based on the internal rating for the older

claims that are either unsecured or secured by unrecognized collateral. According to (OECD, 2020), the share of the loans granted to small and medium-sized enterprises in Serbia that required collateral in 2018 was 53.1%. To calculate the cumulative weighted capital requirement for credit risk, the previously presented average probabilities of the default of the company during one year estimated by the S&P rating agency were used and that the company's share in each rating category was identical to our sample was assumed.

When calculating a capital requirement for credit risk when an SME is classified into the category of exposure to companies, the effective maturity of the credit exposure is assumed to be three years (Table, 4). In 2018, the long-term loans accounted for 77.2% of the total loans granted to small and medium-sized enterprises in Serbia, and for about 87% in the selected sample of companies.

Increasing effective maturity by one year in the given example would increase capital requirements by about 2.75% (Table 5).

The preliminary results show that, if SMEs are classified into the category of exposure to natural persons, a capital requirement will amount to 3.96% according to the assumptions, whereas if SMEs are

**Table 2** The results of the application of the Z-score, Z'-score and Z''-score models for 2017

Name	Z''-score	Rating	PD	Zone	Z'-score	Zone	Z-score	Rating	PD	Zone
AROMA 1990	16.67	AAA	0.00%	Safe	5.33	Safe	7.36	AAA	0.00%	Safe
CONLID	10.62	AAA	0.00%	Safe	2.95	Safe	3.78	A	0.03%	Safe
ALVASARI	10.24	AAA	0.00%	Safe	3.01	Safe	3.78	A	0.03%	Safe
ART IVAL	8.24	AAA	0.00%	Safe	2.54	Gray	3.24	BBB	0.12%	Safe
BG PRODUCT 1996	5.72	BB	0.53%	Gray	1.85	Gray	2.19	B	3.03%	Gray
PARAĆINKA	5.17	BB	0.53%	Gray	1.60	Gray	1.82	B	3.03%	Gray
RAVANICA	4.58	B	3.03%	Gray	1.37	Gray	1.80	B	3.03%	Gray
NELLI	5.31	BB	0.53%	Gray	1.46	Gray	1.76	CCC	18.25%	Distress
DUNJA *	5.93	BBB	0.12%	Safe	1.13	Distress	1.44	CCC	18.25%	Distress
CHOCOLATE	3.27	CCC	18.25%	Distress	1.03	Distress	1.05	CCC	18.25%	Distress
VEKIĆ CHOCOLAT doo *	1.92	D		Distress	0.19	Distress	0.11	D		Distress
TOMACO LINE Leskovac *	1.13	D		Distress	0.01	Distress	0.00	D		Distress
KONDIVA	-5.30	D		Distress	-1.36	Distress	-1.93	D		Distress

\* Bankrupt company

Source: Authors

**Table 3** The results of the application of the Z-score, Z'-score and Z''-score models for 2018

Name	Z''-score	Rating	PD	Zone	Z'-score	Zone	Z-score	Rating	PD	Zone
AROMA 1990	16.78	AAA	0.00%	Safe	5.27	Safe	7.33	AAA	0.00%	Safe
CONLID	10.73	AAA	0.00%	Safe	3.34	Safe	4.27	A	0.03%	Safe
ALVASARI	10.32	AAA	0.00%	Safe	2.94	Safe	3.74	A	0.03%	Safe
ART IVAL	8.52	AAA	0.00%	Safe	2.51	Gray	3.24	BBB	0.12%	Safe
BG PRODUCT 1996	6.76	A	0.03%	Safe	1.93	Gray	2.34	B	3.03%	Gray
RAVANICA	5.62	BB	0.53%	Gray	1.72	Gray	2.18	B	3.03%	Gray
NELLI	5.72	BB	0.53%	Gray	1.77	Gray	2.12	B	3.03%	Gray
KONDIVA	4.99	BB	0.53%	Gray	1.72	Gray	1.89	B	3.03%	Gray
CHOCOLATE	4.61	B	3.03%	Gray	0.95	Distress	1.64	CCC	18.25%	Distress
PARAĆINKA	3.38	CCC	18.25%	Distress	1.50	Gray	1.02	CCC	18.25%	Distress
TOMACO LINE Leskovac *	2.03	D	100%	Distress	0.02	Distress	0.04	D	100%	Distress
VEKIĆ CHOCOLAT doo *	1.66	D	100%	Distress	-0.07	Distress	-0.18	D	100%	Distress
DUNJA *										

\* Bankrupt company

Source: Authors

**Table 4** The capital requirement for exposure to individuals

Rating	PD	LGD	R	K	Weight	Total weighted K
AAA	0.00%	45%	0.15995	0.00022	0.1	0.00%
AA	0.00%	45%	0.15995	0.00022	0	0.00%
A	0.03%	45%	0.15864	0.00377	0.2	0.08%
BBB	0.12%	45%	0.15465	0.01081	0.1	0.19%
BB	0.53%	45%	0.13799	0.02835	0	0.19%
B	3.03%	45%	0.07502	0.05332	0.4	2.32%
CCC	18.25%	45%	0.03022	0.08183	0.2	3.96%

Source: Authors

**Table 5** The capital requirement for exposure to companies

Rating	PD	LGD	R	b	M	K	Weight	Total weighted K
AAA	0.00%	45%	0.20438	0.56130	3	0.00325	0.1	0.03%
AA	0.00%	45%	0.20438	0.56130	3	0.00325	0	0.03%
A	0.03%	45%	0.20266	0.31683	3	0.01093	0.2	0.25%
BBB	0.12%	45%	0.19746	0.23711	3	0.02382	0.1	0.49%
BB	0.53%	45%	0.17651	0.16449	3	0.05033	0	0.49%
B	3.03%	45%	0.11082	0.09614	3	0.08650	0.4	3.95%
CCC	18.25%	45%	0.08446	0.04482	3	0.16095	0.2	7.17%

Source: Authors

classified into the category of exposure to companies, a capital requirement will be 1.81 times as high if the effective maturity of such credit exposure is three years.

## CONCLUSION

The presented results of the research study show that, to some extent, Z-score models can detect the companies in which bankruptcy may occur in the two years after an assessment, but they cannot be considered as reliable for assessing the probability of the bankruptcy of the small and medium-sized enterprises engaged in the production of cocoa, chocolate and confectionery in Serbia. When interpreting the obtained results, we should bear in mind the fact that Z-score models are based on data from the past and that the environment in which

SMEs operate has recently been exposed to dramatic changes. In addition to the above-said, one of the most important limitations of the research study is the fact that, at the time of writing the paper, only financial statements starting from 2016 to 2018 were publicly available on the website of the Register of Financial Statements, for the reason of which fact it was impossible to cover the research study for a longer period of time and thus provide a more reliable assessment and the development of a more adequate model by increasing the sample size.

The contribution made by this paper reflects in the fact that, regardless of the above-mentioned data limitations and the limitations regarding the applied method, a comparative overview of the companies and their ranking in accordance with the assessed credit risk is provided, simultaneously giving a more transparent insight into the state of this segment of

the industry as well. This research study is based on the hypothesis that an increase in the transparency of the credit risk measurement process is in the interest of SMEs and that a greater transparency is also in the interest of all creditors, primarily banks, because untimely noticed problems might have unforeseeable consequences for the entire banking sector, depending on the concentration of the loans granted to SMEs. As in P. Behr and A. Güttler (2007), it is considered that increasing the transparency of the credit risk measurement process and reducing the asymmetry of information will provide borrowers with the ability to negotiate loan terms based on more information and that it will also increase the likelihood of a successful change of one bank for another that provides better terms. It will also create the opportunities for using alternative sources of financing, thus expanding the scope of financing opportunities for companies.

Given the fact that the results of the research study show that Z-score models cannot be considered as reliable for assessing the probability of the bankruptcy of small and medium-sized enterprises, directions for further research will be focused on the development of the credit scoring models adapted to the market of the small and medium-sized enterprises of the Republic of Serbia, which will enable greater transparency in credit risk assessment.

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## MERENJE RIZIKA POZAJMLJIVANJA MALIM I SREDNJIM PREDUZEĆIMA U REPUBLICI SRBIJI U SVETLU SAVREMENIH BANKARSKIH REGULATIVA

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Predmet ovog rada je merenje rizika pozajmljivanja malim i srednjih preduzećima (MSP), sa aspekta postojećih bankarskih regulativa. U radu se polazi od hipoteze da bi povećanje transparentnosti procesa merenja kreditnog rizika omogućilo blagovremeno otkrivanje problema i ostavilo prostor za preduzimanje neophodnih radnji za upravljanje malim i srednjim preduzećima, kao i svim poveriocima, i da bi, na taj način, MSP dobila priliku da se obezbede povoljniji izvori finansiranja. U istraživanju je korišćen Altman-ov Z-skor model za procenu verovatnoće, da se preduzeća neće pridržavati svojih ugovornih obaveza i za rangiranje privrednih društava. Rezultati primene Z-skor modela ukazuju na činjenicu da se tim modelima, u izvesnoj meri, mogu otkriti ona privredna društva koja će u periodu od dve godine nakon izvršene procene možda proglasiti stečaj, s jedne strane, ali da se oni ne mogu smatrati pouzdanim kada je u pitanju procena verovatnoće da će doći proglašenje stečaja u malim i srednjim preduzećima u Republici Srbiji.

**Ključne reči:** finansiranje MSP, kreditni rizik, zahtevi kapitala, kreditno bodovanje, ekvivalent za ocenjivanje obveznica

JEL Classification: G21, G28



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