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TROŠAK KAPITALA – EFEKTI NA VREDNOST I PROFITABILNOST PREDUZEĆA: EVIDENCIJA ODABRANE SKUPINE PREDUZEĆA NA SARAJEVSKOJ I BANJALUČKOJ BERZI

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Rezime: Prosečno ponderisana stopa povrata predstavlja stopu koju preduzeća moraju platiti akcionarima i kreditorima. Dakle, to je prilagođena diskontna stopa prema rizicima za novčane tokove preduzeća. U radu će se proračunati prosečna ponderisana stopa povrata za odabranu skupinu preduzeća koja kotiraju na Sarajevskoj i Banjalučkoj berzi hartija od vrednosti, kao i pokazatelji profitabilnosti ROA, ROE i neto profitna marža. Dakle, osnovni cilj ovog rada je da se istraži da li postoji međuzavisnost u kretanju prosečne ponderisane stope povrata i indikatora profitabilnosti odabrane skupine preduzeća u sastavu berzanskih indeksa SASX-30 i BIRS. Rezultati istraživanja pokazuju da se WACC kreće u rasponu od minimalnih 5.11% do maksimalnih 10.87%. Isto tako rezultati istraživanja pokazuju da egzistira negativna povezanost i korelacija između WACC, s jedne strane i odabrane skupine pokazatelja profitabilnosti, sa druge strane.

Ključne reči: trošak akcijskog kapitala, WACC, korelacija, beta koeficijent, ROA, ROE, neto profitna marža.

JEL klasifikacija: G10, G12, G23

Uvodna razmatranja

Finansije su veoma važne za celi privredni sektor kao i za njegove učesnike, odnosno za opstanak, rast i širenje poslovanja, što su tri glavna cilja svake organizacije. Finansijski učinak je mera koliko dobro preduzeće može da koristi sredstva od svoje glavne delatnosti. Finansiranje nije besplatno jer prouzrokuje oportunitetni trošak za investitora, što svakako predstavlja prihod koji bi on zaradio da je uložio sredstva u sledeću najbolju alternativu.

Najvažniji metod u saopštavanju finansijskih informacija o finansijskom položaju i finansijskom uspehu preduzeća su svakako finansijski izveštaji. Dakle, ako preduzeće želi da prikupi sredstva na međunarodnom tržištu kapitala ili da investira u stranoj zemlji, investitori ili vlasnici preduzeća treba da analiziraju finansijske informacije uz pomoć finansijskih izveštaja.

U ovoj eri globalizacije i konkurentnog poslovnog sveta, odluke o finansiranju igraju značajnu ulogu u održavanju profitabilnosti preduzeća. Iako su se mnoge teorije finansiranja pojavile tokom vremena, nijedna od njih ne može u apsolutnoj meri sugerisati na optimalan nivo strukture kapitala. Izbor strukture kapitala je jedna od najvažnijih odluka za preduzeća jer može uticati na zaradu akcionara i vrednost preduzeća. Preduzeća se pored finansiranja sopstvenim kapitalom finansiraju i zaduživanjem, odnosno pozajmljivanjem finansijskih sredstava, bilo od strane banaka, pojedinaca i ostalih izvora. Na pozajmljeni iznos preduzeće plaća kamate, odnosno plaća cenu svoga zaduživanja. Plaćanje koje preduzeće vrši za kamate, služi mu za smanjenje poreske osnovice jer se kamate priznaju kao rashodi. Oslanjanje u većem obimu na finansiranje putem duga moglo bi povećati rizik preduzeća i konačno troškove stečaja preduzeća. S druge strane, finansiranje izdavanjem akcija i izbegavanjem duga moglo bi poslati pogrešne signale investitorima o finansijskom statusu preduzeća, što bi moglo povećati mogućnost neprijateljskog preuzimanja. Preduzeća pokušavaju da pronađu optimalnu strukturu kapitala koja će uticati da se minimizira ukupni trošak kapitala.

WACC se služi diskontnom stopom za projekte koje je preduzeće preuzelo (Ross, 2007). Obično viša diskontna stopa rezultira manjim novčanim tokovima i to konsekventno rezultira manjim novčanim tokovima, i na kraju implicira nisku neto sadašnju vrednost projekta. Projekat niske neto sadašnje vrednosti dovodi do pada profitabilnosti preduzeća (Miglo, 2012).

Ovo istraživanje će se baviti proračunom prosečne ponderisane stope povrata koju preduzeće mora platiti akcionarima i kreditorima. Za prosečnu ponderisanu stopu povrata obično se kaže da odražava rizik budućih novčanih tokova za kreditore i akcionare. Dato je prihvatljivo, jer je izveden trošak kapitala iz očekivanih budućih plaćanja akcionarima, zatim trošak duga iz stope koju zahtevaju kreditori preduzeća za novac koji pozajmljuju. S tim u vezi se može reći da prosečna ponderisana stopa povrata predstavlja ponderisani prosek rizičnosti novčanih tokova akcionara i kreditora (Vukičević i ostali, 2010). U istraživanju će biti takođe proračunati indikatori profitabilnosti poslovanja odabrane skupine preduzeća koja se kotiraju na Sarajevskoj i Banjalučkoj berzi hartija od vrednosti. Statistički alat koji će se koristiti za pronalaženje uticaja cene kapitala na profitabilnost preduzeća biće korelaciona analiza.

Rad je struktuiran iz pet delova. Prvi deo odnosi se na uvodna razmatranja sa akcentom na opis definicije prosečno ponderisanog troška kapitala. Drugi deo opisuje pregled dosadašnjih istraživanja u kontekstu uticaja prosečno ponderisanog troška kapitala na indikatore profitabilnosti poslovanja. Treći deo opisuje izabranu metodologiju istraživanja, sa posebnim fokusom na potrebne formule za proračun prosečnog ponderisanog troška kapitala i indikatora profitabilnosti. Četvrti deo odnosi se na podatke neophodne za analizu. Peti deo predstavlja dobijene rezultate istraživanja, kao i određena zapažanja i preporuke.

Pregled relevantne literature

Struktura kapitala je način finansiranja imovine preduzeća kroz određenu kombinaciju vlasničkih, dužničkih ili hibridnih hartija od vrednosti. Dakle, struktura kapitala preduzeća je sastav njegovih obaveza (Khadka, 2007). Prema teoriji Modigliani-Miller, vrednost preduzeća se određuje kroz profitabilnost, bez obzira na strukturu kapitala. Ne postoji direktna veza između profitabilnosti i strukture duga, kao i WACC preduzeća (Higgins, 2005). Prema studiji koju su sproveli Hussain i Chakraborty (2010) na primeru 24 komercijalne banke koje su kotirane na berzi u Dhaka u Bangladešu u periodu od januara 2006. godine, do decembra 2008. godine, došli su do zaključka da postoji jaka negativna korelacija između troška kapitala i prinosa komercijalnih banaka.

Profitabilnost ima značajno negativnu vezu sa leveridžom i kratkoročnim finansiranjem kada je izvor samo eksterno finansiranje i kada su dividende fiksne, tako da se profitabilnost negativno menja sa promenom nivoa leveridža (Rajan i Zingales, 1995).

Chowdhury i Chowdhury (2010) su pokušali da objasne odnos strukture kapitala i vrednosti preduzeća u Bangladešu, i otkriju da optimalna ravnoteža duga i kapitala može maksimizirati zahteve akcionara za bogatstvom. Takođe su zaključili da trošak kapitala treba da bude što niži, jer negativno utiče na izbor strukture kapitala.

Prema studiji koju su sproveli Tashfeen and Liton (2010) postoji jaka negativna korelacija između cene kapitala komercijalnih banaka i njihovih prinosa. Analiza je sprovedena na 24 kotirane komercijalne banke na berzi u Daki, Bangladešu u periodu od januara 2006., do decembra 2008. godine.

Momčilović i Vlahović Begović (2020) su ispitivali vezu između prosečne ponderisane cene kapitala i koeficijenata profitabilnosti za četiri kompanije. Autori ističu da iako se očekuje da kompanije sa najnižim WACC imaju najviše ključne koeficijente profitabilnosti, rezultati istraživanja pokazuju drugačije. Takođe, autori ističu da ima smisla koristiti skupe izvore kapitala sve dok se kapital koristi na profitabilan način.

Singapourwoko i El-Wahid (2011) su sproveli istraživanje na 48 kompanija za period od 2003 do 2008. godine, koje kotiraju na Indonežanskoj berzi i pronašli su značajan pozitivan odnos između leveridža i profitabilnosti. S druge strane, Ragil i Solimon (2014) su pronašli različite rezultate sprovodeći studiju na 60 kotiranih preduzeća iste berze. Uzorak su podelili u dva klastera, i to 30 malih preduzeća i 30 velikih preduzeća. Rezultati su pokazali značajan negativan odnos za niži klaster, te beznačajan odnos leveridža i vrednosti preduzeća za gornji klaster, tj. velika preduzeća.

Hussain i Islam (2012) su pronašli negativnu korelaciju između prinosa na kapital i ponderisanog prosečnog troška kapitala. U njihovom istraživanju je primenjen ponderisani prosečni trošak kapitala u odnosu na model premije rizika, Gordonov model, kao i Fama-French model na industriju cementa iz Pakistana. Rezultati istraživanja su izmerili uravnotežen uticaj troška kapitala na prinos na kapital u industriji cementa, pod pretpostavkom da nivo menadžerske, kao i operativne kompetencije u svim preduzećima koja posluju u ovoj industrijskoj grani i dalje ostaju nepromenjeni.

Sharma (2012) je uradio analizu troškova kapitala i profitabilnosti telekomunikacijskog sektora. Cilj autora je bio da analizira odnos između cene kapitala i profitabilnosti preduzeća. Autor je otkrio da visoka cena kapitala negativno utiče na profitabilnu poziciju preduzeća. Takođe, autor sugeriše da su finansije važan aspekt za svaki posao, te da se koriste odgovarajući izvori finansiranja, kako bi se osiguralo da je cena kapitala pod odgovarajućom kontrolom. Svakako alati su kalkulacije i formule cene kapitala.

Gilchrist i Zakrajsek (2007) su ispitivali u svojoj studiji odnos ulaganja i cijene kapitala koristeći tržište korporativnih obveznica kao dokaz. Oni su se fokusirali na varijacije koje se javljaju u kamatnim stopama na investicionu potrošnju i njihove efekte na odluke o investiranju. Primenjen je regresioni model i zaključeno je da povećanje cene kapitala za 1 odsto dovodi do smanjenja ulaganja od 50 do 70 poena.

Frank i Goyal (2009) su istraživali strukturu kapitala američkih kompanija za period od 1950 do 2003. godine, i otkrili su doslednost sa modelom kompromisa. Dakle, američka preduzeća koriste kvalitetne eksterne izvore finansiranja za svoje poslovanje, pod uslovom da je trošak kapitala relativno nizak.

Bhayani (2009) je analizirao uticaj finansijske poluge na prosečnu cenu kapitala. Istraživanje je sproveo na odabranom uzorku cementnih preduzeća u Indiji za period od 2000 do 2008. godine. Izračunao je finansijski leveridž i ponderisanu prosečnu cenu kapitala i uporedio ih je koristeći koeficijent korelacije i analizu t-testa. Došao je do zaključka da nema uticaja finansijske poluge na cenu kapitala u industriji cementa u Indiji. Takođe, ustanovio je pozitivnu korelaciju između kompanija sa visokom i niskom polugom u odnosu na cenu kapitala.

Bhatnagar i ostali (2015) istraživali su identifikovanje optimalne strukture kapitala i cene kapitala. Dakle, pokušali su da analiziraju uticaj strukture kapitala i cene kapitala na maksimizaciju bogatstva akcionara proučavajući 12 kompanija sa najvećim neto vrednostima koje kotiraju na berzi. Alate koje su koristili za analizu su regresiona analiza, te korišćenje aritmetičke formule za izračunavanje strukture kapitala, bogatstva akcionara i cene kapitala. Rezultati studije pokazali su da postoji linearnost između cene kapitala i maksimizacije bogatstva akcionara, dok s druge strane ne postoji veza ili linearnost između maksimizacije bogatstva akcionara i strukture kapitala. Autori sugerišu da pri donošenju odluke o maksimizaciji bogatstva akcionara, menadžment mora uzeti u obzir dugoročni uticaj na kompaniju, i mora uzeti u obzir sve one faktore koji su odgovorni za maksimizaciju bogatstva akcionara.

Učkar i Urti (2015) su sproveli istraživanje na 24 preduzeća koja kotiraju na Zagrebačkoj berzi u sastavu berzanskog indeksa CROBEX, za period od 2011 do 2013. godine. Autori su pokušali ovim istraživanjem da dokažu uticaj finansijske strukture na poslovni rezultat, odnosno u kojoj meri struktura kapitala utiče na vrednost preduzeća. Kao varijable uzeli su zaduženost preduzeća, ROE i ROA. Rezultati istraživanja su pokazali kako nema tačnog odgovora koja teorija određuje strukturu kapitala. Sa druge strane utvrđeno je kako postoji negativna povezanost između strukture kapitala i poslovne izvrsnosti. Dakle, negativna povezanost nastaje kada je udeo zaduženosti u strukturi kapitala velik i na taj način utiče na slabljenje poslovne izvrsnosti.

Simmons i Banu (2016) su ispitivali ulogu cene kapitala, leveridža, dividendi i Tobinovog q pri donošenju odluke za korporativno ulaganje. Oni su otkrili vezu između datih nezavisnih varijabli sa investicijama uzimajući kvartalne podatke od 1987 do 2013. Za ispitivanje je korišćena VAR metodologija, gde su na kraju došli do zaključka da leveridž ima pozitivni efekat na investicije, dok trošak kapitala izaziva značajno negativan odgovor na ulaganja.

Bhargav (2017) je imao za cilj da analizira efekat finansijske poluge na cenu kapitala. Sproveo je istraživanje na uzorku od 28 kompanija koje kotiraju na Bombajskoj berzi za period od tri godine, tj. od 2013 do 2015. godine, u okviru berzanskog indeksa Sensex. Proračunao je odnos duga i kapitala i koeficijent pokrića kamata, kako bi analizirao odnos finansijske poluge i cene kapitala. U studiji je otkriveno da su finansijska poluga i cena kapitala u negativnoj korelaciji, jer dug smanjuje cenu kapitala i kamata se odbija od poreza. Otuda je podrazumevano da povećavanjem duga u strukturi kapitala preduzeće može da smanji cenu kapitala.

Parmjit i Neeti (2019) su ispitivali da li je trošak kapitala funkcija strukture kapitala ili ostaje nepromenljiv. Oni su pokušavali da analiziraju odnos između cene sopstvenog kapitala, cene kapitala, vrednosti firme i drugih finansijskih varijabli. Studija je rađena na 500 indijskih kompanija za period od 2008 do 2010. godine. Otkrili su da trošak kapitala ima uticaj na različite poslovne odluke na osnovu prirode delatnosti koja pomaže menadžerima da donose finansijske odluke kompanije da vodi firmu profitabilno. Autori sugerišu da prilikom donošenja odluka za finansijske varijable različiti faktori koji doprinose strateškoj efektivnosti treba, u prvom redu, razmotriti efikasnost preduzeća.

Metodologija istraživanja

Tržište kapitala u Bosni i Hercegovini spada u red malih rubnih tržišta kapitala (engl. frontier markets) koje karakteriše mala tržišna kapitalizacija i likvidnost, kao i relativna otvorenost i dostupnost za strane ulagače, ali i moguća veća ekonomska i politička nestabilnost, te potencijalno veći dugoročni povrat i mala korelacija sa drugim tržištima kapitala (Komisija za hartije od vrijednosti Republike Srpske, 2020). Izračunavanje dnevne stope prinosa na manjim tranzicijskim tržištima kakvo je i tržište kapitala u Bosni i Hercegovini predstavlja jedan od problema, s obzirom da nema jedinstvenog stajališta oko cene koju treba primeniti za proračun. U slučaju kada podaci o trgovanju unutar jednog dana nisu poznati, najčešće se koristi aritmetička sredina između najniže i najviše cene. Na razvijenim tržištima kapitala generalno se primenjuje zadnja cena kojom se trgovalo. Zadnja cena akcija se najčešće bira da bi se smanjila neusklađenost cena u okviru dnevnog trgovanja. Na tržištu kapitala u BiH uzimanje zadnje cene može dati iskrivljenu sliku stvarnih dnevnih događaja.

Cene akcija na BiH tržištu u toku dana značajno variraju, gde zadnja cena predstavlja tek jednu od datih oscilacija, a ne korekciju cene kao na razvijenim tržištima kapitala. Još jedan bitan razlog nerealnosti primene zadnje cene je činjenica da sami investitori manipulišu, odnosno podižu zaključnu cenu, s obzirom da se vrednost portfolija po margin kreditima proračunava po zaključnim cenama, tako da se podizanjem zaključne cene izbegava obaveza prenosa dodatnih hartija od vrednosti na akcionarski račun banke, kod koje je podignut margin kredit. Imajući sve u vidu, logičan izbor predstavlja prosečna ponderisana cena. Dakle, prosečna ponderisana cena se dobija zbrajanjem cena pojedinih transakcija tokom dana i njihovim ponderisanjem obimom pojedine transakcije, na sledeći način (Alihodžić, 2011):

$$p = \sum \frac{P_i}{X_i} \tag{1}$$

$$X_i = \frac{q_i}{Q}, \quad i = 1, \dots, N$$

gde je:

p - prosečna cena hartija od vrednosti;
P_i - cena pri transakciji (i);
X_i - odnos obima transakcija (i) i ukupnog obima trgovine tokom celog dana;
q_i - obim transakcije (i); i
Q - ukupan obim trgovine tokom celog dana.

Na gore opisan način se dobija najrealnija prosečna cena po kojoj se može vršiti trgovina određenog dana. Ovo istraživanje se bazira na stopama prinosa najlikvidnijih akcija kojima se trguje na Sarajevskoj i Banjalučkoj berzi hartija od vrednosti. Isto tako, ovo istraživanje je zasnovano na dnevnim stopama prinosa u cilju dodatnog smanjenja problema niske likvidnosti. Usled nedostatka podataka o isplatama dividendi, dividende nisu uzete u obzir prilikom izračunavanja dnevnih stopa prinosa odabranih akcija preduzeća. Dnevni prinos pojedine akcije će se računati na sledeći način:

$$r_{i,t} = \left(\frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}\right) x\ 100 \tag{2}$$

gde je:

$r_{i,t}$ - dnevni prinos akcije (i) za dan t;
$P_{i,t}$ - cena akcije (i) za dan t i
$P_{i,t-1}$ - cena akcije (i) za dan t-1.

Cene akcija odabranih preduzeća su preuzete sa web sajta Sarajevske berze hartija od vrednosti (www.sase.ba) i Banjalučke berze hartija od vrednosti (www.blberza.com) za period od 01.01.2018 do 31.12.2021. godine. Kao reper za tržišni portfolio u ovom istraživanju se koristi berzanski indeks Sarajevske berze SASX-30, kao i berzanski indeks Banjalučke berze BIRS. Dati indeksi su izabrani, zato što se smatraju visoko diversifikovanim i zato što opisuju stanje na većem delu tržišta kapitala u Bosni i Hercegovini.

Premija za rizik akcija se generalno definiše kao prosečna razlika stope prinosa na akcije u odnosu na niskorizičnu alternativu u vidu državnih obveznica ili trezorskih zapisa (Božović, 2021). Za premiju tržišnog rizika u ovom istraživanju se koristi premija rizika kapitala u Nemačkoj od 4.72%, što je preuzeto iz Damodoranove baze podataka (http://pages.stern.nyu.edu/~adamodar). Premija rizika u Bosni i Hercegovini koja iznosi 6.30% isto tako preuzeta je iz Damodaranove baze podataka (http://pages.stern.nyu.edu/~adamodar).

Da bi se procenila vrednost preduzeća koja koriste diskontovani novčani tok, potrebno je za prognozu slobodnog novčanog toka koristiti prosečni ponderisani trošak kapitala (engl. *weighted average cost of capital*- WACC), koji predstavlja oportunitetni trošak sa kojim se investitori suočavaju prilikom ulaganja svojih sredstava u jedan određeni posao, umesto u druge sa sličnim rizikom. Najvažniji princip koji leži u osnovi uspešne implementacije troška kapitala je doslednost između komponenti WACC i slobodnog toka gotovine. Ponderisani prosečni trošak kapitala (WACC) kombinuje stope prinosa koje zahtevaju vlasnici duga (k_d) vlasnici kapitala(k_e). Za preduzeće koje se finansira isključivo iz duga i kapitala WACC je definisan na sledeći način (Koller i ostali, 2010):

$$WACC = \frac{D}{D+E} k_d (1 - T_m) + \frac{E}{D+E} k_e \qquad (3)$$

gde se dug (D) i kapital (E) mere korišćenjem tržišnih vrednosti. Iz prethodne jednačine se može primetiti kako je trošak duga smanjen za graničnu poresku stopu T_m. Razlog za ovo je što je poreski štit isključen iz slobodnog novčanog toka. S obzirom da poreski štit na kamatu ima vrednost on mora biti uključen u procenu. Metod diskontovanog novčanog toka prilikom vrednovanja preduzeća vrednuje poreski štit na način da smanjuje prosečni ponderisani trošak kapitala.

Da bi smo odredili ponderisanu prosečnu stopu kapitala za određeno preduzeće, potrebno je da se procene tri komponente WACC, i to: trošak kapitala, trošak duga nakon oporezivanja i ciljna struktura kapitala preduzeća. S obzirom da ni jedna varijabla nije direktno uočljiva koriste se različiti modeli, pretpostavke i aproksimacije za procenu svake komponente. Ovi modeli procenjuju očekivani prinos na alternativne investicije sa sličnim rizikom koristeći tržišne cene. Zbog toga se termin očekivani prinos koristi naizmenično sa troškom kapitala. Kako se trošak kapitala takođe koristi za alokaciju kapitala unutar preduzeća, on se isto može nazvati zahtevanim prinosom ili stopom povrata.

Postoji nekoliko načina za proračun troška trajnog kapitala. Jedan od načina za proračun troška trajnog kapitala je upotreba modela za vrednovanje kapitalne imovine (engl. *Capital asset pricing model* - CAPM), odnosno za računanje tražene stope povrata. Prema ovom modelu tražena stopa povrata računa se na osnovu sledeće jednačine (Vidučić, 2006):

$$k_s = R_f + (R_m - R_f)\beta_j \qquad (4)$$

gde je:

R_f – stopa povrata bez rizika;
R_m- stopa povrata na tržišni portfolio i
β_j - mera sistematskog rizika za dato preduzeće.

Prema preporuci Damodarana, trošak akcijskog kapitala za tržišta u razvoju se može proračunati primenom sledeće formule (Damodaran, 2015):

$$k_{eei} = r_f + \beta_i RP + CRP \quad (5)$$

gde je:

r_f – bezrizična stopa na imovinu;
β_i - beta koeficijent odabrane skupine preduzeća;
RP - označava tržišnu riziko premiju; i
CRP- označava riziko premiju zemlje za Bosnu i Hercegovinu.

Prema Damodaran-u, premija rizika tržišta u razvoju sa političkim rizikom zemalja Istočne Evrope i Južne Amerike procenjuje se na 8.5% (Damodaran, 2002). Kako u Bosni i Hercegovini ne postoji zvanična statistika praćenja i računanja nerizične stope prinosa, u ovom istraživanju je uzeta prosečno ponderisana kamatna stopa na obveznice Vlade Federacije BiH od 0.75%[1] i prosečna ponderisana kamatna stopa na obveznice Vlade Republike Srpske od 2.70%. Dakle, prosečna ponderisana kamatna stopa u ovom istraživanju iznosiće 1.72% (https://www.mft.gov.ba).

Troškove dugoročnog zaduženja za odabrana preduzeća koja se kotiraju na Sarajevskoj i Banjalučkoj berzi hartija od vrednosti ćemo proračunati na osnovu podataka iz poslednjih finansijskih izveštaja, pomoću sledeće formule (Kočović i ostali, 2016):

$$k_{ds} = \frac{Neto\ finansijski\ rashodi}{Dugoročni\ dugovi} \quad (6)$$

Beta koeficijent meri intenzitet promena prinosa na akciju prema promenama prinosa na ukupno tržište akcija. Dakle, beta koeficijent objašnjava za koliko će se promeniti stopa prinosa posmatrane akcije ako se stopa prinosa tržišnog portfolija promeni za 1. Kako je za tržište, odnosno za tržišni portfolio $\beta = 1$ ako akcija preduzeća ima $\beta > 1$ onda će uvećati rizik portfolija, a s druge strane ako ima $\beta < 1$ onda će umanjiti rizik portfolija. Empirijski je potvrđeno da za beta koeficijente važi statistička pojava koja se zove regresija prema sredini. To praktično znači da hartije od vrednosti koje imaju visoku betu, odnosno $\beta > 1$u jednom periodu, u budućnosti će u principu imati nižu betu. Važi i sledeće, da hartije od vrednosti sa niskom betom, odnosno $\beta < 1$I u budućem periodu će imati višu betu. U ovom istraživanju beta će se prilagoditi da se ocena iz uzorka pomnoži sa 2/3, a vrednost 1,0 sa 1/3, tako da će korigovana beta biti: $\left(Korigovana\ \beta = \frac{2}{3} * \beta_{istorijska}\right)$ (Bodie i ostali, 2009). U ovom istraživanju beta koeficijent ćemo računati pomoću sledeće formule:

$$\beta_j = \frac{\sigma_j}{\sigma_M}\rho\left(r_j, r_M\right) \quad (7)$$

gde je:

σ_j - standardna devijacija hartije od vrednosti j;
σ_M - standardna devijacija tržišta; i
ρ - koeficijent korelacije.

[1] *Simbol emitovanih obveznica Vlade Federacije BiH je FBH60321 i datum emisije je 30.06.2021. godine, dok je simbol emitovanih obveznica Vlade Republike Srpske RSBD-025 i datum emisije 24.03.2021. godine.*

S obzirom da trošak kapitala koristi Nemačku stopu bez rizika, kao i premiju za rizik kapitala koje su date u eurima, trošak kapitala za preduzeća koja su uzeta u razmatranje se procenjuje na sledeći način (Damodaran, 2009):

$$k_{esi} = (1 + k_{eei}) \frac{(1+E(i_S))}{(1+E(i_e))} - 1 \quad (8)$$

gde je

$E(i_S)$ – očekivana inflacija u Bosni i Hercegovini i
$E(i_e)$ – očekivana inflacija u EU.

U cilju podrobnijeg analiziranja dobijenih rezultata u ovom istraživanju će pored prosečne stope prinosa i standardne devijacije odabrane skupine preduzeća biti proračunati i analizirani i viši momenti razdiobe oko sredine. Treći momenat oko sredine ili mera asimetrije (engl. skewness) opisuje odstupanja vrednosti numeričke varijable od aritmetičke sredine, kako bi prikazala način razmeštanja vrednosti varijable oko sredine (Lewis, 1973). Dakle, mera asimetrije se može definisati kao odnos trećeg momenta oko sredine i standardne devijacije na treću potenciju. Mera asimetrije se izračunava prema sledećoj formuli:

$$\propto_3 = \sum_{i=1}^{N} \left(\frac{X_i - u}{\sigma}\right)^3 \quad (9)$$

Pri normalnoj distribuciji mera asimetrije iznosi 0, odnosno jednaka je verovatnoća da se ostvari negativan ili pozitivan prinos. Mera asimetrije se obično kreće u intervalu ±2, a kada se radi o izrazito asimetričnom rasporedu prinosa poprima i veće vrednosti. Zaobljenost u okolini modalnog vrha krivulje distribucije frekvencija predstavlja spljoštenost (engl. kurtosis), koja se definiše kao odnos četvrtog momenta oko sredine i standardne devijacije na četvrtu potenciju (Šoškić i Serdar, 1994). Spljoštenost se u finansijama koristi za opisivanje ekstremnih događaja, odnosno onih događaja koji spadaju u sam rep distribucije. Spljoštenost se izražava pomoću sledeće formule:

$$\propto_4 = \sum_{i=1}^{N} \left(\frac{X_i - u}{\sigma}\right)^4 \quad (10)$$

U slučaju normalne distribucije spljoštenost iznosi 3. Čest uzrok nesporazuma pri oceni spljostenosti pojedine distribucije korišćenjem kompjuterskih programa za njegovo izračunavanje, jeste u tome što u većini matematičkih softverskih paketa, pa tako i u Microsoft Excelu, iznos spljoštenosti je već apriori umanjen za 3. Kako se mera povrata na ulaganje koristi u širokom spektru oblika sa drugim pokazateljima učinka, kao što je neto profit, ona je ovde ponovo eksplicitnije navedena u varijaciji prinosa na sredstva (ROA). Dakle, povrat sredstava uzima u obzir neto profit preduzeća, kao i troškove kamata i stavlja ih u vezu sa prosečnim ukupnim kapitalom koji obezbeđuju vlasnici kapitala i duga (Schmidlin, 2014):

$$Povrat\ na\ aktivu = \frac{Neto\ profit + troškovi\ kamata}{Ukupan\ bilans\ stanja} \quad (11)$$

Povrat na kapital (ROE) pokazuje prinos na kapital koji obezbeđuju akcionari. Da bi se izračunao ovaj važan koeficijent, neto profit se postavlja u odnosu na prosečni akcionarski kapital tokom poslovne godine. U proračunu je važno uneti neto profit i akcionarski kapital nakon što se odbiju manjinski interesi, kako bi se uzele u obzir samo brojke na koje akcionari stvarno imaju pravo.

$$Povrat\ na\ kapital = \frac{Neto\ profit}{Akcionarski\ kapital} \tag{12}$$

Ovaj odnos daje investitorima iznos koji se može porediti između različitih preduzeća i mogućnosti ulaganja. Nizak prinos na sopstveni kapital ukazuje na neefikasnu upotrebu kapitala ili precenjenost njegove imovine (a samim tim i akcionarskog kapitala). Zbog svoje veze između neto dobiti i akcionarskog kapitala, prinos na kapital čini centralni koeficijent profitabilnosti za akcionare. Neto profitna marža pokazuje koliko se centi profita ostvaruje po dolaru prodaje. Posebno preduzeća sa odličnom tržišnom pozicijom, strogom kontrolom troškova i niskim nivoom duga pokazuju veoma visoke neto profitne marže. Neto profitna marža se izražava na sledeći način:

$$Neto\ profitna\ marža = \frac{Neto\ profit}{Prodaja} \tag{13}$$

Tržišna moć i upravljanje troškovima imaju značajan uticaj na iznos neto profitne marže. Što je izraženija mogućnost prilagođavanja cena i istovremeno niži trošak, to je veća profitna marža. Iz datog razloga, preduzeća koja imaju monopolski ili oligopolski položaj obično pokazuju visoke neto profitne marže.

Podaci za analizu

Deskriptivna statistika u ovom istraživanju obuhvata period od 03. januara 2018. godine do 30. decembra 2021. godine što ukupno iznosi 1.011 dana. Selekcija akcija preduzeća u ovom istraživanju sprovedena je na način da su izabrane najlikvidnije akcije sa visokim prometom i tržišnom kapitalizacijom većom od medijane tržišne kapitalizacije iz različitih sektora delatnosti. Analizirani početni podaci odnose se na mesečno kretanje cena izabranih akcija. Za potrebe tržišnog kretanja prinosa korišćena je analiza bazirana na kretanju berzanskih indeksa SASX-30 i BIRS-a. Kao kriterij za izbor šireg pregleda literature uzet je stepen privrednog razvoja posmatranih zemalja koje se nalaze na sličnom stepenu privrednog razvoja, kao i Bosna i Hercegovina. Dakle, prikazani su rezultati istraživanja odabranih preduzeća iz posmatranih zemalja koje imaju sličnu stopu privrednog rasta kao BiH, a sve u cilju veće uporedivosti i komparativnosti uticaja ponderisane prosečne cene kapitala na indikatore profitabilnosti poslovanja. Berzanski indeks SASX – 30 je cenovni indeks (engl. price index), tj. isplaćene dividende indeksa se ne uzimaju u obzir prilikom kalkulacije indeksa. SASX -30 indeks ima za cilj da investitorima i analitičarima omogući ocenu generalnog kretanja na najlikvidnijem delu Sarajevske berze hartija od vrednosti. U sastav indeksa mogu biti uključeni samo simboli emitenata koji su uvršteni na Primarno slobodno tržište (PST).[2] Početna vrijednost indeksa SASX – 30 (engl. base value) iznosi 1.000 indeksnih poena, dok je početni datum indeksa (engl. base date) 31.03.2009. godine. Sastav indeksa SASX-30 na dan 01.03.2023. godine čine 30 kompanija sa sledećom strukturom:

[2] *Primarno slobodno tržište je subsegment Slobodnog tržišta Sarajevske berze hartija od vrednosti.*

Tabela 1: Kompozicija indeksa SASX-30

R.B.	Simbol	Emitent
1.	BHTSR	BH Telecom a.d. Sarajevo
2.	BORBRK3	Privredna banka Sarajevo a.d. Sarajevo
3.	BSNCR	Bosanac a.d. Orašje
4.	BSOSRK1	Adriatic osiguranje a.d.
5.	BSRSRK2	Bosna Reosiguranje a.d Sarajevo
6.	DCNSR	TP DC Sarajevo a.d. Sarajevo
7.	DCTKR	DC Tešanj Kraševo a.d.
8.	ENISR	Energoinvest a.d. Sarajevo
9.	FDSSR	Badeco adria a.d. Sarajevo
10.	HRCAR	Hercegovina auto a.d. Mostar
11.	HTKMR	JP HT a.d. Mostar
12.	IGKCRK3	Igman a.d. Konjic
13.	IKBZRK2	ASA banka a.d. Sarajevo
14.	INGMRK2	Ingram a.d. Srebrenik
15.	ITRTRK1	Interšped a.d. Tuzla
16.	JPEMR	JP Elektroprivreda HZHB Mostar
17.	JPESR	JP Elektroprivreda BiH a.d. Sarajevo
18.	LSLBRK3	Lječilište Slana banja a.d.
19.	MGVSR	Magros veletrgovina a.d. Sarajevo
20.	RIBNR	Riba Neretva a.d.
21.	RMUBR	RMU Banovići a.d. Banovići
22.	RPRZRK2	RMK Promet a.d. Zenica
23.	RSTTR	Rudnik Soli Tuzla a.d. Tuzla
24.	SOSOR	Sarajevo osiguranje a.d. Sarajevo
25.	STFJR	Štamparija Fojnica a.d. Fojnica
26.	TBOTRK1	Trgovina Borac a.d. Travnik
27.	TCMKR	Tvornica cementa Kakanj a.d. Kakanj
28.	TRGCR	Trgocoop a.d. Ljubuški
29.	ZGPSR	GP ŽGP a.d. Sarajevo
30.	ZVDPR	Zavod za vodoprivredu a.d.

Izvor: Sarajevska berza vrijednosnih papira (www.sase.ba)

Berzanski indeks Republike Srpske – BIRS uključuje najkvalitetnije akcije preduzeća i banaka. Formiran je 1. maja 2004. godine. Broj akcija koje ulaze u sastav BIRS–a može varirati od 5 do 15, zavisno o ispunjavanju kriterija za uključivanje akcija u BIRS indeks. Broj emitenata čije akcije ulaze u sastav BIRS–a zavisi od broja emitenata na službenom berzanskom tržištu i broja emitenata koji ispunjavaju uslove za sastav BIRS–a. U sastav BIRS–a mogu da uđu akcije emitenata koji ispunjavaju opšte uslove i kriterijume za uključivanje akcija u BIRS, izuzev akcija investicionih fondova. Sastav indeksa BIRS na dan. 01.03.2023. godine čine 12 kompanija sa sledećom strukturom:

Tabela 2: Kompozicija indeksa BIRS

R.B.	Simbol	Emitent
1.	ALPR-R-A	Alpro a.d. Vlasenica
2.	BOKS-R-A	Boksit a.d. Milići
3.	BVRU-R-A	ZTC Banja Vrućica a.d. Teslić
4.	DEST-R-A	Hemijska industrija destilacija a.d. Teslić
5.	EKBL-R-A	Elektrokrajina a.d. Banjaluka
6.	ELDO-R-A	Elekto Doboj a.d. Doboj
7.	HEDR-R-A	Hidroelektrane na Drini a.d Višegrad
8.	HELV-R-A	Hidroelektrane na Vrbasu a.d. Mrkonjić Grad
9.	HETR-R-A	Hidroelektrane na Trebišnjici a.d. Trebinje
10.	RITE-R-A	RITE Gacko a.d. Gacko
11.	RTEU-R-A	RITE Ugljevik a.d. Ugljevik
12.	TLKM-R-A	Telekom Srpske a.d. Banjaluka

Izvor: Banjalučka berza hartija od vrednosti (www.blberza.com)

Rezultati i diskusija

Tabela u nastavku teksta ilustruje dobijene rezultate ostvarenih mesečnih stopa prinosa odabranih akcija i berzanskih indeksa SASX-30 i BIRS za period: 03.01.2018. – 31.12.2021. godine.

Tabela 3: Deskriptivna statistika prosečnih (mesečnih) prinosa i viših momenata razdiobe oko sredine odabranih akcija u sastavu berzanskih indeksa SASX-30 i BIRS za period: 03.01.2018. – 31.12.2021. god.

TIK	Prosečan prinos	Standardna devijacija	Mera asimetrije	Spljoštenost	Min	Max
BHTSR	0,01	1,86	27,48	0,62	8,22	14,20
JPESR	0,08	2,86	23,54	1,00	7,20	17,81
SOSOR	0,15	2,97	27,59	1,24	4,85	16,01
TCMKR	0,04	0,97	77,94	3,73	22,50	32,90
SASX-30	0,06	0,45	60,10	4,35	961,32	1,778,08
TLKM-R-A	0,04	1,53	60,67	0,41	0,77	1,42
BVRU-R-A	0,06	1,91	71,46	3,00	0,57	1,45
BOKS-R-A	0,03	0,79	203,19	-12,52	0,45	0,71
HETR-R-A	0,06	3,08	25,13	0,42	0,16	0,43
BIRS	0,02	0,89	10,10	-0,36	488,0	733,54

Izvor: Proračun autora na osnovu podataka sa Sarajevske i Banjalučke berze hartija od vrednosti

Upoređujući dobijene prosečne stope prinosa odabranih preduzeća u sastavu berzanskih indeksa SASX-30 i BIRS u posmatranom periodu primetno je vrlo malo odstupanje od vrednosti nula, što je u skladu sa teorijskom pretpostavkom mnogih pristupa i modela za merenje tržišnih rizika, koji sadrže premisu da je dugoročni prosečni dnevni prinos jednak nuli. Najveća prosečna stopa prinosa je zabeležena kod sledećih akcija posmatranih preduzeća: Sarajevo osiguranje a.d. Sarajevo (0,15%), zatim JP Elektroprivreda BiH a.d. Sarajevo (0,08) i ZTC Banja Vrućica a.d. Teslić (0,06). Dakle, ovo su jako niske stope prinosa koje su karakteristične za rubno tržište kapitala, zatim tržište jako niske likvidnosti, isprekidanog trgovanja, odnosno veliki broj dana bez trgovanja što je posebno izraženo na tržištu kapitala Federacije Bosne i Hercegovine. Takođe, uticaj globalne krize izazvane COVID-19 je imalo uticaja na pad likvidnosti i nestabilnosti tražnje, te povlačenje, kako domaćih, tako i inostranih investitora. U kontekstu kretanja vrednosti viših momenata razdiobe oko sredine (mere asimetrije i spoljoštenosti) zabeležene su jako kolebljive i fluktuirajuće vrednosti. Najveće vrednosti mere asimetrije su ostvarene kod sledećih akcija preduzeća: BOKS-R-A (203,19), TCMKR (77,94), BVRU-R-A (71,46), TLKM-R-A (60,67). Ovi rezultati upućuju na zaključak da izabrane akcije odabrane skupine preduzeća imaju značajan asimetrični raspored prinosa. Za razliku od mere asimetrije, mera zaobljenosti tj. spljoštenost u posmatranom periodu vrednosti iznad 3 su ostvarene kod akcija preduzeća TCMKR (3,73) i kod berzanskog indeksa SASX-30 (4,35). Ovi rezultati upućuju na zaključak da distribucija prinosa akcija preduzeća TCMKR i berzanskog indeksa SASX-30 imaju veoma zaobljene „repove" (rubove) u odnosu na normalnu distribuciju. Visoka vrednost spljoštenosti ukazuje na češće pojavljivanje ekstremnih događaja, pozitivnih ili negativnih, nego što je to pretpostavljeno normalnom distribucijom.

Tabela 4: Kretanje β koeficijenta i korigovane β za akcije u sastavu berzanskih indeksa SASX-30 i BIRS za period: 03.01.2018. – 31.12.2021. godine

	BHTSR	JPESR	SOSOR	TCMKR	TLKM-R-A	BVRU-R-A	BOKS-R-A	HETR-R-A
β koeficijent	0,73	1,51	1,02	0,14	0,62	0,58	0,09	1,87
korigovana β	0,82	1,34	1,01	0,43	0,75	0,72	0,39	1,58

Izvor: Proračun autora

Na osnovu proračuna da se primetiti da samo tri akcije od ukupno osam akcija preduzeća imaju vrednost β veću od 1, dok ostale akcije pokazuju sporiju tendenciju promena u odnosu na tržišne promene, jer imaju vrednost bete manju od 1. Akcije kompanija koje imaju vrednost bete veću od 1 su sledeće: Hidroelektrane na Trebišnjici a.d. Trebinje (vrednost bete iznosi 1,87), JP Elektroprivreda BiH a.d. Sarajevo - JPESR (vrednost bete iznosi 1,51), zatim Sarajevo osiguranje a.d. Sarajevo (vrednost bete iznosi 1,02). Takođe, i standardna devijacija kao prva mera rizika za ove tri posmatrane akcije ima visoku vrednost, što prati vrednost bete iznad jedinice. Najnižu vrednost bete su ostvarile akcije preduzeća Boksit a.d. Milići (vrednost bete iznosi samo 0,09) što odgovara manjem sistematskom riziku i negativnoj prosečnoj stopi povrata (tabela 4).

Tabela 5 ilustruje dobijene rezultate troškova duga (proračunatih na osnovu formule 6), troškove akcijskog kapitala (proračunatih na osnovu formula 5 i 8) i WACC (proračunata na osnovu formule 3) odabrane skupine preduzeća. Samo jedno preduzeće iz uzorka (TLKM-R-A) ima značajan udeo duga u ukupnom kapitalu. Trošak duga posmatranih preduzeća iz uzorka je relativno mali i kreće se od minimalnih 0,02% (BVRU-R-A) do maksimalnih 8,49% (BOKS-R-A). Posmatrano sa druge strane, trošak kapitala za preduzeća iz uzorka kreće se od minimalnih 4,95% (akcije preduzeća BOKS-R-A) do maksimalnih 11,41% (akcije preduzeća HETR-R-A), dok se WACC kreće od minimalnih 5,11% (akcije preduzeća TCMKR) do maksimalnih 10,87% (akcije preduzeća HETR-R-A).

Tabela 5: Trošak duga, akcijskog kapitala i WACC za odabranu skupinu akcija u sastavu berzanskih indeksa SASX-30 i BIRS zaključno sa 31.12.2021. godine

	BHTSR	JPESR	SOSOR	TCMKR	TLKM-R-A	BVRU-R-A	BOKS-R-A	HETR-R-A
k_d(%)	1,83	0,54	1,77	2,04	2,91	0,02	8,49	0,77
beta	0,73	1,51	1,02	0,14	0,62	0,58	0,09	1,87
r_f (%)	0,0172	0,0172	0,0172	0,0172	0,0172	0,0172	0,0172	0,0172
RP(%)	4,72	4,72	4,72	4,72	4,72	4,72	4,72	4,72
CRP(%)	6,30	6,30	6,30	6,30	6,30	6,30	6,30	6,30
k_{ee}(%)	9,76	13,44	11,13	6,98	9,24	9,05	6,74	15,14
k_{es}(%)	7,29	10,11	8,33	5,14	6,88	6,73	4,95	11,41
E/(E+D)	0,92	0,92	0,98	0,99	0,63	0,92	0,82	0,95
D/(E+D)	0,08	0,08	0,02	0,01	0,37	0,08	0,18	0,05
WACC (%)	**6,83**	**9,34**	**8,19**	**5,11**	**5,30**	**6,19**	**5,43**	**10,87**

Izvor: Proračun autora

Iz prethodne tabele je evidentno da su najveće vrednosti prosečne ponderisane cene kapitala zabeležile sledeće akcije preduzeća: akcije preduzeća Hidroelektrane na Trebišnjici a.d. Trebinje - HETR-R-A (10,87%), zatim akcije preduzeća JP Elektroprivreda BiH a.d. Sarajevo – JPESR (9,34%) i akcije preduzeća Sarajevo osiguranje a.d. Sarajevo – SOSOR (8.19%). Dakle, sva tri posmatrana i analizirana preduzeća u sastavu berzanskih indeksa SASX-30 i BIRS su za posmatrani vremenski period imala vrednosti beta iznad jedinice, što navodi na zaključak da se njihove cene kreću u istom smeru kao i tržište (ali su neznatno volatilnije od tržišta), odnosno sa preuzimanjem većeg sistematskog rizika ostvaruju i pozitivne stope povrata. Ilustracije radi, preduzeće Hidroelektrane na Trebišnjici a.d. Trebinje je u 2021. godini ostvarilo neto dobit oko 3.06 miliona eura što predstavlja relativno povećanje za oko 3,878% u odnosu na prethodnu godinu. Takođe, i preduzeće JP Elektroprivreda BiH a.d. Sarajevo je u 2021. godini ostvarilo neto dobit u iznosu od oko 23,17 miliona eura, što predstavlja relativno povećanje za oko 194% u odnosu na prethodnu godinu. Preduzeće Sarajevo osiguranje a.d. Sarajevo je u 2021. godini ostvarilo neto dobit u iznosu od oko 781 hiljadu eura, što predstavlja relativno povećanje za oko 914% u odnosu na prethodnu godinu. Struktura kapitala posmatranih preduzeća izražena kroz WACC može biti kumulativni rezultat prethodnih pokušaja preduzeća, kao što je izdavanje akcija, ili bi mogla biti pod uticajem privremene fluktuacije u troškovima kapitala.

Tabela 6: Analiza kretanja vrednosti indikatora WACC, ROA, ROE i NPM odabrane skupine preduzeća zaključno sa 31.12.2021. godine (u%)

	WACC	ROA	ROE	NPM
BHTSR	6,83	2,17	6,37	11,82
JPESR	9,34	1,29	0,41	8,51
SOSOR	8,19	1,22	3,29	2,52
TCMKR	5,11	6,62	14,18	25,64
TLKM-R-A	5,30	5,79	10,85	17,33
BVRU-R-A	6,19	7,44	8,86	27,80
BOKS-R-A	5,43	0,14	0,23	0,31
HETR-R-A	10,87	0,60	0,65	10,44

Izvor: Proračun autora

Iz tabele se može zaključiti da za određena preduzeća ne postoji direktna korelacija i povezanost između indikatora prosečno ponderisanog troška kapitala i indikatora profitabilnosti poslovanja preduzeća. Preduzeća kao što su TCMKR i TLKM-R-A imaju jako nisku vrednost prosečno ponderisanog troška kapitala, ali sa druge strane jako visoke vrednosti indikatora profitabilnosti. Izuzev datih preduzeća, preduzeće BOKS-R-A ima takođe nisku vrednost prosečno ponderisanog troška kapitala, ali isto tako i jako niske vrednosti indikatora profitabilnosti. Razloge za različito kretanje indikatora profitabilnosti pre svega treba tražiti u vrednosti osnovnog kapitala, zatim broju akcionara, stabilnosti poslovanja, grani delatnosti i drugim faktorima. Različite vrednosti prosečno ponderisanog troška kapitala su pre svega posledica i uticaj različitog kretanja vrednosti beta koeficijenta i uticaja sistematskog rizika. Određena preduzeća odabranog uzorka (BOKS-R-A, TCMKR i TLKM-R-A) imaju povećano učešće neto finansijskih rashoda u dugoročnim dugovima, što znači da koriste skupe izvore kapitala na način da ih uposle na profitabilan način.

Tabela 7: Pearsonov koeficijent korelacije između varijabli: ROA, ROE,NPM, WACC za odabranu skupinu preduzeća

		ROA	ROE	NPM	WACC
ROA	Pearson Correlation	1,000	0,887	0,930	- 0,576
	Sig (2-tailed)	-	0,03	0,01	0,01
ROE	Pearson Correlation	0,887	1,000	0,811	-0,666
	Sig (2-tailed)	0,03	-	0,01	0,03
NPM	Pearson Correlation	0,930	0,811	1,000	-0,358
	Sig (2-tailed)	0,01	0,01	-	0,03
WACC	Pearson Correlation	-0,576	-0,666	-0,358	1,000
	Sig (2-tailed)	0,01	0,03	0,03	-

Izvor: Proračun autora

Dobijeni rezultati korelacione analize iz prethodne tabele ukazuju da je prisutna negativno signifikantna korelacija između prosečno ponderisanog troška kapitala, sa jedne strane i svih indikatora profitabilnosti, s druge strane. Dobijeni rezultati se slažu da rezultatima Hussain i Islam (2012), Syed i ostalih (2012), kao i sa rezultatima Momčilović i ostali (2021).

Zaključak

Sa stanovišta investitora svi investitori žele da njihov kapital bude uložen u ono preduzeće u kojem mogu da imaju maksimalan prinos na svoja ulaganja, u protivnom se neće dugo zadržati u datom preduzeću. Dakle, preduzeće treba da održava svoj profit i da pokuša da ga poboljša. Ukoliko stopa prinosa nije veća od cene kapitala, onda preduzeće ne može da preživi i u tom slučaju će akcionari prodati svoje akcije i prebaciti se u drugo preduzeće u cilju dobijanja bolje koristi. Prema tome, preduzeće treba da kreira takvu strategiju u kontekstu da se njegove profitne marže mogu maksimizirati i da mogu dati beneficije svojim akcionarima u obliku dividendi u gotovini. Prosečna ponderisana cena kapitala je važna odrednica profitabilnosti poslovanja preduzeća. Investicione odluke preduzeća u velikoj meri zavise od troškova poslovanja. Dakle, vrlo je važno razumeti kako prosečno ponderisana cena kapitala utiče na profitabilnost poslovanja.

Ova studija je sprovedena da analizira i interpretira empirijske dokaze o uticaju troška kapitala i efektima učinka na profitabilnost. Dakle, ovo istraživanje je imalo za cilj da proračuna prosečni ponderisani trošak kapitala za odabranu skupinu preduzeća u sastavu berzanskih indeksa SASX-30 i BIRS sa najvećim prometom, te da nakon toga utvrdi da li postoji uzajamna uslovljenost i korelacija između odabranih indikatora profitabilnosti (ROA, ROE i NPM) i WACC. Prosečni ponderisani trošak kapitala u ovom istraživanju za odabranu skupinu preduzeća je iznosio oko 7,16%. Najveća vrednost WACC zabeležena je kod akcija preduzeća HETR-R-A (10,87%), dok je sa druge strane najniža vrednost ostvarena kod akcija preduzeća TCMKR (5,11%). Visina WACC direktno dolazi i zavisi od vrednosti troška kapitala, a indirektno zavisi od vrednosti beta koeficijenata. Takođe dobijeni rezultati pokazuju da između WACC, s jedne strane i ROA, ROE i NPM sa druge strane, postoji negativna korelacija. Ovo je pre svega rezultat činjenice da određena skupina preduzeća koriste skupe izvore kapitala, ali kapital upošljavaju profitabilno, te s tim u vezi imaju visok WACC i indikatore profitabilnosti.

U poređenju sa prethodnim studijama može se zaključiti da su dobijeni rezultati u kontekstu uticaja WACC na indikatore profitabilnosti za odabranu skupinu preduzeća u BiH identični rezultatima dobijenih u istraživanjima Hussain i Islam (2012), Sharma (2012), Hussain i Chakraborty (2010) i Tashfeen i Liton (2010). Ovo je pre svega rezultat istog stepena privrednog razvoja posmatranih zemalja i Bosne i Hercegovine. Takođe, veći broj zemalja iz relevantnog pregleda literature kao i Bosna i Hercegovina imaju visoku tržišnu riziko premiju, kao i riziko premiju zemlje.

Kako je uzorak istraživanja relativno mali ovo istraživanje bi trebalo dodatno proširiti, kako bi se dobila adekvatnija zaključna razmatranja. Takođe, prilikom izbora preduzeća treba imati u vidu sledeće faktore koji karakterišu rubno tržište kapitala u BiH: niska likvidnost, isprekidano trgovanje, niske stope prinosa, niska tržišna kapitalizacija, i drugi faktori. Dakle, prilikom uključivanja dodatnih preduzeća u analizu treba uzeti u obzir ona preduzeća koja imaju najveći promet i veći broj dana aktivnog trgovanja.

Nalazi ovog istraživanja dopunjuju i unapređuju postojeću literaturu u vezi sa efektom i uticajem troška kapitala na finansijski učinak preduzeća, i mogu poslužiti menadžerima posmatranih preduzeća da bolje planiraju profitabilnost svoga poslovanja u kontekstu korišćenja i uticaja troškova sopstvenog i pozajmljenog kapitala. Rezultati ove analize mogu se koristiti kao referenca za buduća istraživanja koja se odnose na slične teme istraživanja. Razmatranje drugih faktora profitabilnosti skupa sa WACC-om obezbediće prostor za razumevanje relativnog uticaja WACC na profitabilnost poslovanja.

Upravljanje finansijskom strukturom preduzeća svakako predstavlja kontinuirani posao koji zavisi od mnogobrojnih internih i eksternih faktora, tako da zaključke dobijene ovim istraživanjem ne treba shvatiti kao konačne. S tim u vezi, preporuka je ovog istraživanja da se data problematika konstantno istražuje kroz analizu većeg broja preduzeća, varijabli i dužeg vremenskog perioda.

Reference

1. Alihodžić, A. (2011). Portfolio analiza - teorijsko metodološki aspekti investiranja u vrijednosne papire. Univerzitet u Zenici - Ekonomski fakultet Zenica.
2. Alihodžić, A. (2013). Primjena CAPM modela u vrednovanju finansijske imovine na tržištu kapitala BiH, Ekonomske teme, Vol. 51(1), str. 139-154.

3. Bhargav, P. (2017). Association of Financial Leverage with Cost of Capital and Shareholder Value: An Empirical Study of BSE Sensex Companies, Nmims. Journal of Economics and Public Policy. Volume 2, Issue 1.
4. Bhatnagar, V.K., Kumari, M., Sharma, N. (2015). Impact of Capital Structure & Cost of Capital on Shareholders' Wealth Maximization - A Study of BSE Listed Companies in India, Chanakya International Journal of Business Research, Vol. 1(1), pp. 28-36.
5. Bhayani, S. (2009). Impact of Financial Leverage on Cost of Capital and Valuation of Firm: A Study of Indian Cement Industry. PARADIGM, Vol. XIII., Issue 2, pp.44-49.
6. Bodie, Z., Kane, A., Marcus, A.J. (2009). Osnovi investicija. DATA STATUS, Beograd.
7. Božović, M. (2021). Empirijski izazovi finansijske teorije. Centar za izdavačku delatnost Ekonomskog fakulteta u Beogradu. Beograd.
8. Chowdhury, A., Chowdhury, S.P. (2010). Impact of Capital Structure on Firm's Value: Evidence from Banladesh. Business and Economic Horizons, Vol.3., No.3., pp. 111-122.
9. Damodaran, A. (2002). Investment valuation: Tools and techniques for determining the value of any asset. New York: John Wiley and Sons, Inc.
10. Damodaran, A. (2009). Volatility Rules: Valuing Emerging Companies. Retrivered from https://pages.stern.nyu.edu/~adamodar/pdfiles/papers/emergmkts.pdf
11. Damodaran, A. (2015). Applied Corporate Finance (4th Ed.). Hoboken, NJ: John Wiley & Sons Inc.
12. Fama, E. F., French, K. R. (2002). Testing trade-off and pecking order prediction, about dividends and debt. Review of Financial Studies, 15(1), pp.1–33.
13. Frank, M. Z., Goyal, V. K. (2009). Capital structure decisions: Which factors are Reliability important? Financial Management, 38, pp. 1-38.
14. Gilchrist, S., Zakrajsek, E. (2007). "Investment and the cost of capital: New evidence from the corporate bond market". National Bureau of Economic Research Cambridge, Mass. USA. Working Paper No. 13174.
15. Gordon, M. (1962). The Investment, Financing, and Valuation of the Corporation. Homewood, III: Irwin, 1962.
16. Higgins, R.C. (2005). Analysis of Financial Management. 3rd Edition, McGraw-Hill Irwin.
17. Hussain, S. A. G., Islam, Z. (2012). Impact of WACC on Corporate Profitability: A case study of cement industry of Pakistan Journal of Risk and Diversification.
18. Hussain, T., Chakraborty, L. (2010). Is the cost of capital animportant determinant of market performance of private commercial banks in Bangladesh? In Proceedings of ASBBS, ASBBS Annual Conference: Las Vegas ,Vol. 17, No. 1, pp. 389-399.
19. Khadka, H. B.(2007). Leverage and the Cost of Capital: Some Tests Using Nepalese Data. Journal of Nepalese Business Studies, 3(1), pp. 85–91.
20. Kočović, J., Paunović, M., Jovanović, M. (2016). Determining the Discount Rate: The Case of Oil Industry in Serbia. Ekonomika preduzeća, 64 (5-6), pp. 371-381.
21. Koller, T., Goedhart, M., Wessels, D. (2010). Valuation Measuring and Managing the Value of Companies, fifth edition, John Wiley & Sons, Inc.
22. Komisija za hartije od vrijednosti Republike Srpske (2020). Izvještaj o stanju na tržištu hartija od vrijednosti za 2020. godinu. Dospuno na: https://www.secrs.gov.ba/Documents/Izvjestaji/a9ea9f9f-e960-41b4-b51f-f12207032022_sr-Latn-CS.pdf.
23. Lewis, E.E. (1973). Methods of Statistical Analysis in Economics and Business. Boston: Houghton Miflin Company.

24. Miglo, H. (2012). Corporate Finance: Basic Theory and Advances Topics. 11th Ed. Xlibris Corporation.
25. Momčilović, M., Begović, S.V., Jovin, S. (2021). Research of the relationship between the weighted average cost of capital and selected profitability ratios of companies in the Republic of Serbia. International Journal of Economic Practice and Policy, Vol. XVIII, Issue 2, pp. 141-155.
26. Momčilović, M., Vlaović Begović, S. (2020). The Relationship between Weighted Average Cost of Capital and Profitability of Companies in Serbia: Case Study. Economic development and competitivenes of European countries: Challenges of economic integration, pp. 98-102.
27. Parmjit, K., Neeti, K. (2019). Relationship of Cost of Capital, Cost of Equity Capital, Value of Firm & other Financial Variables: Panel Data & Simultaneous Equation Analysis of Indian Companies. Finance India. Vol. 33. No. 2., pp. 21-58.
28. Ragil, S., Solimon, H. (2014). The Influence of Company Size and Capital Structure towards Liqudity, Corporate Performance and Firm Value, for Large and Small Group Companies. European Journal of Business and Management, Vol. 6., No.18, pp. 148-156.
29. Rajan, R., Zingales, L. (1995). What do we know about capital structure - Some evidences from international data. Journal of Finance. No. 50, pp. 1421-1460.
30. Ross, A.A. (2007). Modern Financial Management. 7th Ed. McGrawHill Irwin.
31. Schmidlin, N. (2014). The Art of Company Valuation and Financial Statement Analysis. John Wiley & Sons Ltd.
32. Sharma, A. (2012). Cost of Capital and Profitability Analysis - A Case Study of Telecommunication Industry. Journal of Commerce and Accounting Research. Volume 1. Issue 4.
33. Simmons, S., Banu. (2016). "Cost of capital and US investment: Does financing matter after all?". The Quarterly Review of Economics and Finance, 60, pp. 86-93.
34. Singapurwoko, A., El-Wahid, M.S. (2011). The Impact of Financial Leverage to Profitability, Study of Non-Financial Companies Listed in Indonesia Stock Exchange. European Journal of Economics, Finance, and Administrative Sciences, No. 32, pp.136-148.
35. Syed, W.H., Ghayanfar, A., Zia, U.I. (2012). Impact of WACC on Corporate Profitability. Impact of Risk and Diversification, No. 4, pp.1-7.
36. Šoškić, I., Serdar, V. (1994). Uvod u statistiku, Školska knjiga, Zagreb.
37. Tashfeen, H., Liton, C. (2010). Is The Cost of Capital an Important Determinant of Market Performance of Private Commercial Banks in Bangladesh?", Proceedings of ASBBS, ASBBS Annual Conference: Las Vegas , Volume 17, Number 1, pp.389-399.
38. Učkar, D., Urti, J. (2015). Utjecaj finansijske strukture na profitabilnost hrvatskih preduzeća. Oeconomica Jadertina, Vol.5. No.2, pp. 13-25.
39. Vidučić, Lj. (2006). Finansijski menadžment, V. Izdanje. Zagreb: RriF Plus.
40. Vukičević, M., Gregurek, M., Odobašić, S., Grgić, J. (2010). Finansijski menadžment u MS Excelu. Golden marketing - Tehnička knjiga, Zagreb.

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COST OF CAPITAL – THE EFFECT TO THE FIRM VALUE AND PROFITABILITY OF COMPANIES: EVIDENCE OF A SELECTED GROUP OF COMPANIES ON THE SARAJEVO AND BANJA LUKA STOCK EXCHANGES

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Summary: The weighted average cost of capital is the rate that companies must pay to shareholders and creditors. Therefore, it is a risk-adjusted discount rate for the company's cash flows. The paper will calculate the weighted average cost of capital for a selected group of companies listed on the Sarajevo and Banja Luka Stock Exchanges, as well as profitability indicators such as: ROA, ROE and net profit margin. Therefore, the main goal of this paper is to investigate whether there is interdependence in the movement of the weighted average cost of capital and profitability indicators of the selected group of companies in the stock market indices SASX-30 and BIRS. The research results show that the WACC ranges from a minimum of 5.11% to a maximum of 10.87%. Likewise, the research results show that there is a negative connection and correlation between WACC on the one hand and a selected group of profitability indicators on the other hand.

Keywords: cost of equity, WACC, correlation, beta coefficient, ROA, ROE, net profit margin.

JEL classification: G10, G12, G23

Introduction

Finances are very important for the entire economic sector as well as for its participants, i.e., for the survival, growth and expansion of business, which are the three main goals of every organization. Financial performance is a measure of how well a company can use funds from its main activity. Financing is not free because it causes an opportunity cost for the investor, which is certainly the income they would have earned if they had invested in the next best alternative.

The most important method in communicating financial information about the financial position and financial success of the company is certainly financial reports. Therefore, if a company wants to raise funds in the international capital market or invest in a foreign country, investors or business owners should analyze financial information with the help of financial statements.

In this era of globalization and the competitive business world, financing decisions play a significant role in maintaining the profitability of a company. Although many financing theories have emerged over time, none of them can absolutely suggest the optimal level of capital structure. The choice of capital structure is one of the most important decisions for companies because it can affect the earnings of shareholders and the value of the company. In addition to financing with their own capital, companies are also financed by borrowing, that is, by borrowing financial resources, either from banks, individuals or other sources. The company pays interest on the borrowed amount, that is, it pays the price of their debt. The payment made by the company for interest serves to reduce the tax base because the interest is recognized as an expense. Greater reliance on debt financing could increase enterprise risk and ultimately the costs of a company bankruptcy. On the other hand, equity financing and debt avoidance could send the wrong signals to investors about the company's financial status, which could increase the possibility of a hostile takeover. Companies try to find an optimal capital structure that will minimize the total cost of capital.

WACC is used as a discount rate for projects undertaken by the company (Ross, 2007). Usually, a higher discount rate results in lower cash flows and this consequently results in lower cash flows, and ultimately implies a low net present value of the project. A project with a low net present value leads to a decline in the company's profitability (Miglo, 2012).

This research will deal with the calculation of the weighted average cost of capital that a company must pay to shareholders and creditors. The weighted average cost of capital is usually said to reflect the risk of future cash flows to creditors and shareholders. The given is acceptable because the cost of capital is derived from expected future payments to shareholders, then the cost of debt is derived from the rate demanded by the company creditors for the money they lend. In this regard, it can be said that the average weighted cost of capital is the weighted average of the riskiness of cash flows of shareholders and creditors (Vukičević et al. 2010). The research will also calculate business profitability indicators of a selected group of companies listed on the Sarajevo and Banja Luka Stock Exchanges. The statistical tool that will be used to find the impact of the cost of capital on the profitability of the company will be correlation analysis.

The paper is structured in five parts. The first part refers to introductory considerations with an emphasis on the description of the definition of weighted average cost of capital. The second part describes an overview of previous research in terms of the influence of the weighted average cost of capital on business profitability indicators. The third part describes the selected research methodology, with a special focus on the necessary formulas for calculating the weighted average cost of capital and profitability indicators. The fourth part refers to the data necessary for the analysis. The fifth part presents the obtained research results, as well as certain observations and recommendations.

Review of Relevant Literature

Capital structure is a way of financing company assets through a certain combination of equity, debt or hybrid securities. Therefore, the capital structure of a company is the composition of its liabilities (Khadka, 2007). According to the Modigliani-Miller theory, the value of the company is determined through profitability, regardless of the capital structure. There is no direct relationship between profitability and debt structure, as well as the company WACC (Higgins, 2005). According to a study conducted by Hussain and Chakraborty (2010) on the example of 24 commercial banks listed on the Dhaka Stock Exchange in Bangladesh in the period from January 2006 to December 2008., came to the conclusion that there is a strong negative correlation between the cost of capital and the returns of commercial banks.

Profitability has a significantly negative relationship with leverage and short-term financing when the source is only external financing and when dividends are fixed, so profitability changes negatively with the change in the level of leverage (Ryan and Zingales, 1995).

Chowdhury and Chowdhury (2010) attempted to explain the relationship between capital structure and firm value in Bangladesh, and found that an optimal balance of debt and equity can maximize shareholders wealth requirements. They also concluded that the cost of capital should be as low as possible because it negatively affects the choice of capital structure.

According to a study conducted by Tashfeen and Liton (2010), there is a strong negative correlation between the cost of capital of commercial banks and their returns. The analysis was conducted on 24 listed commercial banks in Dhaka, Bangladesh in the period from January 2006 to December 2008.

Momčilović and Vlahović Begović (2020) examined the relationship between the weighted average cost of capital and profitability ratios for four companies. The authors point out that although companies with the lowest WACC are expected to have the highest key profitability ratios, the research results show otherwise. Also, the authors point out that it makes sense to use expensive sources of capital as long as the capital is used in a profitable way.

Singapourwoko and El-Wahid (2011) conducted a study on 48 companies for the period from 2003 to 2008, listed on the Indonesian Stock Exchange and found a significant positive relationship between leverage and profitability. On the other hand, Ragil and Solimon (2014) found different results by conducting a study on 60 listed companies of the same stock exchange. They divided the sample into two clusters, namely 30 small companies and 30 large companies. The results showed a significant negative relationship for the lower cluster, and an insignificant relationship between leverage and company value for the upper cluster, i.e., large enterprises.

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Hussain and Islam (2012) found a negative correlation between return on equity and weighted average cost of capital. In their research, weighted average cost of capital in relation to risk premium model, Gordon model as well as Fama-French model was applied to the cement industry of Pakistan. The results of the research measured the balanced impact of the cost of capital on the return on capital in the cement industry, assuming that the level of managerial as well as operational competence in all companies operating in this industry still remains unchanged.

Sharma (2012) analyzed the cost of capital and profitability of the telecommunications sector. The author's goal was to analyze the relationship between the cost of capital and the profitability of the company. The author found that the high cost of capital negatively affects the profitable position of the company. Also, the author suggests that finance is an important aspect of any business, and that appropriate sources of financing are used to ensure that the cost of capital is under proper control. Certainly, the tools are calculations and formulas of the cost of capital.

Gilchrist and Zakrajsek (2007) examined in their study the relationship between investment and the cost of capital using the corporate bond market as evidence. They focused on variations in interest rates on investment spending and their effects on investment decisions. A regression model was applied, and it was concluded that an increase in the cost of capital by 1 percent leads to a decrease in investment of 50 to 70 points.

Frank and Goyal (2009) investigated the capital structure of US companies for the period from 1950 to 2003, and found consistency with the trade-off model. Therefore, American companies use quality external sources of financing for their operations, provided that the cost of capital is relatively low.

Bhayani (2009) analyzed the impact of financial leverage on the average cost of capital. He conducted the research on a selected sample of cement companies in India for the period from 2000 to 2008. He calculated financial leverage and weighted average cost of capital and compared them using coefficient of correlation and t-test analysis. He came to the conclusion that there is no leverage effect on the cost of capital in the cement industry in India. Also, he established a positive correlation between companies with high and low leverage in relation to the cost of capital.

Bhatnagar et al. (2015) investigated identifying the optimal capital structure and cost of capital. Therefore, they attempted to analyze the impact of capital structure and cost of capital on shareholder wealth maximization by studying the 12 companies with the highest net worth listed on the stock exchange. The tools they used for analysis are regression analysis, and the use of arithmetic formulas to calculate capital structure, shareholder wealth and cost of capital. The results of the study showed that there is linearity between the cost of capital and shareholder wealth maximization, while on the other hand there is no relationship or linearity between shareholder wealth maximization and capital structure. The authors suggest that when making a decision to maximize shareholder wealth, management must consider the long-term impact on the company, and must consider all those factors that are responsible for maximizing shareholder wealth.

Učkar and Urti (2015) conducted research on 24 companies listed on the Zagreb Stock Exchange as part of the CROBEX stock index, for the period from 2011 to 2013. With this research, the authors tried to prove the influence of the financial structure on the business result, that is, to what extent the capital structure affects the value of the company. They took the company's indebtedness, ROE and ROA as variables. The research results showed that there is no correct answer as to which theory determines the capital structure. On the other hand, it was determined that there is a negative relationship between capital structure and business excellence. Therefore, a negative correlation occurs when the share of indebtedness in the capital structure is large and thus affects the weakening of business excellence.

Simmons and Banu (2016) examined the role of cost of capital, leverage, dividends and Tobin's q in corporate investment decision making. They discovered the relationship between the given independent variables with investments by taking quarterly data from 1987 to 2013. The VAR methodology was used for the investigation, where they finally came to the conclusion that leverage has a positive effect on investments, while the cost of capital causes a significantly negative response to investments.

Bhargav (2017) aimed to analyze the effect of financial leverage on the cost of capital. He conducted research on a sample of 28 companies listed on the Bombay Stock Exchange for a period of three years, i.e., from 2013 to 2015, within the stock index Sensex. He calculated the debt-to-equity ratio and the interest coverage ratio, in order to analyze the relationship between financial leverage and the cost of capital. The study found that leverage and the cost of capital are negatively correlated because debt reduces the cost of capital and interest is tax deductible. Hence, it goes without saying that by increasing the debt in the capital structure, the company can reduce the cost of capital.

Parmjit and Neeti (2019) examined whether the cost of capital is a function of capital structure or remains constant. They tried to analyze the relationship between the cost of equity capital, the cost of capital, the value of the firm and other financial variables. The study was done on 500 Indian companies for the period from 2008 to 2010. They found that the cost of capital has an impact on various business decisions based on the nature of the activity that helps managers make financial decisions of the company to run the firm profitably. The authors suggest that when making decisions for financial variables, the various factors that contribute to strategic effectiveness should first consider the efficiency of the company.

Research Methodology

The capital market in Bosnia and Herzegovina belongs to the group of small frontier capital markets characterized by small market capitalization and liquidity, as well as relative openness and accessibility for foreign investors, but also possible greater economic and political instability, and potentially greater long-term return and low correlation with other capital markets (Republic of Srpska Securities Commission, 2020). Calculating the daily rate of return on smaller transition markets, such as the capital market in Bosnia and Herzegovina, is one of the problems, given that there is no single point of view regarding the price that should be applied for the calculation. In the case when the trading data within one day is not known, the arithmetic mean between the lowest and the highest price is most often used. In developed capital markets, the last traded price is generally applied. The last price of the stock is usually chosen to reduce the price mismatch within the daily trading. In the capital market in Bosnia and Herzegovina, taking the last price can give a distorted picture of the actual daily events.

Share prices on the B&H capital market fluctuate significantly during the day, where the last price represents only one of the given oscillations, and not a price correction as in developed capital markets. Another important reason for the unreality of applying the last price is the fact that the investors themselves manipulate, i.e., raise the closing price, given that the value of the portfolio based on margin loans is calculated according to the closing prices, so that raising the closing price avoids the obligation to transfer additional securities to the shareholders account the bank where the margin loan was raised. All in all, the weighted average price is the logical choice. Therefore, the average weighted price is obtained by adding the prices of individual transactions during the day and weighting them by the volume of an individual transaction, as follows (Alihodžić, 2011):

$$p = \sum \frac{P_i}{X_i} \tag{1}$$

$$X_i = \frac{q_i}{Q}, \quad i = 1, \dots, N$$

Where in:

p - average price of securities;
P_i - transaction price (i);
X_i - the ratio of the volume of transactions (i) to the total volume of trade throughout the day;
q_i - volume of transaction (i); and
Q - total trading volume throughout the day.

In the way described above, the most realistic average price at which trading can be done on a given day is obtained. This research is based on the rate of return of the most liquid shares traded on the Sarajevo and Banja Luka Stock Exchanges. Likewise, this research is based on daily rates of return in order to further reduce the problem of low liquidity. Due to the lack of data on dividend payments, dividends were not taken into account when calculating daily rates of return of selected company shares. The daily rate of return an individual share will be calculated as follows:

$$r_{i,t} = \left(\frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}\right) x\ 100 \tag{2}$$

Where in:
$r_{i,t}$ - daily stock return (i) for day t;
$P_{i,t}$ - share price (i) for day t; and
$P_{i,t-1}$ - share price (i) for day t-1.

The share prices of the selected companies were taken from the websites of the Sarajevo Stock Exchange (www.sase.ba) and the Banja Luka Stock Exchange (www.blberza.com) for the period from 01 January 2018 to 31 December 2021.

The Sarajevo Stock Exchange stock index - SASX-30 as well as the Banja Luka Stock Exchange stock index - BIRS were used as a benchmark for the market portfolio in this research. These indices were chosen because they are considered highly diversified and because they describe the state of the capital market in Bosnia and Herzegovina.

The risk premium for shares is generally defined as the average difference in the rate of return on shares compared to a low-risk alternative in the form of government bonds or treasury bills (Božović, 2021). For the market risk premium in this research, the capital risk premium in Germany of 4.72% is used, which is taken from Damodoran database (http://pages.stern.nyu.edu/~adamodar). The country risk premium in Bosnia and Herzegovina, which is 6.30%, was also taken from Damodaran database (http://pages.stern.nyu.edu/~adamodar).

In order to estimate the value of companies that use discounted cash flow, it is necessary to use the weighted average cost of capital (WACC) to forecast the free cash flow, which is the opportunity cost that investors face when investing their funds in one particular business instead of others with similar risk. The most important principle underlying the successful implementation of the cost of capital is consistency between the components of WACC and free cash flow. The weighted average cost of capital (WACC) combines the rates of return required by debt holders (k_d) and equity holders (k_e). For a company financed exclusively by debt and equity, the WACC is defined as follows (Koller et al., 2010):

$$WACC = \frac{D}{D+E} k_d (1 - T_m) + \frac{E}{D+E} k_e \quad (3)$$

where debt (D) and equity (E) are measured using market values. From the previous equation, it can be seen that the cost of debt is reduced by the marginal tax rate T_m . The reason for this is that the tax shield is excluded from free cash flow. Since the interest tax shield has value, it must be included in the assessment. The discounted cash flow method when valuing a company values the tax shield in such a way as to reduce the weighted average cost of capital.

In order to determine the weighted average cost of capital for a particular company, it is necessary to evaluate the three components of the WACC, namely: the cost of capital, the after-tax cost of debt and the target capital structure of the company. Given that none of the variables are directly observable, different models, assumptions and approximations are used to estimate each component. These models estimate the expected return on alternative investments with similar risk using market prices. This is why the term expected return is used interchangeably with cost of capital. As the cost of capital is also used to allocate capital within the firm, it can also be called the required return or rate of return.

There are several ways to calculate the cost of permanent capital. One way to calculate the cost of permanent capital is to use the Capital Asset Pricing Model (CAPM), i.e., to calculate the required rate of return. According to this model, the required rate of return is calculated based on the following equation (Vidučić, 2006):

$$k_s = R_f + (R_m - R_f)\beta_j \quad (4)$$

Where in:

R_f – risk-free rate of return;
R_m - rate of return on the market portfolio; and
β_j - a measure of systematic risk for a given company.

According to Damodaran recommendation, the cost of equity capital for emerging markets can be calculated using the following formula (Damodaran, 2015):

$$k_{eei} = r_f + \beta_i RP + CRP \quad (5)$$

Where in:

r_f – risk-free rate on assets;
β_i - beta coefficient of the selected group of companies;
RP - denotes the market risk premium; and
CRP - denotes the country risk premium for Bosnia and Herzegovina.

According to Damodaran, the risk premium of developing markets with the political risk of the countries of Eastern Europe and South America is estimated at 8.5% (Damodaran, 2002). As there are no official statistics for monitoring and calculating the risk-free rate of return in Bosnia and Herzegovina, in this research the weighted average interest rate on bonds of the Government of the Federation of B&H of 0.75%[1] and the average weighted interest rate on bonds of the Government of the Republic of Srpska of 2.70% were taken. Therefore, the average weighted interest rate in this research will be 1.72% (https://www.mft.gov.ba). We will calculate the costs of long-term debt for selected companies listed on the Sarajevo and Banja Luka Stock Exchanges based on data from the latest financial reports, using the following formula (Kočović et al. 2016):

$$k_{ds} = \frac{Neto\ finansijski\ rashodi}{Dugoročni\ dugovi} \quad (6)$$

The beta coefficient measures the intensity of changes in the return on a share according to changes in the return on the overall share market. Therefore, the beta coefficient explains how much the rate of return of the observed stock will change if the rate of return of the market portfolio changes by 1.

How is it for the market, i.e., for the market portfolio $\beta = 1$ if the company stock has $\beta > 1$, then it will increase the risk of the portfolio, on the other hand, if there is $\beta < 1$ then it will reduce the risk of the portfolio. It has been empirically confirmed that for beta coefficients there is a statistical phenomenon called regression towards the mean. This practically means that securities that have a high beta, i.e., $\beta > 1$ in one period, will in principle have a lower beta in the future. The following also applies, that securities with a low beta, i.e., $\beta < 1$ will have a higher beta in the future. In this research the beta will be adjusted to multiply the sample score by 2/3 and the value of 1.0 by 1/3 so the adjusted beta will be: $\left(Adjusted\ \beta = \frac{2}{3} * \beta_{historical}\right)$ (Bodie et al. 2009). In this research, we will calculate the beta coefficient using the following formula:

$$\beta_j = \frac{\sigma_j}{\sigma_M} \rho(r_j, r_M) \quad (7)$$

Where in:
σ_j - standard deviation of security j;
σ_M - standard deviation of the market; and
ρ - the coefficient of correlation.

[1] *The symbol of the issued bonds of the Government of the Federation of B&H is FBH60321 and the issue date is 30 June 2021., while the symbol of the issued bonds of the Government of the Republic of Srpska is RSBD-025 and the issue date is 24 March 2021.*

Given that the cost of capital uses the German risk-free rate as well as the capital risk premium given in euros, the cost of capital for the companies considered is estimated as follows (Damodaran, 2009):

$$k_{esi} = (1 + k_{eei}) \frac{(1+E(i_S))}{(1+E(i_e))} - 1 \quad (8)$$

Where in:

$E(i_S)$ – expected inflation in Bosnia and Herzegovina; and
$E(i_e)$ – expected inflation in the EU.

In order to analyze the obtained results in more detail in this research, in addition to the average rate of return and standard deviation of the selected group of companies, higher moments of the distribution around the middle will also be calculated and analyzed. The third moment around the mean or skewness describes the deviation of the value of a numerical variable from the arithmetic mean, in order to show the way the value of the variable is distributed around the mean (Lewis, 1973). Therefore, the skewness can be defined as the ratio of the third moment about the mean and the standard deviation to the third power. The skewness is calculated according to the following formula:

$$\propto_3 = \sum_{i=1}^{N} \left(\frac{X_i - u}{\sigma}\right)^3 \quad (9)$$

In the case of a normal distribution, the skewness is 0, that is, there is an equal probability of achieving a negative or positive return. The skewness usually ranges in the interval ±2, and when it comes to a highly asymmetric return distribution, it takes on even higher values. Roundness around the modal peak of the frequency distribution curve represents kurtosis, which is defined as the ratio of the fourth moment around the center and the standard deviation to the fourth power (Šoškić and Serdar, 1994). Kurtosis is used in finance to describe extreme events, that is, those events that fall into the very tail of the distribution. Kurtosis is expressed using the following formula:

$$\propto_4 = \sum_{i=1}^{N} \left(\frac{X_i - u}{\sigma}\right)^4 \quad (10)$$

In the case of a normal distribution, the kurtosis is 3.

A frequent cause of misunderstandings when assessing the kurtosis of a particular distribution using computer programs for its calculation is that in most mathematical software packages, including Microsoft Excel, the amount of kurtosis is already reduced by 3 a priori. As the return-on-investment measure is used in a wide variety of forms with other performance indicators such as net profit, it is again more explicitly stated here in the variation of return on assets (ROA). Therefore, the return on assets takes into account the company net profit as well as interest costs and relates them to the average total assets of the balance sheet (Schmidlin, 2014):

$$Povrat\ na\ aktivu = \frac{Neto\ profit + troškovi\ kamata}{Ukupan\ bilans\ stanja} \quad (11)$$

Return on equity (ROE) shows the return on equity provided by shareholders. To calculate this important ratio, net profit is set against the average shareholders' equity during the business year. In the calculation, it is important to enter the net profit and shareholders' equity after deducting the minority interests in order to take into account only the figures to which the shareholders are actually entitled.

$$Povrat\ na\ kapital = \frac{Neto\ profit}{Akcionarski\ kapital} \tag{12}$$

This ratio gives investors an amount that can be compared between different companies and investment opportunities. A low return on equity indicates an inefficient use of capital or an overvaluation of its assets (and therefore shareholders' equity). Because of its connection between net profit and shareholders' equity, return on equity constitutes the central coefficient of profitability for shareholders. Net profit margin shows how many cents of profit are made per dollar of sales. Companies with an excellent market position, strict cost control and a low level of debt especially show very high net profit margins. The net profit margin is expressed as follows:

$$Neto\ profitna\ marža = \frac{Neto\ profit}{Prodaja} \tag{13}$$

Market power and cost management have a significant impact on the amount of net profit margin. The more pronounced the possibility of adjusting prices and at the same time lower costs, the higher the profit margin. For this reason, monopolistic or oligopolistic firms usually show high net profit margins.

Data for Analysis

Descriptive statistics in this research cover the period from 03 January 2018 to 30 December 2021, which is a total of 1.011 days. The selection of company shares in this research was carried out in such a way that the most liquid shares with high turnover and market capitalization higher than the median market capitalization from different sectors of activity were selected. The analyzed initial data refers to the monthly movement of the prices of the selected shares. For the purposes of the market movement of returns, an analysis based on the movement of the SASX-30 and BIRS stock market indices was used. The level of economic development of the observed countries, which are at a similar level of economic development as Bosnia and Herzegovina, was taken as a criterion for the selection of a wider literature review. Therefore, the results of the research of selected companies from the observed countries that have a similar rate of economic growth as B&H are presented, all with the aim of greater comparability and comparability of the impact of the weighted average cost of capital on business profitability indicators. The stock exchange index SASX - 30 is a price index, i.e., index dividends paid are not taken into account when calculating the index. The SASX -30 index aims to enable investors and analysts to assess the general trend on the most liquid part of the Sarajevo Stock Exchange. Only symbols of issuers listed on the Primary Free Market (PFM)[2]can be included in the composition of the index. The initial value of the index SASX - 30 (base value) is 1.000 index points, while the initial date of the index (base date) is 31.03.2009. Composition of the SASX-30 index as of 1 March 2023 consists of 30 companies with the following structure:

[2] *The primary free market is a sub-segment of the Free Market of the Sarajevo Stock Exchange.*

Table 1: Composition of the SASX-30 Index

No.	Symbol	Issuer
1.	BHTSR	BH Telecom a.d. Sarajevo
2.	BORBRK3	Privredna banka Sarajevo a.d. Sarajevo
3.	BSNCR	Bosanac a.d. Orašje
4.	BSOSRK1	Adriatic osiguranje a.d.
5.	BSRSRK2	Bosna Reosiguranje a.d Sarajevo
6.	DCNSR	TP DC Sarajevo a.d. Sarajevo
7.	DCTKR	DC Tešanj Kraševo a.d.
8.	ENISR	Energoinvest a.d. Sarajevo
9.	FDSSR	Badeco adria a.d. Sarajevo
10.	HRCAR	Hercegovina auto a.d. Mostar
11.	HTKMR	JP HT a.d. Mostar
12.	IGKCRK3	Igman a.d. Konjic
13.	IKBZRK2	ASA banka a.d. Sarajevo
14.	INGMRK2	Ingram a.d. Srebrenik
15.	ITRTRK1	Interšped a.d. Tuzla
16.	JPEMR	JP Elektroprivreda HZHB Mostar
17.	JPESR	JP Elektroprivreda BiH a.d. Sarajevo
18.	LSLBRK3	Lječilište Slana banja a.d.
19.	MGVSR	Magros veletrgovina a.d. Sarajevo
20.	RIBNR	Riba Neretva a.d.
21.	RMUBR	RMU Banovići a.d. Banovići
22.	RPRZRK2RMK	Promet a.d. Zenica
23.	RSTTR	Rudnik Soli Tuzla a.d. Tuzla
24.	SOSOR	Sarajevo osiguranje a.d. Sarajevo
25.	STFJR	Štamparija Fojnica a.d. Fojnica
26.	TBOTRK1	Trgovina Borac a.d. Travnik
27.	TCMKR	Tvornica cementa Kakanj a.d. Kakanj
28.	TRGCR	Trgocoop a.d. Ljubuški
29.	ZGPSR	GP ŽGP a.d. Sarajevo
30.	ZVDPR	Zavod za vodoprivredu a.d.

Source: The Sarajevo Stock Exchange (www.sase.ba)

The stock market index of Republika Srpska - BIRS includes the highest quality shares of companies and banks. It was formed on 1 May 2004. The number of shares included in BIRS can vary from 5 to 15, depending on the fulfillment of the criteria for including shares in the BIRS index. The number of issuers whose shares are included in BIRS depends on the number of issuers on the official stock market and the number of issuers that meet the requirements for BIRS membership. Shares of issuers that meet the general conditions and criteria for inclusion of shares in BIRS can be included in BIRS, with the exception of shares of investment funds. Composition of the BIRS index as of 01 March 2023 consists of 12 companies with the following structure:

Table 2: Composition of the BIRS Index

No.	Symbol	Issuer
1.	ALPR-R-A	Alpro a.d. Vlasenica
2.	BOKS-R-A	Boksit a.d. Milići
3.	BVRU-R-A	ZTC Banja Vrućica a.d. Teslić
4.	DEST-R-A	Hemijska industrija destilacija a.d. Teslić
5.	EKBL-R-A	Elektrokrajina a.d. Banjaluka
6.	ELDO-R-A	Elekto Doboj a.d. Doboj
7.	HEDR-R-A	Hidroelektrane na Drini a.d Višegrad
8.	HELV-R-A	Hidroelektrane na Vrbasu a.d. Mrkonjić Grad
9.	HETR-R-A	Hidroelektrane na Trebišnjici a.d. Trebinje
10.	RITE-R-A	RITE Gacko a.d. Gacko
11.	RTEU-R-A	RITE Ugljevik a.d. Ugljevik
12.	TLKM-R-A	Telekom Srpske a.d. Banjaluka

Source: Banja Luka Stock Exchange (www.blberza.com)

Results and discussion

The table below illustrates the obtained results of the realized monthly rates of return of selected shares and stock market indices SASX-30 and BIRS for the period: 03 January 2018. – 31 December 2021.

Table 3: Descriptive Statistics of Average (Monthly) Returns and Higher Moments of Distribution Around the Middle of the Selected Shares in the Stock Market Indices SASX-30 and BIRS for the Period: 03 January 2018 – 31 December 2021

TIK	Average re-turn	Standard devi-ation	Skewness	Kurtosis	Min	Max
BHTSR	0.01	1.86	27.48	0.62	8.22	14.20
JPESR	0.08	2.86	23.54	1.00	7.20	17.81
SOSOR	0.15	2.97	27.59	1.24	4.85	16.01
TCMKR	0.04	0.97	77.94	3.73	22.50	32.90
SASX-30	0.06	0.45	60.10	4.35	961.32	1.778.08
TLKM-R-A	0.04	1.53	60.67	0.41	0.77	1.42
BVRU-R-A	0.06	1.91	71.46	3.00	0.57	1.45
BOKS-R-A	0.03	0.79	203.19	-12.52	0.45	0.71
HETR-R-A	0.06	3.08	25.13	0.42	0.16	0.43
BIRS	0.02	0.89	10.10	-0.36	488.0	733.54

Source: Calculation by the author based on data from the Sarajevo and Banja Luka Stock Exchanges

Comparing the obtained average rates of return of selected companies in the composition of the SASX-30 and BIRS stock market indices in the observed period, a very small deviation from the value of zero is noticeable, which is in accordance with the theoretical assumption of many approaches and models for measuring market risks, which contain the premise that long-term average daily return equal to zero. The highest average rate of return was recorded for the following shares of the observed companies: Sarajevo osiguranje (0.15%), followed by JP Elektroprivreda B&H (0.08) and ZTC Banja Vrućica (0.06). Therefore, these are very low rates of return that are characteristic of the frontier capital market, then a market of very low liquidity, intermittent trading, i.e. a large number of days without trading, which is especially pronounced in the capital market of the Federation of Bosnia and Herzegovina. Also, the impact of the global crisis caused by COVID-19 had an impact on the drop in liquidity and instability of demand, and the withdrawal of both domestic and foreign investors. In terms of the movement of the values of the higher moments of the distribution around the center (skewness and kurtosis), very fluctuating values were recorded. The highest values of the skewness were achieved in the following company shares: BOKS-RA (203.19), TCMKR (77.94), BVRU-RA (71.46), TLKM-RA (60.67). These results point to the conclusion that the selected shares of the selected group of companies have a significant asymmetric distribution of returns. Unlike the skewness, the kurtosis in the observed period, values above 3 were realized in the shares of the company TCMKR (3.73) and in the stock index SASX-30 (4.35). These results point to the conclusion that the distribution of the returns of TCMKR shares and the stock index SASX-30 have very rounded „tails" (edges) compared to the normal distribution. A high value of kurtosis indicates a more frequent occurrence of extreme events, positive or negative, than assumed by a normal distribution.

Table 4: Movement of the β Coefficient and Corrected β for Shares in the Stock Market Indices SASX-30 and BIRS for the Period: 03 January 2018 – 31 December 2021

	BHTSR	JPESR	SOSOR	TCMKR	TLKM-R-A	BVRU-R-A	BOKS-R-A	HETR-R-A
β coefficient	0.73	1.51	1.02	0.14	0.62	0.58	0.09	1.87
corrected β	0.82	1.34	1.01	0.43	0.75	0.72	0.39	1.58

Source: Calculation by the author

Based on the calculation, it should be noted that only three shares out of a total of eight shares of the company β have a beta value greater than 1, while the other shares show a slower tendency to change in relation to market changes because they have a beta value less than 1. Shares of companies with a beta value greater than 1 are as follows: Hidroelektrane Trebišnjica – HETR-R-A (beta value is 1.87), JP Elektroprivreda BiH - JPESR (beta value is 1.51), then Sarajevo osiguranje - SOSOR (beta value is 1.02). Also, the standard deviation as the first measure of risk for these three observed shares has a high value, which follows a beta value above unity. The lowest beta value was achieved by the shares of the company Boksit Milići (beta value is only 0.09), which corresponds to a lower systematic risk and a negative average rate of return (table 4).

Table 5 illustrates the obtained results of debt costs (calculated on the basis of formula 6), costs of equity capital (calculated on the basis of formulas 5 and 8) and WACC (calculated on the basis of formula 3) of the selected group of companies. Only one company from the sample (TLKM-RA) has a significant share of debt in total capital. The cost of debt of the observed companies from the sample is relatively small and ranges from a minimum of 0.02% (BVRU-RA) to a maximum of 8.49% (BOKS-RA). On the other hand, the cost of capital for the companies in the sample ranges from a minimum of 4.95% (shares of BOKS-RA) to a maximum of 11.41% (shares of HETR-RA), while the WACC ranges from a minimum of 5.11% (shares of TCMKR) to maximum 10.87% (shares of HETR-RA company).

Table 5: Cost of Debt, Equity Capital and WACC for a Selected Group Of Shares in the SASX-30 and BIRS Stock Market Indices as of 31 December 2021

	BHTSR	JPESR	SOSOR	TCMKR	TLKM-R-A	BVRU-R-A	BOKS-R-A	HETR-R-A
k_d(%)	1.83	0.54	1.77	2.04	2.91	0.02	8.49	0.77
beta	0.73	1.51	1.02	0.14	0.62	0.58	0.09	1.87
r_f (%)	0.0172	0.0172	0.0172	0.0172	0.0172	0.0172	0.0172	0.0172
RP(%)	4.72	4.72	4.72	4.72	4.72	4.72	4.72	4.72
CRP(%)	6.30	6.30	6.30	6.30	6.30	6.30	6.30	6.30
k_{ee}(%)	9.76	13.44	11.13	6.98	9.24	9.05	6.74	15.14
k_{es}(%)	7.29	10.11	8.33	5.14	6.88	6.73	4.95	11.41
E/(E+D)	0.92	0.92	0.98	0.99	0.63	0.92	0.82	0.95
D/(E+D)	0.08	0.08	0.02	0.01	0.37	0.08	0.18	0.05
WACC (%)	**6.83**	**9.34**	**8.19**	**5.11**	**5.30**	**6.19**	**5.43**	**10.87**

Source: Calculation by the author

From the previous table, it is evident that the highest values of the weighted average cost of capital were recorded by the following company shares: shares of the company Hidroelektrana Trebišnjica - HETR-RA (10.87%), then shares of the company JP Elektroprivreda B&H - JPESR (9.34%) and shares the company Sarajevo osiguranje - SOSOR (8.19%). Therefore, all three observed and analyzed companies in the stock market indices SASX-30 and BIRS had beta values above unity for the observed time period, which leads to the conclusion that their prices move in the same direction as the market (but are slightly more volatile than the market), that is, with taking on a higher systematic risk, they also achieve positive rates of return. For example, the company Hidroelektrane Trebišnjica achieved a net profit of around 3.06 million euros in 2021, which represents a relative increase of around 3.878% compared to the previous year. Also, in 2021, JP Elektroprivreda B&H achieved net profit in the amount of about 23.17 million euros, which represents a relative increase of about 194% compared to the previous year. In 2021, the company Sarajevo osiguranje achieved a net profit in the amount of about 781 thousand euros, which represents a relative increase of about 914% compared to the previous year. The capital structure of the observed firms expressed through WACC may be the cumulative result of the firms' previous attempts, such as issuing shares, or it may be influenced by temporary fluctuations in the cost of capital.

Table 6: Analysis of Trends in the Values of the WACC, ROA, ROE and NPM Indicators of the Selected Group of Companies as of 31 December 2021 (in %)

	WACC	ROA	ROE	NPM
BHTSR	6.83	2.17	6.37	11.82
JPESR	9.34	1.29	0.41	8.51
SOSOR	8.19	1.22	3.29	2.52
TCMKR	5.11	6.62	14.18	25.64
TLKM-R-A	5.30	5.79	10.85	17.33
BVRU-R-A	6.19	7.44	8.86	27.80
BOKS-R-A	5.43	0.14	0.23	0.31
HETR-R-A	10.87	0.60	0.65	10.44

Source: Calculation by the author

From the table it can be concluded that for certain companies there is no direct correlation and connection between the indicator of the weighted average cost of capital and the indicator of the profitability of the company operations. Companies such as TCMKR and TLKM-RA have a very low value in terms of the weighted average cost of capital, but on the other hand very high values of the profitability indicator. Except for these companies, BOKS-RA also has a low value in terms of the weighted average cost of capital, but also very low values of profitability indicators. The reasons for the different movement of the profitability indicators should first of all be sought in the value of the basic capital, then the number of shareholders, the stability of the business, the branch of activity and other factors. The different values of the weighted average cost of capital are primarily the consequence and influence of the different movement of the value of the beta coefficient and the influence of systematic risk. Certain companies of the selected sample (BOKS-RA, TCMKR and TLKM-RA) have an increased share of net financial expenses in long-term debts, which means that they use expensive sources of capital in a way to employ them in a profitable way.

Table 7: Pearson Coefficient of Correlation Between Variables: ROA, ROE, NPM, WACCfor the Selected Group of Companies

		ROA	ROE	NPM	WACC
ROA	Pearson Correlation	1.000	0.887	0.930	- 0.576
	Sig (2-tailed)	-	0.03	0.01	0.01
ROE	Pearson Correlation	0.887	1,000	0.811	-0.666
	Sig (2-tailed)	0.03	-	0.01	0.03
NPM	Pearson Correlation	0.930	0.811	1.000	-0.358
	Sig (2-tailed)	0.01	0.01	-	0.03
WACC	Pearson Correlation	-0.576	-0.666	-0.358	1.000
	Sig (2-tailed)	0.01	0.03	0.03	-

Source: Calculation by the author

The obtained results of the correlation analysis from the previous table indicate that there is a negatively significant correlation between the weighted average cost of capital on the one hand and all profitability indicators on the other hand. The obtained results agree with the results of Hussain and Islam (2012), Syed et al. (2012), as well as with the results of Momčilović et al. (2021).

Conclusion

From the point of view of investors, all investors want their capital to be invested in the company where they can have the maximum return on their investment, otherwise they will not stay in the given company for long. Therefore, the company should maintain its profit and try to improve it. If the rate of return is not higher than the cost of capital, then the company cannot survive and in that case the shareholders will sell their shares and transfer to another company in order to get a better profit. Therefore, a company should create such a strategy so that its profit margins can be maximized and can give benefits to its shareholders in the form of cash dividends. The weighted average cost of capital is an important determinant of the profitability of a company's operations. Investment decisions of companies depend to a large extent on operating costs. Therefore, it is very important to understand how the weighted average cost of capital affects the profitability of the business.

This study was conducted to analyze and interpret empirical evidence on the impact of cost of capital and performance effects on profitability. Therefore, this research aimed to calculate the average weighted cost of capital for a selected group of companies in the stock market indices SASX-30 and BIRS with the highest turnover, and then to determine whether there is mutual conditioning and correlation between the selected indicators of profitability (ROA, ROE and NPM) and WACC. The average weighted cost of capital in this research for the selected group of companies was about 7.16%. The highest value of WACC was recorded for the shares of the company HETR-RA (10.87%), while on the other hand, the lowest value was achieved for the shares of the company TCMKR (5.11%). The height of the WACC directly comes from and depends on the value of the cost of capital, and indirectly depends on the value of the beta coefficients. The obtained results also show that there is a negative correlation between WACC on the one hand and ROA, ROE and NPM on the other hand. This is primarily the result of the fact that a certain group of companies use expensive sources of capital, but employ capital profitably, and in this connection have a high WACC and profitability indicators.

In comparison with previous studies, it can be concluded that the results obtained in terms of the influence of WACC on profitability indicators for a selected group of companies in Bosnia and Herzegovina are identical to the results obtained in the research of Hussain and Islam (2012), Sharma (2012), Hussain and Chakraborty (2010) and Tashfeen and Lytton (2010). This is primarily the result of the same degree of economic development of the observed countries and Bosnia and Herzegovina. Also, a large number of countries from the relevant literature review, as well as Bosnia and Herzegovina, have a high market risk premium, as well as the country risk premium.

As the research sample is relatively small, this research should be further expanded in order to obtain more adequate conclusions. Also, when choosing a company, you should keep in mind the following factors that characterize the frontier capital market in Bosnia and Herzegovina: low liquidity, intermittent trading, low rates of return, low market capitalization, and other factors. Therefore, when including additional companies in the analysis, should be taken into account those companies with the highest turnover and the largest number of active trading days.

The findings of this research supplement and improve the existing literature regarding the effect and influence of the cost of capital on the financial performance of the company, and can serve the managers of the observed companies to better plan the profitability of their business in terms of the use and influence of the costs of own and borrowed capital. The results of this analysis can be used as a reference for future research related to similar research topics. Consideration of other profitability factors together with WACC will provide space for understanding the relative impact of WACC on business profitability.

Management of the financial structure of the company certainly represents a continuous job that depends on numerous internal and external factors, so the conclusions obtained from this research should not be understood as final. In this regard, the recommendation of this research is that this issue is constantly investigated through the analysis of a larger number of companies, variables and a longer period of time.

References

1. Alihodžić, A. (2011). Portfolio analiza - teorijsko metodološki aspekti investiranja u vrijednosne papire. Univerzitet u Zenici - Ekonomski fakultet Zenica.
2. Alihodžić, A. (2013). Primjena CAPM modela u vrednovanju finansijske imovine na tržištu kapitala BiH, Ekonomske teme, Vol. 51(1), str. 139-154.
3. Bhargav, P. (2017). Association of Financial Leverage with Cost of Capital and Shareholder Value: An Empirical Study of BSE Sensex Companies, Nmims. Journal of Economics and Public Policy. Volume 2, Issue 1.
4. Bhatnagar, V.K., Kumari, M., Sharma, N. (2015). Impact of Capital Structure & Cost of Capital on Shareholders' Wealth Maximization - A Study of BSE Listed Companies in India, Chanakya International Journal of Business Research, Vol. 1(1), pp. 28-36.
5. Bhayani, S. (2009). Impact of Financial Leverage on Cost of Capital and Valuation of Firm: A Study of Indian Cement Industry. PARADIGM, Vol. XIII., Issue 2, pp.44-49.
6. Bodie, Z., Kane, A., Marcus, A.J. (2009). Osnovi investicija. DATA STATUS, Beograd.
7. Božović, M. (2021). Empirijski izazovi finansijske teorije. Centar za izdavačku delatnost Ekonomskog fakulteta u Beogradu. Beograd.
8. Chowdhury, A., Chowdhury, S.P. (2010). Impact of Capital Structure on Firm's Value: Evidence from Banladesh. Business and Economic Horizons, Vol.3., No.3., pp. 111-122.
9. Damodaran, A. (2002). Investment valuation: Tools and techniques for determining the value of any asset. New York: John Wiley and Sons, Inc.
10. Damodaran, A. (2009). Volatility Rules: Valuing Emerging Companies. Retrivered from https://pages.stern.nyu.edu/~adamodar/pdfiles/papers/emergmkts.pdf
11. Damodaran, A. (2015). Applied Corporate Finance (4th Ed.). Hoboken, NJ: John Wiley & Sons Inc.
12. Fama, E. F., French, K. R. (2002). Testing trade-off and pecking order prediction, about dividends and debt. Review of Financial Studies, 15(1), pp.1–33.
13. Frank, M. Z., Goyal, V. K. (2009). Capital structure decisions: Which factors are Reliability important? Financial Management, 38, pp. 1-38.
14. Gilchrist, S., Zakrajsek, E. (2007). "Investment and the cost of capital: New evidence from the corporate bond market". National Bureau of Economic Research Cambridge, Mass. USA. Working Paper No. 13174.
15. Gordon, M. (1962). The Investment, Financing, and Valuation of the Corporation. Homewood, III: Irwin, 1962.
16. Higgins, R.C. (2005). Analysis of Financial Management. 3rd Edition, McGraw-Hill Irwin.
17. Hussain, S. A. G., Islam, Z. (2012). Impact of WACC on Corporate Profitability: A case study of cement industry of Pakistan Journal of Risk and Diversification.
18. Hussain, T., Chakraborty, L. (2010). Is the cost of capital animportant determinant of market performance of private commercial banks in Bangladesh? In Proceedings of ASBBS, ASBBS Annual Conference: Las Vegas ,Vol. 17, No. 1, pp. 389-399.
19. Khadka, H. B.(2007). Leverage and the Cost of Capital: Some Tests Using Nepalese Data. Journal of Nepalese Business Studies, 3(1), pp. 85–91.
20. Kočović, J., Paunović, M., Jovanović, M. (2016). Determining the Discount Rate: The Case of Oil Industry in Serbia. Ekonomika preduzeća, 64 (5-6), pp. 371-381.

21. Koller, T., Goedhart, M., Wessels, D. (2010). Valuation Measuring and Managing the Value of Companies, fifth edition, John Wiley & Sons, Inc.
22. Komisija za hartije od vrijednosti Republike Srpske (2020). Izvještaj o stanju na tržištu hartija od vrijednosti za 2020. godinu. Dospuno na: https://www.secrs.gov.ba/Documents/Izvjestaji/a9ea9f9f-e960-41b4-b51f-f12207032022_sr-Latn-CS.pdf.
23. Lewis, E.E. (1973). Methods of Statistical Analysis in Economics and Business. Boston: Houghton Miflin Company. 24. Miglo, H. (2012). Corporate Finance: Basic Theory and Advances Topics. 11th Ed. Xlibris Corporation.
25. Momčilović, M., Begović, S.V., Jovin, S. (2021). Research of the relationship between the weighted average cost of capital and selected profitability ratios of companies in the Republic of Serbia. International Journal of Economic Practice and Policy, Vol. XVIII, Issue 2, pp. 141-155.
26. Momčilović, M., Vlaović Begović, S. (2020). The Relationship between Weighted Average Cost of Capital and Profitability of Companies in Serbia: Case Study. Economic development and competitivenes of European countries: Challenges of economic integration, pp. 98-102.
27. Parmjit, K., Neeti, K. (2019). Relationship of Cost of Capital, Cost of Equity Capital, Value of Firm & other Financial Variables: Panel Data & Simultaneous Equation Analysis of Indian Companies. Finance India. Vol. 33. No. 2., pp. 21-58.
28. Ragil, S., Solimon, H. (2014). The Influence of Company Size and Capital Structure towards Liqudity, Corporate Performance and Firm Value, for Large and Small Group Companies. European Journal of Business and Management, Vol. 6., No.18, pp. 148-156.
29. Rajan, R., Zingales, L. (1995). What do we know about capital structure - Some evidences from international data. Journal of Finance. No. 50, pp. 1421-1460.
30. Ross, A.A. (2007). Modern Financial Management. 7th Ed. McGrawHill Irwin.
31. Schmidlin, N. (2014). The Art of Company Valuation and Financial Statement Analysis. John Wiley & Sons Ltd.
32. Sharma, A. (2012). Cost of Capital and Profitability Analysis - A Case Study of Telecommunication Industry. Journal of Commerce and Accounting Research. Volume 1. Issue 4.
33. Simmons, S., Banu. (2016). "Cost of capital and US investment: Does financing matter after all?". The Quarterly Review of Economics and Finance, 60, pp. 86-93.
34. Singapurwoko, A., El-Wahid, M.S. (2011). The Impact of Financial Leverage to Profitability, Study of Non-Financial Companies Listed in Indonesia Stock Exchange. European Journal of Economics, Finance, and Administrative Sciences, No. 32, pp.136-148.
35. Syed, W.H., Ghayanfar, A., Zia, U.I. (2012). Impact of WACC on Corporate Profitability. Impact of Risk and Diversification, No. 4, pp.1-7.
36. Šoškić, I., Serdar, V. (1994). Uvod u statistiku, Školska knjiga, Zagreb.
37. Tashfeen, H., Liton, C. (2010). Is The Cost of Capital an Important Determinant of Market Performance of Private Commercial Banks in Bangladesh?", Proceedings of ASBBS, ASBBS Annual Conference: Las Vegas , Volume 17, Number 1, pp.389-399.
38. Učkar, D., Urti, J. (2015). Utjecaj finansijske strukture na profitabilnost hrvatskih preduzeća. Oeconomica Jadertina, Vol.5. No.2, pp. 13-25.
39. Vidučić, Lj. (2006). Finansijski menadžment, V. Izdanje. Zagreb: RriF Plus.
40. Vukičević, M., Gregurek, M., Odobašić, S., Grgić, J. (2010). Finansijski menadžment u MS Excelu. Golden marketing - Tehnička knjiga, Zagreb.