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CIKLUS MONETARNE POLITIKE U BOSNI I HERCEGOVINI

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Rezime: *S obzirom na to da Centralna banka BiH nema zakonsko ovlašćenje da kreditira rezidente, monetarni režim BiH je lišen referentne kamatne stope. Zbog toga smo ciklus monetarne politike u BiH aproksimirali odnosom između monetarnog agregata M2 i bruto domaćeg proizvoda. U radu smo dokazali visoku perzistentnost monetarnog ciklusa, potvrdili njegovu zavisnost od primarnog novca, te u analizu uključili i razliku između strane i domaće kamatne stope, kao i finansijski ciklus. Značajan dio monetarnih uslova kreiraju domaće banke, koje kroz depozitno-kreditnu multiplikaciju stvaraju sekundarne depozite, čime se potvrđuje endogena teorija novca. Na monetarni ciklus, očekivano, utiče i razlika između strane i domaće kamatne stope, pri čemu je ovaj odnos inverzan. Radi povećanja likvidnosti ekonomije, odnosno vrijednosti monetarnog ciklusa, preporučujemo primjenu politike monetarnog regulisanja. Ona bi obuhvatala ograničavanje izloženosti bh. banaka prema inostranstvu, uz istovremeno uvođenje negativne naknade na višak rezervi koje banke drže kod CBBiH.*

Ključne reči: bankarstvo, monetarni režim, endogena teorija novca, valutni odbor, ponuda novca, zona evra.

JEL klasifikacija: G21, G17, E50, E58, C30

Uvod

U jednom od prethodnih istraživanja (Jović, 2021) dokazali smo da se poslovni ciklus u zoni evra i u BiH razlikuju, osporavajući time višedecenijski stav da je valutni odbor, koji je uveden prvenstveno radi preuzimanja niske i/ili predvidive inflacije iz zone evra, prikladan monetarni režim za Bosnu i Hercegovinu. Logika valutnog odbora u kojem već treću deceniju funkcioniše bh. ekonomija je da ako se poslovni ciklusi u zemlji rezervne valute (zona evra) i u zemlji valutnog odbora (BiH) podudaraju nije potrebno voditi diskrecionu monetarnu politiku, a ako se dokaže suprotno, onda je diskreciona monetarna politika bolja opcija monetarnog režima od valutnog odbora. Opravdanost uvođenja režima valutnog odbora se izvodi i iz stepena integrisanosti bh. ekonomije u zonu evra.

Veza između strane i domaće ekonomije se može dokazivati i direktno upoređivanjem monetarnih ciklusa i određivanjem stepena međuzavisnosti stranog i bh. monetarnog ciklusa pri čemu se u obzir moraju uzeti i domaće monetarne i kreditne varijable. Jedna od varijabli za koju pretpostavljamo da bi, u skladu sa endogenom teorijom o novcu, trebala uticati na bh. monetarni ciklus je kreditna aktivnost bh. komercijalnih banaka. Naime, egzogena teorija kreiranja novca polazi od stava da se depoziti kreiraju pologom efektivnog novca u banku, tj. kreacijom primarnih depozita. Endogena teorija novca, koja je mnogo bliža stvarnom načinu kreiranja depozita, objašnjava da se odobravanjem kredita stvaraju sekundarni depoziti koji se dalje kroz proces odobravanja novih kredita umnožavaju i stvaraju nove depozite.

Ovim istraživanjem želimo da dokažemo da je uticaj monetarnog ciklusa u zoni evra na bh. monetarni ciklus relativno nizak u poređenju sa ostalim bh. determinantama monetarnog ciklusa. Monetarni ciklus smo definisali kao periodične fluktuacije u ponudi novca – monetarnih agregata M2 za BiH i M3 za zonu evra – a statistički monetarni ciklus smo odredili kao cikličnu komponentu filtriranu iz omjera monetarnog agregata i bruto domaćeg proizvoda. Uticaj primarnog novca (M0) na monetarni agregat M2 je nešto što se u uslovima valutnog odbora podrazumijeva, ali mi dokazujemo i uticaj kreditne aktivnosti bh. banaka i razlike u stranoj i domaćoj kamatnoj stopi (kamatna diferencija) na bh. monetarni ciklus tj. cikličnu komponentu monetarnog agregata M2. Zbog visoke likvidnosti banaka, koja se ogleda u visokoj stopi implicitne stope obavezne rezerve (odnos između ukupnih rezervi, koje uključuju obavezne rezerve i višak rezervi, i osnovice za obračun obaveznih rezervi) kreditnom dinamikom upravljaju banke, dok je druga najbitnija komponenta bh. monetarnog ciklusa kamatna diferencija pod kontrolom CBBiH. Naša hipoteza je da je uticaj ove dvije domaće komponente na bh. monetarni ciklus zbirno, a u jednom dijelu i pojedinačno, iznad uticaja monetarnog ciklusa u zoni evra.

U prvom dijelu istraživanje dajemo pregled literature koja se ovom temom bavila pretežno u drugim zemljama, s obzirom na neistraženost ove teme BiH i činjenicu da Centralna banka Bosne i Hercegovine (CBBiH) nema referentnu kamatnu stopu na kredite bh. bankama, jer joj nije dozvoljeno da pozajmljuje kredite bh. rezidentima. Navodimo i one izvore koji su pitanje diskrecione monetarne politike i valutnog odbora u BiH ispitivale i sa nekog drugog, ali sličnog, aspekta. U sljedećem dijelu predstavljamo metodološku osnovu istraživanja, a u narednom prikazujemo osnovne rezultate istraživanja, obrazlažemo ih i dovodimo u vezu sa postavljenim hipotezama istraživanja. U zaključku pored sumiranja glavnih nalaza istraživanja dajemo i preporuke za kreiranje ekonomske politike usmjerene na prevazilaženje negativne faze bh. monetarnog ciklusa.

Literarni pregled

Pod kontrakcijom u ciklusu monetarne politike se podrazumijeva rast kamatnih stopa i smanjenje ponude novca (eng. *monetary policy tightening*), a suprotno tome ekspanzija u ciklusu monetarne politike se svodi na smanjenje kamatnih stopa i povećanje ponude novca (eng. *monetary policy easing*). Neka od prvih istraživanja ciklusu u monetarnoj politici (SAD) su ga dovodila u vezu sa poslovnim ciklusom i ulogom novca u poslovnom ciklusu (Kydland , 1989). Po jednom od ovih istraživanja monetarnog ciklusa ponuda novca utiče na poslovni ciklus na tri načina – efekat prihoda, efekat blagostanja i efekat supstitucije – a stepen korelacije između promjena u ponudi novca i poslovnoj aktivnosti varira u zavisnosti od perioda (Davis, 1968). Kasnija istraživanja monetarnog ciklusa dovođena su u vezu sa finansijskim ciklusom, finansijskom stabilnošću i inflacijom, zadržavajući odnos sa poslovnim ciklusom. (Lane, 2024) daje pregled posljednjeg ciklusa kontrakcije monetarne politike ECB sa efektima na inflaciju, prinose i bankarski sektor, a isto to rade dva autora za SAD. Analizirajući lekcije iz prošlih epizoda monetarne ekspanzije (rasta u monetarnom ciklusu) autori (de Soyres & Saijid, 2024) zaključuju da FED nije bio efikasan u borbi protiv inflacije, te da je čest ishod restriktivnog monetarnog ciklusa bila recesija. Bosanskohercegovački autori (Mitrović & Erceg, 2018) ukazuju na ulogu CBBiH u određivanju likvidnosti bh. banaka, ali ne idu dalje od toga i ne istražuju monetarni ciklus, dok druga dva autora sagledavaju bh. monetarnu politiku sa aspekta makroekonomske stabilnosti (Nuhanović & Kešetović, 2009). Jedno istraživanje tretira bh. monetarnu politiku sa aspekta monetarne stabilnosti i ekonomskog razvoja (Marjanac , 2014) a drugo istraživanje (Tošković , 2018) sa aspekta kredibiliteta monetarne politike u režimu valutnog odbora. Naše prvo istraživanje na temu ciklusa u bh. ekonomiji (Jović, 2021) pokazalo je da se poslovni ciklus u BiH bitno razlikuje od poslovnog ciklusa u zoni evra, a ta pojava od bh. monetarne politike zahtjeva veći stepen samostalnosti u odnosu na monetarnu politiku ECB. Naime, da su se domaći i strani poslovni ciklus podudarili, to bi u režimu fiksnog deviznog kursa lišilo CBBiH bilo kakve potrebe za vođenjem samostalne monetarne politike, jer bi preuzimanje monetarne politike ECB, naravno pod pretpostavkom da je efikasna, bilo idealna opcija za bh. monetarnu politiku i ekonomiju. Drugo naše istraživanje na temu ciklusa u bh. ekonomiji ukazalo je na opadajući trend finansijskog ciklusa (deriviranog iz odnosa kredita i BDP), koji je uz to zadnjih nekoliko godina negativan, kao i na njegovo značajno odstupanje od finansijskog ciklusa u zoni evra (Jović & Vlašković , 2024). Postoje i istraživanja koja su dokazala uticaj instrumenata monetarne politike na pojedine intermedijarne varijable bh. monetarne politike (Jović, 2020). Grupa američkih autora je povezala monetarni, poslovni i finansijski ciklus te pokazala da kada u fazi monetarne restrikcije dođe do izravnjavanja ročnog spreda, neto kamatna margina se smanjuje, što smanjuje profitabilnost banaka i sklonost ka pozajmljivanju. (Pascal , 2018), dokazuje da ciklus monetarne politike ukoliko je suviše ekspanzivan ili naglo restriktivan povećava rizike po finansijsku stabilnost. U kontekstu monetarnog ciklusa i njegove veze sa globalnom finansijskom krizom (2007 - 2009) i dužničkom krizom ECB je objavila studiju (Giannone , Lenza , & Reichlin , 2019) u kojoj je pokazala da su dugoročne kamatne stope bile natprosiječno visoke, dugoročni krediti i depoziti izuzetno niski, dok ove dvije krize nisu uticale na kratkoročne kamatne stope, kao ni na kratkoročne kredite i depozite.

Materijal i metode

Glavna metodološka alatka istraživanja je višestruki regresioni model, s metodom najmanjih kvadrata koja je korištena za ocijenu parametara regresionog modela, a sve vremenske serije su na kvartalnom nivou. Najveći problem u ovom istraživanju je bio metodološke prirode – kako definisati ciklus monetarne politike, ili monetarni ciklus u valutnom odboru koji ne daje kredite rezidentima? Uobičajeno je da se ciklus monetarne politike posmatra kroz ciklus referentne kamatne stope centralne banke i u skladu sa

tim razmišljali smo da naknadi na višak rezervi (koje banke drže kod CBBiH) dodijelimo status referentne kamatne stope i da njene promjene uzmemo kao pokazatelj monetarnog ciklusa u BiH. Problem sa ovakvim pristupom je višestruk. Ta kamatna stopa nije kamatna stopa na kredite, već na višak rezervi, tj. višak depozita kod CBBiH, koje banke uvijek zbog odsustva kontrole kretanja kapitala mogu konvertovati u devize i tako prekinuti prenos efekata monetarne politike CBBiH. Dalje, bh. banke su izuzetno likvidne, neto kamatna margina je kao posljedica bankocentričnosti finansijskog sistema visoka, kao i provizije u neutralnim bankarskim poslovima (banke su jedini nosilac unutrašnjeg platnog prometa u BiH), oko 60% pasive banaka je nekamatonosno i zato je prenos promjena u naknadi na višak rezervi na aktivne i pasivne stope banaka nizak, skoro nepostojeći. Problem sa tretmanom drugog instrumenta monetarne politike, stope obavezne rezerve, je u tome što se ona vrlo rijetko mijenja – od jula 2016.godine do decembra 2024.godine stopa obavezne rezerve nije promijenjena, što je čini nepodesnom za ulogu pokazatelja ciklusa monetarne politike. Jedna od dobrih aproksimacija monetarnog ciklusa u valutnom odboru koji ne može davati kredite rezidentima (valutni odbori u Bugarskoj i Hong-Kongu se mogu izlagati prema domaćem tržištu), u nedostatku reprezentativne referentne kamatne stope, je ponuda novca tj. novčana masa posmatrana apsolutno, ili još bolje relativno u odnosu na privrednu aktivnost. Zbog svega prethodno navedenog ciklus monetarne politike (u istraživanju koristimo i alternativni, kraći, termin, monetarni ciklus) u Bosni i Hercegovini kao odnosa između monetarnog agregata M2 i nominalnog BDP, a alternativno on se može označiti i kao ciklus ponude novca. Radi analogije, a uvažavajući bitno drugačiju strukturu bilansa banaka zone evra iz čega je proizašao i drugačiji način mjerenja likvidnosti za određivanje monetarnog ciklusa u zoni evra je upotrebljen najširi monetarni agregat, M3, umjesto ciklusa referentne kamatne stope ECB. S obzirom da u BiH monetarni multiplikator već godinama ima približno istu vrijednost kao jednu od determinanti bh. monetarnog ciklusa smo uveli cikličnu komponentu primarnog novca (M0) koji u bh. valutnom odboru nije pod uticajem diskrecione politike centralne banke zbog zabrane kreiranja novca *ex nihilo*. Zbog intenzivne upotrebe Euribora u ugovaranju kredita sa promjenljivom kamatnom stopom u BiH, te kanala kamatnih stopa monetarne politike ECB, raspon (diferencija) između strane i domaće kamatne stope je određena kao razlika između dvanaestomjesečnog EURIBOR-a i naknade na sredstva iznad obavezne rezerve. Finansijski ciklus i za BiH i za zonu evra je dat u standardnoj formi kao odnos kredita banaka (krediti stanovništvu i krediti nefinansijskim privatnim sektorima) i nominalnog BDP. Ciklična komponenta je određena upotrebom Hodrick – Prescott filtera sa parametrom izravnavanja (lambda) od 400.000. U svim ciklusima BDP je određen kao pomična suma njegovih kvartalnih vrijednosti. Uveli smo jednu vještačku varijablu za četvrti kvartal 2008.godine, kada je kretanje M2 u BiH bilo pod jakim uticajem bankrota američke investicione banke Lehman Brothers (septembar 2008) i bankarske panike koju je ovaj bankrot izazvao na bh. bankarskom tržištu. Korištene su javno-dostupne baze podataka ECB, Eurostata, CBBiH i BHAS za period Q1 2006 – Q2 2024. Oznake varijabli, način njihovog izračunavanja i filtriranja ciklusa su kako slijedi.

Tabela 1 - Varijable u istraživanju

Varijabla	Oznaka	Izvor	Način izračunavanja	Metodologija filtriranja
Monetarni agregat M0 u BiH	M0	CBBH	-	-
Monetarni agregat M2 u BiH	M2	CBBH	-	-

Monetarni agregat M3 u zoni evra	M3	ECB	-	-
Monetarni ciklus u BiH	MC	Obrada autora	Ciklična komponenta M2/BDP	HP filter, lambda 400.000
Monetarni ciklus u zoni evra	MC_EUR	Obrada autora	Ciklična komponenta M3/BDP	HP filter, lambda 400.000
Finansijski ciklus u BiH	FC	Obrada autora	Ciklična komponenta krediti/BDP	HP filter, lambda 400.000
Ciklus primarnog novca u BiH	MC_PM	Obrada autora	Ciklična komponenta primarnog novac/BDP	HP filter, lambda 400.000
Kamatna diferencija	IRD	ECB i CBBiH	12-mjesečni Euribor minus naknada na višak rezervi CBBiH	-

Izvor: Autor

Rezultati i diskusija

Uzročno-posljedičnu vezu između varijabli smo kvantifikovali kroz višestruke regresione modele (Tabela 2). U svim jednačinama bh. monetarni ciklus ispoljava visoku perzistentnost mjerenu uticajem prethodne (prvi pomak – **lag**) na tekuću vrijednost ciklusa koja se kreće na nivou od oko 1. Uticaj drugog laga na monetarni ciklus je minus 0,4 tako da zbirni rast prve i druge autoregresione komponente bh. monetarnog ciklusa za 1 p.p povećava tekuću vrijednost monetarnog ciklusa za oko 0,6 p.p.

Tabela 2 - Pregled rezultata regresione analize, zavisno-promjenljiva bh. monetarni ciklus (MC), Q1 2006 – Q2 2024.

	EQ 1	EQ 2	EQ 3	EQ 4	EQ 5	EQ 6	EQ 7
Konstanta				**1,75** (4,7)***	**0,42** (1,7)*		
MC(-1)	**1,08** (10,1)***	**1,06** (9,9)***	**0,93** (8,3)***		**0,72** (11,2)***	**1,05** (9,7)***	**0,93** (7,8)***
MC(-2)	**-0,42** (-4,6)***	**-0,40** (-4,4)***	**-0,35** (-3,9)***			**-0,43** (-4,6)***	**-0,35** (-3,7)***
MC_PM	**0,31** (3,64)***	**0,30** (3,7)***	**0,35** (4,4)***			**0,26** (3,1)***	**0,32** (3,6)***

FC(-1)	**0,09** (3,7)***					**0,06** (2,4)**	**0,09** (3,0)***
FC		**0,09** (3,9)***	**0,10** (4,5)***				
IRD			**- 0,22** (2,7)***	**-1,5** (6,8)***	**-0,30** (1,8)*		**-0,22** (2,2)**
MC_EUR				**0,23** (3,7)***			
MC_EUR(3)					**0,09** (1,96)**	**0,06** (2,1)**	**0,05** (1,7)*
Dummy	**-4,19** (-4,4)***	**-4,13** (-4,3)***	**-3,62** (3,9)***			**-4,3** (-4,5)***	**-3,9** (4,1)***

Dijagnostika							
R^2	0,92	0,92	0,93	0,49	0,77	0,91	0,92
Durbin- Watson test	1,98	1,96	1,89	0,45	1,44	2,06	1,92
Jarque-Bera test	5,71 (0,057)	4 (1,13)	2,66 (0,26)	5,95 (0,05)	1.668 (0,000)	3,32 (0,16)	1,88 (0,38)

Napomena: *** signifikantno na nivou od 1%, ** signifikantno na nivou od 5%, * signifikantno na nivou od 10%

Izvor: Ibid

U svim jednačinama, očekivano, vrijednost koeficijenta uz cikličnu komponentu primarnog novca signifikantna je na nivou od 1 %. U prosjeku rast MC_PM za 1 p.p. povećava bh. monetarni ciklus za 0,3 p.p. što je očekivano visoka vrijednost koeficijenta s obzirom da u bh. monetarnom režimu nema emisije primarnog novca *ex nihilo*. Kreditna aktivnost banaka, predstavljena u obliku finansijskog ciklusa, djeluje na bh. monetarni ciklus odmah ili sa vremenskim pomakom, čime smo potvrdili tezu o endogenoj teoriji novca, po kojoj sama kreditna aktivnost autonomno stvara novac – povećava monetarni agregat M2. Prosječno rast finansijskog ciklusa za 1 p.p. utiče na rast bh. monetarnog ciklusa za 0,08 p.p. u odnosu na trendnu vrijednost.

Koeficijent uz kamatnu razliku (IRD) očekivano je negativan, a u dvije jednačine (EQ3 i EQ4) signifikantan je na nivou od 1%. U ekstremnom slučaju (EQ 4) rast IRD za 1 p.p. smanjuje vrijednost MC za 1,5 p.p., a u prosjeku, ako se ova ekstremna vrijednost isključi, uticaj IRD je 0,25 p.p.

Bez obzira na srednje jaku korelaciju domaćeg (MC) i stranog (MC_EUR) monetarnog ciklusa bilo nam je vrlo teško pronaći specifikaciju sa signifikantnim parametrom ispred MC_EUR. On je signifikantan na ni-

vou od 5% u četvrtoj jednačini, koja pored kamatne razlike (IRD) sadrži i konstantu. Monetarni impuls iz zone evra od 1 p.p., predstavljen kao ciklična komponenta odnosa monetarnog agregata M3 i BDP, povećava bh. monetarni ciklus za 0,09 p.p, ali ovaj monetarni impuls ne djeluje unaprijed, već retrospektivno (jednačina 5). U tri specifikacije uspostavljena je veza između tekućeg bh. monetarnog ciklusa i stranog monetarnog ciklusa, ali tek nakon tri kvartala (eng. lead), pa prema nije utvrđena hronološki očekivana reakcija domaćeg monetarnog ciklusa na promjene u stranom monetarnom ciklusu. U specifikacijama u kojima je izolovana jaka statistička veza između stranog monetarnog ciklusa i domaćeg monetarnog ciklusa koji reaguje na njegove promjene znak ispred ovoga parametra je negativan što protivrječi ekonomskoj logici veze ova dva ciklusa koji se uspostavlja sa monetarnim ciklusom u zemlji rezervne valute, a koja je pored toga u korelacionoj analizi pozitivna, a ne inverzna. Kako god bilo u regresionoj analizi smo uspostavili srednje jaku vezu između ovih monetarnih ciklusa, ali očekivanu uzročno-posljedičnu vezu u kojoj prethodne promjene stranog monetarnog ciklusa utiču na naredne promjene bh. monetarnog ciklusa smo utvrdili samo u jednoj od ukupno tri jednačine. Rast stranog monetarnog ciklusa odmah djeluje na rast bh. monetarnog ciklusa, ta veza je statistički signifikantna u omjeru 1 p.p. : 0,23 p.p. (četvrta jednačina).

Prema upotrebljenim pokazateljima dijagnostika modela je u prosjeku zadovoljavajuća. Stepen u kojem odabrane varijable objašnjavaju bh. monetarni ciklus, mjereno koeficijentom determinacije, vrlo je visok. Durbin-Watsonova statistika samo u dva slučaja odstupa bitno od dva, što je vrijednost koja ukazuje na nepostojanje pozitivne ili negativne autokorelacije reziduala. Osim kod pete jednačine raspored reziduala je normalan, sa *p* vrijednošću iznad 5% (ne može se odbaciti hipoteza da je raspored reziduala normalan).

I prostom korelacionom analizom pokazan je stepen zavisnosti bh. monetarnog ciklusa od domaćih i stranih monetarnih varijabli.

Tabela 3 - Matrica koeficijenata korelacije

	MC	MC_PM	FC	IRD	MC_EUR
MC	1,00	0,78	0,36	-0,71	0,54
MC_PM	0,78	1,00	-0,08	-0,32	0,48
FC	0,36	-0,08	1,00	-0,43	0,34
IRD	-0,71	-0,32	-0,43	1,00	-0,29
MC_EUR	0,54	0,48	0,34	-0,29	1,00

Izvor: Ibid.

U prvim godinama analiziranog perioda sve do kraja 2009. godine (Grafikon 1) odstupanja između monetarnog ciklusa i ciklusa primarnog novca su minimalna (razlika u prosjeku 0,4 p.p.). Značajna neusklađenost ovih ciklusa, iako je primarni novac u monetarnom odboru glavna determinanta monetarnog agregata M2, traje u manjoj ili većoj mjeri sve do kraja 2015. godine (razlika u prosjeku 1,8 p.p.). Ovaj period velikog odstupanja dva najznačajnija monetarna ciklusa se najvećim dijelom odnosi na produženo djelovanje svjetske ekonomske krize (2007 – 2009) i krizu javnog duga u zemljama zone evra. Do polovine 2020., prije nego što su efekti „zaključavanja" ekonomije pogodili BiH, održavana je visoka usklađenost monetarnog ciklusa i ciklusa primarnog novca (razlika u prosjeku 0,3 p.p.). Nakon toga potpuno razdvajanje ciklusa M2 i ciklusa M0 traje sve do kraja analiziranog perioda, likvidnost ekonomije, poslije izuzetno ekspanzivne monetarne politike ECB i najviših vrijednosti monetarnog

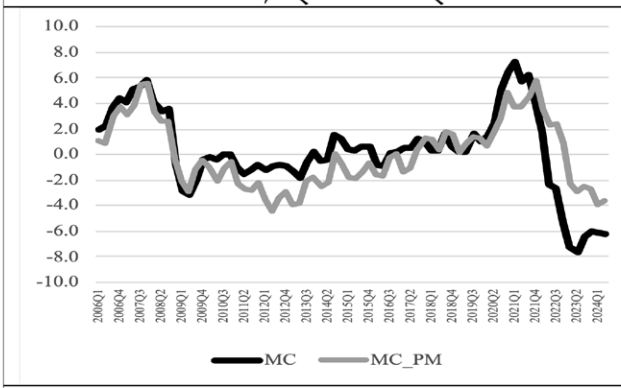
ciklusa, pada na istorijski najniži nivo (vrijednost monetarnog ciklusa je od trendne vrijednosti u Q2 2024. godine odstupila za 6,2%), a monetarni ciklus je prosječno za 2 p.p. niži od ciklusa primarnog novca. Za ovih, malo više od 8 godina (33 kvartala) koeficijent korelacije je 0,78 (Tabela 3), pa je prema tome 60% promjena u monetarnom ciklusu, determinisano promjenama u primarnom novcu.

Na početku i pri kraju posmatranog perioda uspostavljena je izuzetno jaka veza monetarnog agregata M2 i kredita banaka, odnosno monetarnog i finansijskog ciklusa (Grafikon 2). Između dva perioda jake pozitivne korelacije monetarni ciklus oscilira oko nule, a finansijski ciklus ima trend pada, koji je na kratko prekinut u razdoblju od polovine 2016. godine do polovine 2018. godine. Tokom 2024. godine negativne vrijednosti monetarnog i finansijskog ciklusa su skoro izjednačene. Korelacija između dva ključna bh. novčana ciklusa je duplo niža od jačine veze koja je identifikovana kod ciklusa primarnog novca, ali je pozitivna, ukazujući na depozitnu multiplikaciju i endogeno (unutrašnje) stvaranje novca od strane komercijalnih banaka.

Razlika u stranoj (12m Euribor) i bh. kamatnoj stopi (naknada na višak rezervi) i monetarni ciklus su inverzno korelisani, u apsolutnoj vrijednosti, skoro na nivou jačine veze između monetarnog ciklusa i ciklusa primarnog novca (Grafikon 3). Kamatna razlika određuje skoro ravno 50% varijabiliteta bh. monetarnog ciklusa. Od kad je postalo očigledno da će ECB promijeniti smjer monetarne politike i početi voditi restriktivnu monetarnu politiku, formira se izrazito jaka međuzavisnost između ovih varijabli, mjereno koeficijentom korelacije 0,95. Viša strana od domaće kamatne stope pokazatelj je većeg stepena restriktivnosti monetarne politike u zoni evra u poređenju sa bh. monetarnom politikom.

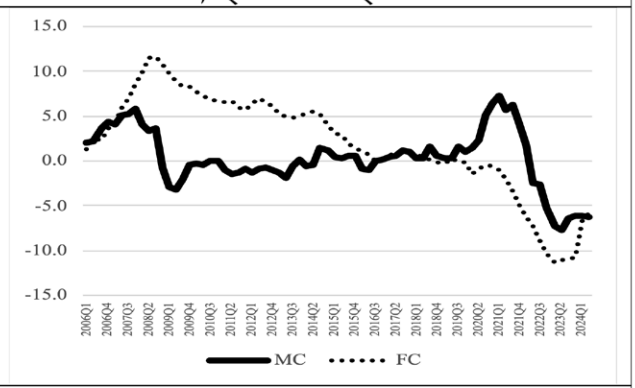
Uticaj monetarnog ciklusa u zoni evra na bh. monetarni ciklus (Grafikon 4) je umjerene jačine, sa povremenim odstupanjem domaćeg od stranog ciklusa (Q1 2010 – Q3 2017), njihove izražene podudarnosti (Q4 2017 – Q2 2022), viših vrijednosti domaćeg od stranog ciklusa (Q3 2020 - 2021 Q1) i na kraju (Q2 2022 – Q2 2024) jake direktne veze i značajno nižih vrijednosti domaćeg u odnosu na strani monetarni ciklus. U prosjeku, 30% varijabiliteta bh. monetarnog ciklusa je pod direktnim uticajem promjena u monetarnom agregatu M3 zone evra. Ovdje se mora primijetiti da je i u prvoj i u drugoj godini korone, sa izuzetkom četvrtog kvartala 2022. godine domaći monetarni ciklus ima veću vrijednost od stranog.

Grafikon 1. Monetarni ciklus i ciklus primarnog novca u BiH, Q1 2006 - Q2 2024.



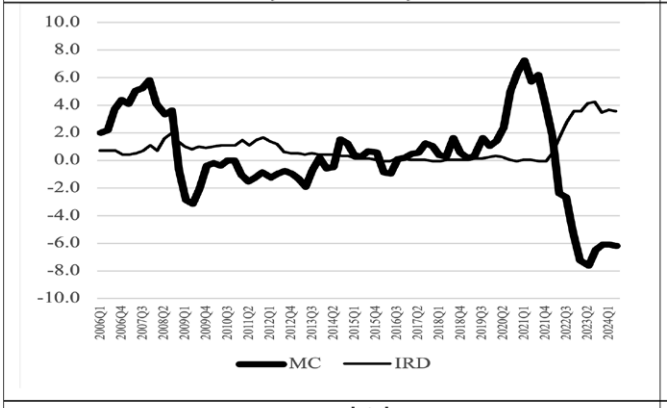
Izvor: Autor.

Grafikon 2. Monetarni ciklus i finansijski ciklus u BiH, Q1 2006 - Q2 2024.



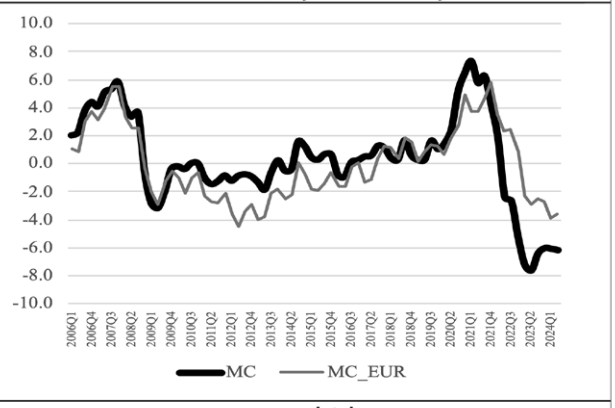
Izvor: Ibid.

Grafikon 3. Monetarni ciklus u BiH i kamatna razlika, Q1 2006 - Q2 2024.



Izvor: Ibid.

Grafikon 4. Monetarni ciklus u BiH i monetarni ciklus u zoni evra, Q1 2006 - Q2 2024.



Izvor: Ibid.

Dobijeni rezultati istraživanja su u skladu sa radnim hipotezama postavljenom na početku. Autoregresivna komponenta je izuzetno jaka, sa prvim autoregresivnim koeficijentom koji povećava i drugim koji smanjuje bh. monetarni ciklus. U prosjeku prethodne vrijednosti bh. monetarnog ciklusa povećavaju tekuće vrijednosti bh. monetarnog ciklusa za 0,6 p.p. Druga determinanta bh. monetarnog ciklusa je ciklus primarnog novca, što je i očekivano s obzirom da bh. bankarski sistem funkcioniše u režimu valutnog odbora. U prosjeku rast ciklusa primarnog novca za 1 p.p. povećava bh. monetarni ciklus za 0,3 p.p. Treća najvažnija komponenta bh. monetarnog ciklusa je razlika strane i domaće kamatne stope čiji koeficijenti variraju od 0,22 p.p. do 1,5 p.p. Pozitivna vrijednost ove razlike smanjuje, a negativna vrijednost povećava likvidnost bh. ekonomije mjerene monetarnim ciklusom na bazi M2.Koeficijent (parametar) uz finansijski ciklus, koji smo definisali kao cikličnu komponentu iz odnosa kredita i BDP, uzima prosječnu vrijednost od 0,095 p.p. za koliko se povećava bh. monetarni ciklus ako se odstupanje odnosa kredita i BDP u odnosu na trendnu vrijednost poveća za 1 p.p. Ovim je na primjeru bh. bankarskog sistema potvrđena endogena teorija novca koja se odnosi na važnu ulogu banaka u kreiranju depozita kroz proces depozitno-kreditne multiplikacije i stvaranja sekundarnih depozita. Bh. bankarski sistem endogeno, interno i samostalno kreira novac i time, pored Centralne banke Bosne i Hercegovine, istupa kao jedan od de facto kreatora monetarne politike.

Zaključna razmatranja i preporuke

Kao ni finansijski ni monetarni ciklus u BiH nisu bili predmet intenzivnog proučavanja, jer je glavni tok bh. ekonomske misli odabrao analizu varijabli u apsolutnim vrijednostima za predmet proučavanja. Dekompozicija varijabli i samostalna analiza ciklične komponente vremenske serije nije, u kontekstu analize jaza (eng. *gap analysis*) tj. odstupanja serije od njene trendirane vrijednosti, dugo vremena bila opšteprihvaćena kao metod statističke ili ekonometrijske analize.

Nakon što smo u prethodnim istraživanjima pokazali da se poslovni ciklus u BiH i zoni evra razlikuju, a dokazali smo i da se bh. finansijski ciklus nalazi u opadajućoj fazi, dokazivanje potrebe za većim stepenom diskrecije u vođenju monetarne politike u BiH nastavili smo konstrukcijom bh. monetarnog ciklusa i utvrđivanjem njegovih uzročno-posljedičnih veza sa ključnim monetarnim varijablama. Dokazali smo dominantan uticaj bh. varijabli na bh. monetarni ciklus, uz samo marginalni uticaj monetar-

nog ciklusa u zoni evra. Zajednički bh. finansijski ciklus, kao i razlika između strane i domaće kamatne stope, u većoj mjeri određuju bh. monetarni ciklus nego što to čini monetarni ciklus u zoni evra. Pojedinačno uzevši uticaj kamatne diferencije na bh. monetarni ciklus veći je od uticaja monetarnog ciklusa u zoni evra.

Koeficijenti ispred svih varijabli u svim jednačinama imaju očekivani znak, a najveću vrijednost imaju parametri ispred autoregresivne komponente i ciklusa bh. primarnog novca. Visoka perzistentnost bh. monetarnog ciklusa i uticaj monetarne baze na promjene monetarnog ciklusa u režimu valutnog odbora koji ne može odobravati kredite rezidentima su očekivane karakteristike monetarnog ciklusa koje omogućavaju njegovo predviđanje.

S druge strane stvaranje novca u bh. bankarskom sistemu odvija se endogeno kreditnom aktivno**šću** banaka, koje kroz depozitno-kreditnu multiplikaciju uvećavaju depozitni potencijal banaka.

Svi uključeni ciklusi tj. varijable , osim kamatne diferencije, imaju direktnu vezu sa bh. monetarnim ciklusom. Inverznu vezu monetarnog ciklusa sa kamatnom diferencijom, koja je predstavljena kao razlika između strane i domaće kamatne stope, treba tumačiti na način da će smanjenje strane kamatne stope (*ceteris paribus*) pozitivno uticati na naš monetarni ciklus jer to preokreće tokove novca i kapitala u korist Bosne i Hercegovine, povećavajući kreditni potencijal bh. banaka.

S druge strane smanjenje kamatne diferencije kroz rast bh. kamatne stope (naknade na višak rezervi banaka kod CBBiH) ne vodi ka pozitivnim promjenama u bh. finansijskom i monetarnom ciklusu jer to predstavlja restriktivnu monetarnu politiku. Zbog toga se monetarna politika usmjerena na povećanje kreditnog potencijala banaka i rasta likvidnosti bh. ekonomije treba zasnivati na ograničenju izloženosti bh. banaka prema inostranstvu (oročeni depoziti kod nerezidentnih banaka, krediti nerezidentima, hartije od vrijednosti izdate od strane nerezidenata) i negativnoj naknadi na višak rezervi. Prva mjera obezbjeđuje smanjenje deviznih potraživanja bh. banke tj. konverziju deviza u sredstva na računu rezervi banaka kod CBBiH, a druga mjera motiviše banka da radi smanjenja troškova (negativna naknada) povećaju kreditnu aktivnost i podignu vrijednosti finansijskog i monetarnog ciklusa.

Ovo istraživanje pruža detaljan uvid u determinante bh. monetarnog ciklusa, ali samo sa aspekta monetarne ekonomije i zato bi se buduća istraživanja monetarnog ciklusa trebala nastaviti u pravcu obogaćivanja jednačina monetarnog ciklusa sa objašnjavajućim varijablama iz realnog sektora, kao što je npr. bh. spoljnotrgovinski promet sa zonom evra. Drugi pravac analize monetarnih uslova može poći od činjenice da se monetarni uslovi mjere na četiri načina. Mjera monetarnih uslova su pored finansijskog i monetarnog ciklusa i indeks monetarnih uslova i ciklus kamatnih stopa, a posebno istraživanje ove posljednje mjere nedostaje monetarnom režimu Bosne i Hercegovine. Korisna istraživačka tema bi bio i monetarni ciklus u Bugarskoj, čija ekonomija takođe funkcioniše u režimu monetarnog odbora, ali uz pravo Narodne banke Bugarske da pozajmljuje novac bugarskim bankama.

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THE MONETARY POLICY CYCLE IN BOSNIA AND HERZEGOVINA

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Abstract: *Given that the Central Bank of Bosnia and Herzegovina does not have the legal authority to lend to residents, the country's monetary regime is deprived of a reference interest rate. Therefore, we approximated the monetary policy cycle in Bosnia and Herzegovina by using the ratio between the monetary aggregate M2 and gross domestic product. In this paper, we demonstrated the high persistence of the monetary cycle, confirmed its dependence on base money, and included in our analysis the interest rate differential between foreign and domestic rates, as well as the financial cycle. A significant portion of monetary conditions is shaped by domestic banks, which create secondary deposits through deposit-credit multiplication, thereby confirming the endogenous theory of money. As expected, the monetary cycle is also influenced by the interest rate differential, with this relationship being inverse. In order to increase the liquidity of the economy, that is, the value of the monetary cycle, we recommend implementing a policy of monetary regulation. This would include limiting the exposure of BH banks to foreign markets, while simultaneously introducing a negative fee on excess reserves held by banks at the Central Bank of Bosnia and Herzegovina.*

Keywords: banking; monetary regime; endogenous money theory; currency board; money supply; euro area.

JEL classification: G21, G17, E50, E58, C30

Introduction

In one of our previous studies (Jović, 2021), we demonstrated that the business cycles in the euro area and in Bosnia and Herzegovina differ, thereby challenging the decades-long belief that a currency board, which was introduced primarily to import the low and/or predictable inflation from the euro area, is a suitable monetary regime for Bosnia and Herzegovina. The logic behind the currency board, under which the BH economy has operated for nearly three decades, is that if the business cycles of the reserve currency country (the euro area) and the currency board country (BiH) are synchronized, there is no need to conduct discretionary monetary policy. However, if the opposite is proven, then discretionary monetary policy becomes a more appropriate monetary regime than the currency board. The justification for introducing the currency board regime is also derived from the degree of integration of the BiH economy into the euro area.

The connection between the foreign and domestic economies can also be examined by directly comparing their monetary cycles and determining the degree of interdependence between the foreign and BH monetary cycles, taking into account domestic monetary and credit variables. One such variable, which we assume, based on the endogenous theory of money, affects the BH monetary cycle is the lending activity of BH commercial banks. The exogenous theory of money creation holds that deposits are created by placing base money into banks, i.e., through the creation of primary deposits. The endogenous theory of money, which more accurately reflects the real process of deposit creation, explains that loans themselves generate secondary deposits, which are then multiplied through further lending, creating new deposits.

This research aims to demonstrate that the influence of the euro area monetary cycle on the BH monetary cycle is relatively low compared to other domestic determinants of the BH monetary cycle. We define the monetary cycle as periodic fluctuations in the money supply, represented by the monetary aggregate M2 for BH and M3 for the euro area, and statistically define the monetary cycle as the cyclical component extracted from the ratio of the monetary aggregate to gross domestic product. The influence of base money (M0) on the monetary aggregate M2 is a given under the currency board arrangement, but we also demonstrate the influence of domestic banks' credit activity and the interest rate differential (the gap between foreign and domestic interest rates) on the BH monetary cycle, i.e., on the cyclical component of the M2 aggregate.

Due to the high liquidity of banks, reflected in a high implicit reserve requirement ratio (the ratio of total reserves, which include required and excess reserves, to the reserve base) credit dynamics are controlled by the banks. The second most important component of the BH monetary cycle is the interest rate differential, which is under the control of the Central Bank of Bosnia and Herzegovina (CBBiH). Our hypothesis is that the combined, and in some cases even individual, impact of these two domestic components on the BH monetary cycle exceeds the influence of the euro area monetary cycle.

The first part of this research presents a literature review of studies that have examined this topic, mostly in the context of other countries, given the lack of research on this subject in BH and the fact that the CBBH does not have a reference interest rate on loans to BH banks, since it is not allowed to lend to domestic residents. We also include sources that have examined the issue of discretionary monetary policy and the currency board in BH from other, but related, perspectives. In the following sections, we present the methodological framework of the study, outline the key findings, provide explanations, and link them to the stated research hypotheses. In the conclusion, we summarize the main findings and offer policy recommendations aimed at overcoming the negative phase of the BH monetary cycle.

Literature Review

Contraction in the monetary policy cycle refers to rising interest rates and a reduction in the money supply (monetary policy tightening), while expansion in the cycle refers to lowering interest rates and increasing the money supply (monetary policy easing). Some of the earliest studies of the monetary policy cycle (in the U.S.) linked it to the business cycle and the role of money in the business cycle (Kydland , 1989). According to one such study, changes in the money supply affect the business cycle through three channels, the income effect, the wealth effect, and the substitution effect, while the degree of correlation between changes in money supply and business activity varies over time (Davis , 1968). Later research connected the monetary cycle to the financial cycle, financial stability, and inflation, while retaining its link to the business cycle. (Lane, 2024) provides an overview of the latest tightening cycle of ECB monetary policy and its effects on inflation, yields, and the banking sector, and two other authors do the same for the U.S. economy. Analyzing lessons from past episodes of monetary expansion (growth phases of the monetary cycle), the authors (de Soyres & Saijid , 2024) conclude that the Federal Reserve was not effective in curbing inflation, and that a common outcome of restrictive monetary policy cycles was recession. Bosnian authors (Mitrović & Erceg, 2018) highlight the role of the Central Bank of Bosnia and Herzegovina (CBBiH) in determining the liquidity of BH banks but do not go further to examine the monetary cycle. Another two authors analyze BiH's monetary policy from the standpoint of macroeconomic stability (Nuhanović & Kešetović, 2009). One study addresses BiH's monetary policy from the perspective of monetary stability and economic development (Marjanac , 2014), while another (Tošković , 2018) looks at it through the lens of the credibility of monetary policy under the currency board regime. Our first study on cyclical patterns in the BH economy (Jović, 2021) showed that the business cycle in BH differs significantly from that of the euro area. This divergence requires a greater degree of independence in BiH's monetary policy compared to the policy set by the ECB. If the domestic and foreign business cycles had been synchronized, the fixed exchange rate regime would have eliminated the need for an independent monetary policy in BiH. In that case, adopting the ECB's policy, assuming it is effective, would have been an ideal option for BiH's monetary framework and economy. Our second study on cycles in the BH economy revealed a declining trend in the financial cycle (derived from the credit-to-GDP ratio), which has even been negative in recent years. It also highlighted significant divergence from the financial cycle in the euro area (Jović & Vlašković , 2024). There are also studies that confirmed the impact of monetary policy instruments on certain intermediate variables of BiH's monetary policy (Jović, 2020). A group of U.S. authors linked the monetary, business, and financial cycles and showed that during phases of monetary tightening, if the term spread flattens, net interest margins decrease, which reduces bank profitability and willingness to lend. (Pascal , 2018) demonstrates that if the monetary policy cycle is overly expansionary or abruptly restrictive, it increases risks to financial stability. In the context of the monetary cycle and its connection to the global financial crisis (2007–2009) and the sovereign debt crisis, the ECB published a study (Giannone , Lenza , & Reichlin , 2019), which found that long-term interest rates were exceptionally high, while long-term loans and deposits were very low. These two crises, however, did not significantly affect short-term interest rates, loans, or deposits.

Materials and Methods

The main methodological tool of the research is a multiple regression model, with the ordinary least squares (OLS) used to estimate the parameters of the regression model, and all time series are on a quarterly basis. The biggest challenge in this research was methodological in nature, how to define the monetary policy cycle, or the monetary cycle, in a currency board system that does not lend to residents? Typically, the monetary policy cycle is observed through the central bank's reference interest rate cycle. Accord-

ingly, we considered assigning the remuneration on excess reserves (held by banks at the Central Bank of Bosnia and Herzegovina – CBBiH) the role of a reference interest rate and using its changes as an indicator of the monetary cycle in BiH. However, this approach presents several problems. That interest rate is not a lending rate but a rate on excess reserves, i.e., excess deposits held at the CBBiH, which banks can convert into foreign currency at any time due to the absence of capital controls, thus interrupting the transmission of CBBiH's monetary policy. Furthermore, BH banks are highly liquid; the net interest margin is high due to the bank-centric nature of the financial system, as are the fees for non-interest banking operations (banks are the sole providers of domestic payment services in BiH). About 60% of bank liabilities are non-interest bearing, which results in a weak, almost non-existent, transmission of changes in the excess reserve remuneration rate to banks' lending and deposit rates. Another instrument, the required reserve ratio, is rarely adjusted: from July 2016 to December 2024, the required reserve rate remained unchanged, making it unsuitable as an indicator of the monetary policy cycle. One of the more appropriate approximations of the monetary cycle in a currency board regime that does not allow lending to residents (unlike the currency boards in Bulgaria or Hong Kong, which may lend domestically), in the absence of a representative reference interest rate, is the money supply either in absolute terms or, preferably, relative to economic activity. Due to all the above, we defined the monetary policy cycle (alternatively referred to as the monetary cycle) in Bosnia and Herzegovina as the ratio between the monetary aggregate M2 and nominal GDP, this can also be described as the money supply cycle. For the euro area, to draw a proper analogy while considering the fundamentally different structure of bank balance sheets (which has led to a different liquidity measurement method), we used the broadest monetary aggregate M3 instead of the ECB reference interest rate cycle. Since the money multiplier in BH has remained approximately constant for years, one of the determinants we introduced into the model for BiH's monetary cycle is the cyclical component of base money (M0), which, under the BH currency board, is not influenced by discretionary monetary policy due to the prohibition of ex nihilo money creation. Due to the widespread use of Euribor in loan agreements with variable interest rates in BiH, and the ECB's interest rate channel, we defined the interest rate differential as the difference between the 12-month EURIBOR and the remuneration on reserves above the required reserve level. The financial cycle, both for BH and the euro area, is expressed in the standard form as the ratio of bank loans (to households and non-financial private sectors) to nominal GDP. The cyclical component was extracted using the Hodrick–Prescott filter with a smoothing parameter (lambda) of 400,000. In all cycles, GDP was defined as a moving sum of its quarterly values. We also introduced a dummy variable for Q4 2008, when M2 in BH was strongly influenced by the collapse of the U.S. investment bank Lehman Brothers (September 2008) and the banking panic it triggered in the BH financial market. Publicly available data from the ECB, Eurostat, CBBiH, and the Agency for Statistics of BH (BHAS) were used for the period Q1 2006 – Q2 2024. The variable labels, calculation methods, and the cyclical filtering process are presented below.

Table 1 - Variables Used in the Research

Variable	Label	Source	Calculation Method	Filtering Methodology
Monetary aggregate M0 in BiH	M0	CBBH	–	–
Monetary aggregate M2 in BiH	M2	CBBH	–	–

Monetary aggregate M3 in the euro area	M3	ECB	–	–
Monetary cycle in BiH	MC	Author's calculation	Cyclical component of M2/GDP	HP filter, lambda = 400,000
Monetary cycle in the euro area	MC_EUR	Author's calculation	Cyclical component of M3/GDP	HP filter, lambda = 400,000
Financial cycle in BiH	FC	Author's calculation	Cyclical component of loans/GDP	HP filter, lambda = 400,000
Cycle of base money in BiH	MC_PM	Author's calculation	Cyclical component of base money/GDP	HP filter, lambda = 400,000
Interest rate differential	IRD	ECB and CBBH	12-month Euribor minus remuneration on excess reserves (CBBH)	–

Source: Author.

Results and Discussion

The causal relationship between the variables was quantified through multiple regression models (Table 2). In all equations, the BH monetary cycle exhibits high persistence, measured by the influence of the first lag on the current value of the cycle, which is approximately 1. The effect of the second lag on the monetary cycle is around -0.4, so the combined increase of the first and second autoregressive components of the BiH monetary cycle by 1 pp leads to an approximate increase of 0.6 percentage points in the current value of the monetary cycle.

Table 2 - Overview of Regression Equations, Dependent Variable: BH Monetary Cycle (MC), Q1 2006 – Q2 2024

	EQ 1	EQ 2	EQ 3	EQ 4	EQ 5	EQ 6	EQ 7
Constant				**1.75** (4.7)***	**0.42** (1.7)*		
MC(-1)	**1.08** (10.1)***	**1.06** (9.9)***	**0.93** (8.3)***		**0.72** (11.2)***	**1.05** (9.7)***	**0.93** (7.8)***
MC(-2)	**-0.42** (-4.6)***	**-0.40** (-4.4)***	**-0.35** (-3.9)***			**-0.43** (-4.6)***	**-0.35** (-3.7)***
MC_PM	**0.31** (3.64)***	**0.30** (3.7)***	**0.35** (4.4)***			**0.26** (3.1)***	**0.32** (3.6)***

FC(-1)	**0.09** (3.7)***					**0.06** (2.4)**	**0.09** (3.0)***
FC		**0.09** (3.9)***	**0.10** (4.5)***				
IRD			**- 0.22** (2.7)***	**-1.5** (6.8)***	**-0.30** (1.8)*		**-0.22** (2.2)**
MC_EUR				**0.23** (3.7)***			
MC_EUR(3)					**0.09** (1.96)**	**0.06** (2.1)**	**0.05** (1.7)*
Dummy	**-4.19** (-4.4)***	**-4.13** (-4.3)***	**-3.62** (3.9)***			**-4.3** (-4.5)***	**-3.9** (4.1)***

Diagnostics							
R^2	0.92	0.92	0.93	0.49	0.77	0.91	0.92
Durbin- Watson test	1.98	1.96	1.89	0.45	1.44	2.06	1.92
Jarque-Bera test	5.71 (0.057)	4 (1.13)	2.66 (0.26)	5.95 (0.05)	1.668 (0.000)	3.32 (0.16)	1.88 (0.38)

Note: *** significant at 1%, ** significant at 5%, * significant at 10%.

Source: Ibid

In all equations, as expected, the coefficient for the cyclical component of base money is statistically significant at the 1% level. On average, a 1 percentage point increase in MC_PM raises the BH monetary cycle by 0.3 p.p., which is a relatively high coefficient value, particularly considering that under BiH's monetary regime there is no ex nihilo issuance of base money. The credit activity of banks, represented through the financial cycle, affects the BH monetary cycle either contemporaneously or with a time lag. This confirms the premise of the endogenous theory of money, which holds that lending activity autonomously creates money, increasing the M2 monetary aggregate. On average, a 1 p.p. increase in the financial cycle leads to a 0.08 p.p. increase in the BH monetary cycle relative to its trend value.

The coefficient on the interest rate differential (IRD) is, as expected, negative and statistically significant at the 1% level in two equations (EQ3 and EQ4). In the extreme case (EQ4), a 1 p.p. increase in IRD reduces the value of the monetary cycle (MC) by 1.5 p.p. On average, excluding this extreme value, the effect of IRD is around 0.25 p.p.

Despite the moderate correlation between the domestic (MC) and foreign (MC_EUR) monetary cycles, it was very difficult to find a model specification in which the coefficient for MC_EUR is statistically significant. It is only significant at the 5% level in the fourth equation, which includes both the interest rate differential (IRD) and a constant term. A monetary impulse from the euro area of 1 p.p., represented by the cyclical component of the M3-to-GDP ratio, increases the BH monetary cycle by 0.09 p.p. However, this monetary impulse operates retrospectively rather than prospectively (equation 5). In three specifications, a link was found between the current BH monetary cycle and the foreign monetary cycle, but only after a three-quarter lead, meaning the expected chronological reaction of the domestic cycle to foreign cycle changes was confirmed in just one of the three equations. In specifications that showed a statistically strong link between the foreign and domestic monetary cycles, with the latter responding to the former, the coefficient sign was negative, which contradicts the expected economic logic of a positive connection with the reserve currency country's monetary cycle (as also suggested by the correlation analysis, where the relationship was positive, not inverse). Nonetheless, the regression analysis established a moderate relationship between the two monetary cycles, but the expected causal relationship, where past changes in the foreign monetary cycle lead to future changes in the BH cycle, was confirmed in only one of the three equations. In that fourth equation, the immediate effect of the foreign monetary cycle on the BH cycle is statistically significant in a 1 p.p. to 0.23 p.p. ratio. According to the applied diagnostic indicators, the overall model performance is satisfactory. The explanatory power of the selected variables, measured by the coefficient of determination, is high. The Durbin-Watson statistic significantly deviates from the ideal value of 2 in only two cases, indicating no strong presence of positive or negative autocorrelation of residuals. With the exception of the fifth equation, the residuals are normally distributed (p-values above 5%), meaning we cannot reject the null hypothesis of normal distribution.

Also, by using a simple correlation analysis, we demonstrated the degree of dependence of the BH monetary cycle on both domestic and foreign monetary variables.

Table 3 - Correlation Coefficient Matrix

	MC	MC_PM	FC	IRD	MC_EUR
MC	1.00	0.78	0.36	-0.71	0.54
MC_PM	0.78	1.00	-0.08	-0.32	0.48
FC	0.36	-0.08	1.00	-0.43	0.34
IRD	-0.71	-0.32	-0.43	1.00	-0.29
MC_EUR	0.54	0.48	0.34	-0.29	1.00

Source: Ibid.

In the early years of the observed period, up until the end of 2009 (Figure 1), the divergence between the monetary cycle and the base money cycle was minimal (an average difference of 0.4 percentage points). A significant misalignment between these cycles, despite base money being the main determinant of the M2 monetary aggregate under the currency board regime, persisted, more or less, until the end of 2015 (with an average difference of 1.8 percentage points). This prolonged discrepancy between the two most important monetary cycles largely reflects the extended effects of the global economic crisis (2007–2009) and the euro area sovereign debt crisis.

Until mid-2020, before the effects of pandemic-induced lockdowns reached BiH, the alignment between the monetary cycle and the base money cycle remained strong (average difference of 0.3 percentage

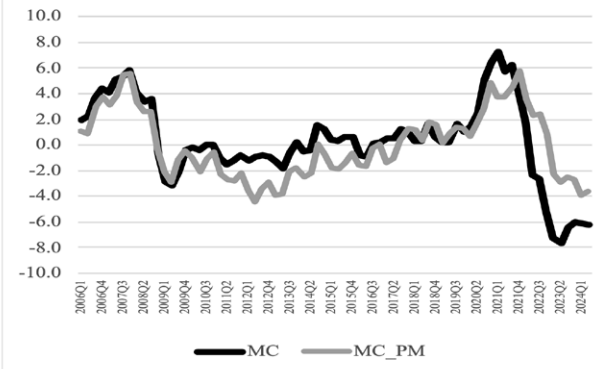
points). After that, a complete decoupling of the M2 and M0 cycles persisted until the end of the observed period. As a result, following an exceptionally expansionary monetary policy by the ECB and peak values of the monetary cycle, economic liquidity dropped to a historic low (the monetary cycle in Q2 2024 was 6.2% below its trend value), and the monetary cycle was, on average, 2 percentage points below the base money cycle. Over this 8-year span (33 quarters), the correlation coefficient between the cycles was 0.78 (Table 3), meaning that 60% of changes in the monetary cycle are determined by changes in base money.

At both the beginning and end of the observed period, a strong connection was established between the M2 monetary aggregate and bank lending, i.e., between the monetary and financial cycles (Figure 2). Between these two periods of strong positive correlation, the monetary cycle fluctuated around zero, while the financial cycle showed a declining trend, briefly interrupted between mid-2016 and mid-2018. By 2024, the negative values of the monetary and financial cycles had nearly converged. The correlation between these two key BH money-related cycles is half as strong as that observed for the base money cycle, but still positive, indicating deposit multiplication and endogenous money creation by commercial banks.

The interest rate differential between foreign (12-month Euribor) and BH interest rates (remuneration on excess reserves) is inversely correlated with the monetary cycle. In absolute terms, this correlation is nearly as strong as that between the monetary cycle and the base money cycle (Figure 3). The interest rate differential explains nearly 50% of the variability in the BH monetary cycle. Since it became clear that the ECB would reverse its monetary policy stance and begin tightening, a particularly strong relationship has formed between these variables, with a correlation coefficient of 0.95. A higher foreign interest rate compared to the domestic rate reflects a greater degree of monetary policy restrictiveness in the euro area relative to BiH.

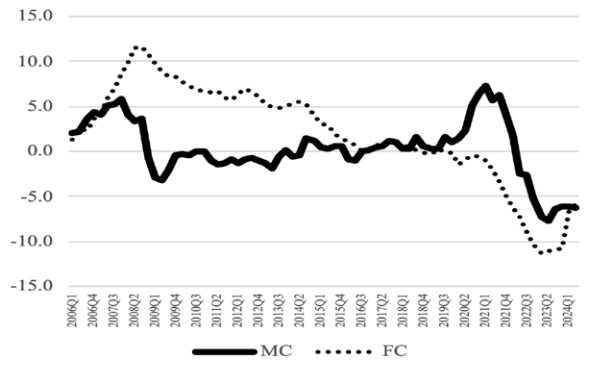
The influence of the euro area monetary cycle on the BH monetary cycle (Figure 4) is moderate in strength, with several distinct phases: periods of divergence between the domestic and foreign cycles (Q1 2010–Q3 2017), strong alignment (Q4 2017–Q2 2022), phases when the domestic cycle exceeds the foreign one (Q3 2020–Q1 2021), and finally (Q2 2022–Q2 2024), a strong direct relationship in which the domestic cycle is significantly lower than the foreign one. On average, 30% of the variability in the BH monetary cycle is directly influenced by changes in the M3 monetary aggregate of the euro area. It is also worth noting that during the first and second pandemic years, except for Q4 2022, the domestic monetary cycle had higher values than the foreign one.

Figure 1. Monetary Cycle and Base Money Cycle in Bosnia and Herzegovina, Q1 2006 – Q2 2024



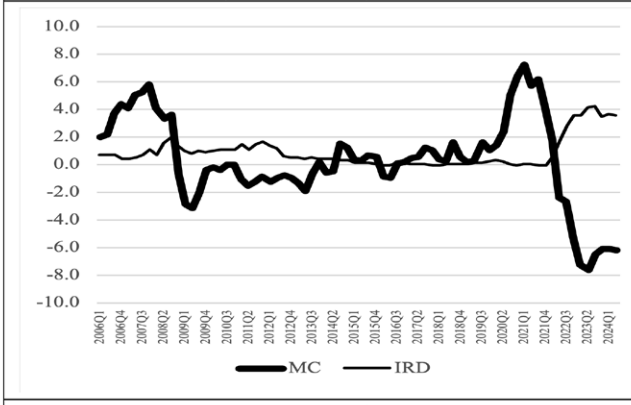
Source: Autor.

Figure 2. Monetary Cycle and Financial Cycle in Bosnia and Herzegovina, Q1 2006 – Q2 2024



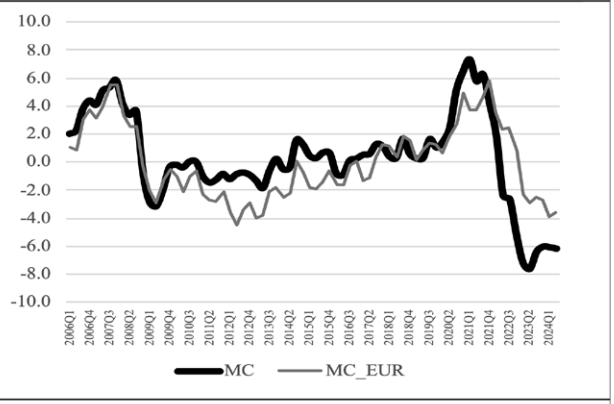
Source: Ibid.

Figure 3. Monetary Cycle in Bosnia and Herzegovina and Interest Rate Differential, Q1 2006 – Q2 2024



Source: Ibid.

Figure 4. Monetary Cycle in Bosnia and Herzegovina and the Monetary Cycle in the Euro Zone, Q1 2006 - Q2 2024



Source: Ibid.

The obtained results are consistent with the working hypotheses presented at the beginning. The autoregressive component is particularly strong, with the first lag positively and the second lag negatively affecting the BH monetary cycle. On average, the previous values of the BH monetary cycle increase its current values by 0.6 p.p. The second most important determinant of the BH monetary cycle is the cycle of base money, which is expected given the currency board framework. On average, a 1 p.p. increase in the base money cycle raises the BH monetary cycle by 0.3 p.p. The third most important component is the interest rate differential between foreign and domestic rates, whose coefficients range between 0.22 and 1.5 p.p. A positive value of this differential reduces liquidity, while a negative value increases the liquidity of the BH economy, as measured by the M2-based monetary cycle. The coefficient for the financial cycle, defined as the cyclical component of the loan-to-GDP ratio, averages 0.095 p.p., meaning that a 1 p.p. deviation from trend increases the BH monetary cycle by that amount. This confirms the endogenous theory of money in the BH banking system, emphasizing the role of banks in deposit creation through the loan-deposit multiplication process and the creation of secondary deposits. Thus, the BH banking system endogenously, internally, and autonomously creates money, and therefore, alongside the Central Bank of Bosnia and Herzegovina, acts as a de facto co-creator of monetary policy.

Concluding Remarks and Recommendations

Neither the financial nor the monetary cycle in Bosnia and Herzegovina has been the subject of extensive research, as the dominant trend in BH economic thought has focused on analyzing variables in absolute terms. The decomposition of variables and the independent analysis of the cyclical component of a time series, within the context of gap analysis, i.e., measuring deviations from the trend, has not long been accepted as a standard method of statistical or econometric analysis.

After previously demonstrating that the business cycle in BH differs from that in the euro area, and that the BH financial cycle is in a declining phase, we continued building the case for a more discretionary monetary policy in BH by constructing a domestic monetary cycle and examining its causal links to key monetary variables. We confirmed the dominant influence of domestic variables on the BH monetary

cycle, with only a marginal effect from the euro area monetary cycle. Together, the domestic financial cycle and the interest rate differential between foreign and domestic rates play a greater role in shaping the BH monetary cycle than the euro area cycle. Taken individually, the impact of the interest rate differential on the BH monetary cycle exceeds the impact of the euro area cycle.

The coefficients of all variables in all equations have the expected signs, with the highest values attributed to the autoregressive component and the cycle of base money in BiH. The high persistence of the BH monetary cycle and the influence of the monetary base on its fluctuations, under a currency board system that cannot lend to residents, are expected characteristics that enable its predictability. Money creation in the BH banking system occurs endogenously through the credit activity of banks, which expand their deposit potential through the deposit-credit multiplication process.

All included cycles or variables, except for the interest rate differential, are directly related to the BH monetary cycle. The inverse relationship between the monetary cycle and the interest rate differential, defined as the difference between the foreign and domestic interest rates, should be interpreted such that a decrease in the foreign interest rate (ceteris paribus) positively affects the BH monetary cycle. This reversal of capital flows benefits Bosnia and Herzegovina by increasing the credit potential of BH banks.

Conversely, reducing the interest rate differential by increasing the domestic interest rate (i.e., the remuneration on excess reserves held by banks at the CBBiH) does not lead to positive changes in the BH financial and monetary cycles, as it represents a restrictive monetary policy. For this reason, monetary policy aimed at increasing bank credit potential and improving the liquidity of the BH economy should be based on two measures: limiting the exposure of BH banks to foreign assets (such as term deposits with non-resident banks, loans to non-residents, and securities issued by non-residents), and introducing a negative remuneration rate on excess reserves. The first measure ensures a reduction in foreign currency claims of BH banks by converting them into reserve account balances at the CBBiH, while the second encourages banks, motivated by cost reduction due to the negative fee, to increase lending activity and thus raise the values of both the financial and monetary cycles.

This research offers a detailed insight into the determinants of the BH monetary cycle, though exclusively from the perspective of monetary economics. Future studies should aim to enrich the monetary cycle equations with explanatory variables from the real sector, such as BH foreign trade with the euro area. Another potential approach to analyzing monetary conditions stems from the fact that there are four common ways to measure them: in addition to the financial and monetary cycles, there is the monetary conditions index and the interest rate cycle. Dedicated research into the latter is currently missing in the monetary framework of Bosnia and Herzegovina. A useful comparative research topic would be the monetary cycle in Bulgaria, whose economy also operates under a currency board regime, but where the Bulgarian National Bank retains the authority to lend to domestic banks.

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