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DETERMINANTE USPEHA POSLOVANJA BANAKA: STUDIJA IZABRANIH SLUČAJA ZEMALJA BIVŠE JUGOSLAVIJE

Dr Vesna Marić
asistent – Beogradska akademija poslovnih i umetničkih strukovnih studija
info@bpa.edu.rs

Prof. Svetlana Ignjatović
redovni profesor, Fakultet za ekonomiju i inženjerski menadžment
projektna@fimek.edu.rs

Prof. Danijela Anđelković
vanredni profesor, Privredna akademija u Novom Sadu
danijela.andjelkovic@gmail.com

Rezime: U radu se ispituju determinante uspeha poslovanja banaka na uzorku zemalja bivše Jugoslavije, primenom panel analize. Istraživanje pokriva period od 2010. do 2020. godine. Osnovni cilj ovog rada jeste da se primenom odgovarajućeg ekonometrijskog modela panel analize odgovori na pitanje koja determinanta uspeha poslovanja banaka u zemljama bivše Jugoslavije jeste najvažnija za uspeh poslovanja banka. Rezultati analiza ukazuju da makroekonomski faktori nemaju statistički značajan uticaj na uspeh poslovanja banka, odnosno da problematični krediti predstavljaju mikroekonomski faktor koji ima najveći uticaj na performanse poslovanja banaka.

Ključne reči: uspeh poslovanja banaka; determinante poslovanja; makroekonomski faktori; mikroekonomski faktori; panel analiza; metoda fiksnih efekata; metoda slučajnih efekata

JEL klasifikacija: G21, C22, C52, C53

Uvod

Značaj banaka za bitisanje nacionalnih ekonomija, pa i šire, stabilnost međunarodnog finansijskog sistema, uticala je da poslovanje banaka bude predmet istraživanja brojnih radova i studija. Opšte je poznato da zdrav bankarski sistem predstavlja neophodan uslov za ekonomski rast jer obezbeđuje makroekonomsku stabilnost, a da su likvidne i profitabilne banke osnova te stabilnosti (Ayadurai & Eskandari, 2018). Iz tog razloga permanentni fokus stručne i akademske javnosti jeste na determinantama poslovanja banaka, pre svega onih koje utiču na stopu nenaplativih kredita, povećanje moralnog hazarda, makroekonomske uslove i sl. Međutim, uprkos velikom interesovanju za proučavanje ovih faktora relativno je mali broj radova koji se istovremeno fokusiraju na proučavanje uticaja svih najznačajnijih makroekonomskih i mikroekonomskih faktora uspeha poslovanja banaka. Naročito je ovo evidentno za mala finansijska tržišta u razvoju. Zbog kompleksnosti bankarskog sistema i poslovanja banaka skoro je nemoguće uzeti u obzir sve faktore. Naime, složenost bankarskog poslovanja dovodi do toga, da je lista faktora koji utiču na uspeh njihovog poslovanja, skoro neiscrpna i slobodno se može reći da je svakog dana sve veća i veća. Strukturalne promene koje su se desile na međunarodnom finansijskom tržištu tokom poslednjih godina XX veka, praćene deregulacijom i internacionalizacijom poslovanja banaka, kao i rapidnim rastom tržišta derivata, uticale su da banke prošire svoju ponudu finansijskih usluga i trgovačkih aktivnosti (Radivojević, 2014), sa jedne stane, ali i na intenziviranje dužničko-poverilačkih aranžmana sa klijentima koji imaju niski kreditni rejting, sa druge strane. Istovremeno, tehnološki razvoj praćen redukovanjem zakonske regulative u oblasti poslovanja banaka uticao je na pojavu novih finansijskih instrumenata, tehnika, strategija i finansijskog inženjeringa. Posledica svega ovoga jeste konstantno proširivanje liste determinanti koji utiču na uspeh poslovanja banaka.

S obzirom na to da je sve prethodno rečeno primarno uticalo da banke svoje poslovne aktivnosti prošire ulazeći u poslove koji nisu bili tradicionalno bankarski ili nisu bili dominantni u njihovom poslovanju, sa jedne strane, ali i na povećanje kreditnog rizika banaka usled ublažavanja kriterijuma i procedura skrininga loših kredita, primarni fokus akademske javnosti, po pitanju proučavanja faktora uspeha poslovanja banaka bio je na determinantama nenaplativih kredita. Takva istraživanja sproveli su Makri & Papadatos (2012), Makri et al. (2014), Moinescu (2012), Louzis et al. (2012), Stakic (2014). Radivojević & Jovović (2017). Iako među ovim autorima postoje čak i oprečni nalazi u pogledu uticaja pojedinih makroekonomskih ili mikroekonomskih faktora na stopu nenaplativih kredita, ipak su saglasna da je stopa prinosa problematičnih kredita značajan faktor uspeha poslovanja banaka jer utiče na nelikvidnosti i profitabilnost banaka, a time u krajnjoj instanci na makroekonomsku stabilnost (Hassan et al. 2011).

Makroekonomske determinante uspeha poslovanja banaka bile su predmet istraživanja kod autora Athanasoglou *et al.* (2006; 2008), Pasiourias & Kosmidou (2007), Albertazzi & Gambacorta (2009), Sufian & Habibullah (2009), Vong & Chan (2009), Rekik & Kalai (2018), Rupeika-Apoga *et al.* (2018), Borges & Tavares (2020) i dr. U okviru ovih istraživanja moguće je izdiferencirati dve grupe istraživanja. Prvu grupu istraživanja čine one studije koje su ispitivale uticaj tzv. opštih makroekonomskih determinanti, kao što su bruto domaći proizvod (BDP), inflacija, nezaposlenost, cene, devizni kurs, nivo privredne aktivnosti, obim uvoza i izvoza i sl.

Takva istraživanja sproveli su Demirgüç-Kunt & Huizinga (1999), Athanasoglou *et al.* (2006; 2008), Anbar & Alper (2011) i dr. Athanasoglou *et al*. (2006; 2008) pronašli su da bruto domaći proizvod (BDP) ima značajan i pozitivan uticaj na poslovanje banaka. Suprotno njima, nalazi Demirgüç-Kunt & Huizinga (1999), Pasiourias & Kosmidou (2007), Sufian & Habibullah (2009) i Vong & Chan (2009) impliciraju nepostojanje statistički značajne veze između uspeha poslovanja banaka i ekonomskog rasta. Ovo opravdavaju činjenicom da u uslovima jačanja privrednih aktivnosti, investitori investiciona sredstva nabavljaju iz drugih izvora, kao što su zadržane dobiti ili emitovanjem hartija od vrednosti, tako da im banke nisu primarni izvori svežeg kapitala. Važnost izučavanja ove determinante poslovanja banaka ogleda se i u nalazima istraživanja Beltratti & Stulz (2012), Erkens *et al.* (2012), Serrano-Cinca *et al.* (2014), Adebambo *et al.* (2015), Cox *et al.* (2017), kao i Avkiran *et al.* (2018), koji su proučavali performanse banaka tokom svetske ekonomske krize. Nalazi ovih istraživanja ukazuju da nisu sve banke podjednako bile pogođene krizom i opadanjem BDP-a, što implicira da neki drugi faktori imaju značajan uticaj na uspeh poslovanja.

Značajan broj radova posvećen je inflaciji. Kada je u pitanju ova makroekonomska determinanta poslovanja banaka, takođe postoje oprečni nalazi; od toga da ima pozitivan uticaj (Pan & Pan (2014), Tan & Floros (2012), Andries et al.(2016)), odnosno negativan uticaj (Abreu & Mendes (2002) Sufian & Habibullah (2009), Sufian (2010), Moyo & Tursoy (2020)), pa do onih koji ističu da uticaj ove determinante zavisi od toga koliko su banke sposobne ispravno da predvide kretanje stope inflacije. Tako, Perry (1992) ističe da ukoliko banke budu uspešne u predviđanju stope rasta inflacije, onda će moći da prilagode kamatne stope i na taj način će uspeti da poboljšaju svoje poslovne rezultate. Za razliku od Cetin (2019) koji je pronašao pozitivan uticaj inflacije na ROA banke u zemljama u razvoju, Hamadi & Awdeh (2012) nisu pronašli da postoji bilo kakva veza između ove determinante i uspeha poslovanja banaka.

Ispitujući opšte makroekonomske determinante uspeha poslovanja banaka u Centralnoj i Istočnoj Evropi, Horobet *et al.* (2021) su otkrili da stopa nezaposlenosti ima negativan uticaj na uspeh poslovanja banaka.

Drugu (pod) grupu istraživanja čine studije koje su za predmet istraživanja imale specifične makroekonomske faktore kao što su politički rizik zemlje, državne intervencije i institucionalne podrške razvoju bankarskog sektora i sl. Uticaj vladinih mera i deregulacije na uspeh poslovanja banaka bili su predmet istraživanja kod Beck *et al.* (2010), Boustanifar (2014), Zakaria *et al.* (2015) i dr. Oni su utvrdili da deregulacija u oblasti bankarstva otvara prostor za ulazak stranih banaka, kao i da povoljno utiče na druge sektore privrede u smislu smanjenja stopa nezaposlenosti, bolje alokacije kapitala i sl. Međutim, na osnovu njihovih istraživanja teško se može izvesti direktan i precizan zaključak u pogledu njihovog uticaja na performanse banaka. Slične nalaze predstavili su i Isfaq & Khan (2015). Za razliku od njih Daly & Frikha (2017) su utvrdili da makroekonomski faktori povezani sa vladinim intervencijama negativno utiču na rezultate poslovanja banaka. Onofrei et al. (2018) posebno navode nevladine kredite kao značajnu determinantu uspeha poslovanja banaka. Borges & Tavares (2020) otkrili su da koncentracija banaka na tržištu ima pozitivan uticaj na performanse poslovanja.

Njihovi nalazi u skladu su sa rezultatima istraživanja Goddard *et al.* (2004), Bikker & Bos (2005), Kosmidou *et al.* (2005), Pasiourias & Kosmidou (2007) i Trujillo-Ponce (2013). Pastor et al. (2000) i Hermes &Lensink (2004) ovo opravdavaju činjenicom da veća koncentracija banaka, generisana pre svega, ulaskom velikih inostranih banaka na mala i nerazvijena tržišta utiče na to da domaće banke unaprede svoje poslovanje. Rezultati njihovog istraživanja ukazuju da su na tržištima u razvoju domaće banke po ulasku inostranih banaka imale značajno niže stope ne problematičnih kredita. Hermes & Lensink (2004) ističu da povećanje koncentracije banaka implicira i uvođenje novih usluga čime se podstiče konkurencija među bankama da razvijaju nove usluge i unaprede svoje poslovanje. Međutim, sa druge strane istraživanja Barajas *et al.* (2000) i Clarke *et al.* (2000) ukazuju na negativne posledice. Ovo opravdavaju nalazima da su banke primorane da ulažu veća sredstva u unapređenje poslovanja, čime se povećavaju operativni troškovi, koji ne mogu da budu adekvatno pokriveni. Clarke *et al.* (2000) posebno ovo navodi u situaciji kada na tržište ulaze strane banke koje imaju određene komparativne prednosti u odnosu na domaće.

Drugu veliku grupu istraživanja čine studije koje su proučavale mikroekonomske determinante poslovanja banaka. Takve studije uglavnom su se fokusirale na proučavanje uticaja problematičnih kredita, operativne troškove, stopu adekvatnosti kapitala, kvalitet aktive banke, kvalitet menadžmenta i njihov stav prema riziku i sl. Autori poput Barros *et al.* (2007), Chiorazzo *et al.* (2008), García-Herrero et al. (2009) i sl. navode da uprkos većim operativnim troškovima upravljanja velikim portfoliom kredita, profitabilnost banaka bi trebalo da se poveća zbog davanja većeg broja kredita. Međutim, najnovija istraživanja Christaria & Kurnia (2016), Anastasiou *et al.* (2016), Akter & Roy (2017), Kingu *et al.* (2018), Petkovski *et al.* (2018), Khan & Ahmad (2017) i Horobet et al. (2021) jasno ukazuju da povećanje nekvalitetnih kredita negativno utiče na profitabilnost banaka. Horobet *et al.* (2021) ukazuju da su problematični krediti najvažnija determinanta uspeha poslovanja banka. Sa druge strane, rezultati istraživanja Psaila *et al.* (2019) ukazuju da je to stopa solventnosti banke. Slične nalaze predstavili su i Staikouras & Wood (2004), Capraru & Ihnatov (2014) i Curak *et al.* (2012).

Poslednjih godina sve veći je fokus ne samo na kvalitet menadžmenta, već i na ceo bord direktora (King *et al.* (2016), Fernandes et al. (2017), Pereira & Filipe (2018)). Tako su Pereira & Filipe (2018) pronašli da nivo obrazovanja menadžmenta banke predstavlja značajnu determinantu uspeha poslovanja. Wyród-Wróbel & Biesok (2017), kao i Tailab (2020) otkrili su da uspeh poslovanja banke u vreme krize zavisi dominantno od sposobnosti menadžmenta da odredi prioritete na strateškom i operativnom nivou ključna determinanta uspeha. Proučavajući determinante nenaplativih kredita, Salas & Saurina (2002) i Espinoza & Prasad (2010) kvalitet menadžmenta banke izučavali su preko neto kamatne marže, ističući da ona predstavlja dobar indikator koliko optimalno banka donosi investicione odluke. Pozitivan uticaj neto kamatne marže na performanse banke predstavili su i KuKaj *et al.* (2020). Radivojević & Jovović (2017) ističu da stopa adekvatnosti kapitala, takođe, predstavlja važan indikator kvaliteta menadžmenta banke jer odražava stav menadžmenta prema riziku, dok Stakić (2014) ističe da su to rezervisanja za potencijalne gubitke. Izdvajanjem većih rezervisanja redukuje se profitabilnost, ali sa druge strane se jača likvidnost banke u srednjem roku, tako da je teško proceniti pravi uticaj ovog faktora na uspeh poslovanja banke.

Značaj istovremenog proučavanja makroekonomskih i mikroekonomskih faktora poslovanja banaka najbolje oslikavaju rezultati istraživanja Sufian *et al.* (2012) koji impliciraju da makroekonomski faktori kao što su kreditni rizik, veličina marže, operativni troškovi, veličina banke i sl. imaju različit značaj u zavisnosti od makroekonomskog konteksta u kome banke posluju. Slično navode i Horobet *et al.* (2021). Analizirajući studije koje su za predmet istraživanja imale makroekonomske i mikroekonomske determinante poslovanja banaka, utvrdili su da uticaj determinanti ne zavisi od perioda istraživanja, već od razvijenosti finansijskog sektora. Uticaj determinanti poslovanja se razlikuje između razvijenih i nerazvijenih finansijskih tržišta. Saznanja da se uticaji pojedinih determinanti poslovanja banaka, poput stope inflacije i stope koncentracije, razlikuju u evropskim zemljama u razvoju u odnosu na druga tržišta u razvoju (Mirzaei et al. (2013), García-Herrero *et al.* (2009), Demirgüç-Kunt & Huizinga (1999), Sufian (2009), Horobet *et al.* (2021)) ukazuju na potrebu da se njihov uticaj ispituje posebno za grupe zemalja koje imaju slične karakteristike.

Imajući u vidu prethodno rečeno, cilj ovog rada jeste da ispita uticaj determinanti poslovanja na uspeh poslovanja banaka koje posluju u zemljama republikama bivše Jugoslavije, a koje, prema brojnim autorima, su identifikovane kao ključne makroekonomske determinante poslovanja, kao što su BDP, inflacije, nezaposlenosti, koncentracija banaka na tržištu i (ne) stabilnost političkog okruženja. Predmet istraživanja su i mikroekonomske determinante, identifikovane kao ključne od stane brojnih autora, kao što su nenaplativi krediti, solventnost i kvalitet menadžmenta banke. Istraživanje je sprovedeno na primeru četiri bivše republike Jugoslavije: Republika Srbija, Crna Gora, Bosna i Hercegovina i Republika Hrvatska.

Podaci i metodologija istraživanja

Kako je već istaknuto, osnovni cilj rada jeste da se ispita uticaj ključnih makroekonomskih i mikroekonomskih determinanti na uspeh poslovanja banaka, koje posluju u zemljama bivše Jugoslavije: Republici Srbiji, Crnoj Gori, Bosni i Hercegovini i Hrvatskoj. Istraživanje obuhvata period od 2010. do 2020. godine. Podaci potrebni za istraživanje prikupljeni su iz baze podataka *Eurostata.* Za ispitivanje uticaja ključnih determinanti na uspeh poslovanja banaka koristi se panel analiza i to nebalansiranih panel podataka. Ova vrsta analiza izabrana je jer omogućava da se kooptiraju obrasci u ponašanju banaka, kao jedinica posmatranja, tokom perioda istraživanja.

Uzimajući u obzir navode Chandler-a & Hanks-a (1996) i Curcic *et al.* (2020), ne čudi činjenica zašto najveći broj istraživanja koja se bave izučavanjem determinanti uspeha poslovanja organizacija, uspeh poslovanja iskazuju kroz profitabilnost. Kada je reč o poslovanju banaka, u akademskim krugovima postoji neslaganje oko toga da li je ROA ili ROE najbolja mera uspeha poslovanja banke. Autori poput Krakah & Ameyaw (2010) ističu da je to ROA jer je oslobođena od uticaja kapitalnih multiplikatora. Sa druge stane, u prilog ROE navode se argumenti da vanbilansna aktiva predstavlja značajan izvor profita. Naročito se ovo apostrofira u poslovanju evropskih banaka. Međutim, uprkos svojim ograničenjima za potrebe ovog rada, uspeh poslovanja banaka izražava se kroz ROA. Ovakav izbor u skladu je sa radovima Demirgüç-Kunt & Huizinga (1999), Athanasoglou *et al.* (2006), kao i Capraru & Ihnatov (2014), Borgesa & Taverna (2020) i dr.

Imajući u vidu u uvodnom delu rada citirane autore, za potrebe ovog rada BDP se izražava kroz stopu BDP-a, koja je transformisana u logaritamsku funkciju i kao takva predstavlja rast BDP-a tokom godina. Očekuje se da stopa rasta BDP-a ima pozitivan uticaj na uspeh poslovanja banka. Inflacija se izražava kroz stopu inflacije. Očekuje se da stopa inflacije bude negativno korelisana sa uspehom poslovanja banaka. Nezaposlenost se iskazuje kroz stopu rasta nezaposlenosti i takođe se očekuje da ima negativan uticaj na uspeh poslovanja banaka, dok se koncentracija banaka na tržištu iskazuje primenom indeksa koncetracije, koji se kreće u rasponu od 0 do 100.

Iako je uobičajeno da se (ne)stabilnost političkog okruženja, kao sveobuhvatnog ambijenta koji utiče na sve aktere privrednog života u jednoj ekonomiji, iskazuje kroz indikatore makroekonomske stabilnosti, za potrebe ovog rada iskazana je kroz indeks političkog rizika. Naime, zaključci Papovića *et al.* (2020), da strani investitori često usled povoljnih institucionalnih podrški, kao izraza volja kreatora političkog okruženja vrše određena ulaganja, uprkos lošim vrednostima indikatora makroekonomske stabilnosti. To ukazuje na potrebu da bi kod ove determinante poslovanja banaka trebalo uključiti i druge indikatore, koji predstavljaju izraz političkog rizika. Iz tog razloga za potrebe ovog rada izabran je *Indeks političke stabilnosti.*

Kao indikator problematičnih kredita, u ovom radu koristi se stopa problematičnih kredita u odnosu na ukupne kredite banke. Budući da stopa adekvatnosti kapitala predstavlja dobar indikator solventnosti banke, koji je istovremeno u visokoj korelaciji sa leveridžom, te se ona koristi za izražavanje ove determinante uspeha poslovanja. Pored ove dve varijable u istraživanje su uključene i stopa neto marže i stopa rezervi za pokriće potencijalnih gubitaka, kao izraz kvaliteta menadžmenta banke i njihovog stava prema riziku. Očekivano je da veća stopa neto marže pozitivno utiče na uspeh poslovanja banke, odnosno da viša stopa rezervi za pokriće potencijalnih gubitaka utiče negativno. Za potrebe ovog istraživanja razvijen je ekonometrijski model koji se može prikazati na sledeći način:

$$ROA_{i,t} = \beta_1 + \beta_2 gdp_{i,t} + \beta_3 unr_{i,t} + \beta_4 inf_{i,t} + \beta_5 HHI_{i,t} + \beta_6 IPR_{i,t} + \beta_7 npl + \beta_8 nimr + \beta_9 cap + \beta_7 llp + \varepsilon_{i,t} \quad (1)$$

pri čemu su:

ROA - *stopa prinosa na aktivu za i-tu zemlju u (t) vremenskom periodu*
$gdp_{i,t}$ - *stopa bruto domaćeg proizvoda za i-tu zemlju u (t) vremenskom periodu*
$unr_{i,t}$ - *stopa nezaposlenosti za i-tu zemlju u (t) vremenskom periodu*
$inf_{i,t}$ - *stopa inflacije za i-tu zemlju u (t) vremenskom periodu*
$HHI_{i,t}$ - *Indeks koncentracije za i-tu zemlju u (t) vremenskom periodu*
$IPS_{i,t}$ - *Indeks političke stabilnosti za i-tu zemlju u (t) vremenskom periodu*
$npl_{i,t}$ - *stopa neto nenaplativih kredita za i-tu zemlju u (t) vremenskom periodu*
$nimr_{i,t}$ - *stopa neto kamatne marže za i-tu zemlju u (t) vremenskom periodu*
$cap_{i,t}$ - *stopa adekvantosti kapitala između kapitala za i-tu zemlju u (t) vremenskom periodu*
$llp_{i,t}$ - *stopa rezervi za pokriće potencijalnih gubitaka*
$\varepsilon_{i,t}$ - *slučajna greška modela*

Empirijska analiza i diskusija dobijenih rezultata

U tabeli 1 prikazani su rezultati deskriptivne statistike skupa podataka. ROA se kreće od -4.342 do 2.308, što ukazuje na veoma visok disparitet između minimalne i maksimalne vrednosti profitabilnosti među bankama. U prilog ovome svedoči i veoma visoka vrednost standardne devijacije ROA. Negativna vrednost koeficijenta asimetrije u kombinaciji sa veoma visokom vrednošću koeficijenta spljoštenosti ukazuje na veću verovatnoću ostvarivanja negativnih rezultata poslovanja u budućnosti u odnosu na pozitivne. Međutim, pozitivna vrednost ove varijable ukazuje da su banke u proseku u ovim zemljama tokom posmatranog perioda bile uspešne u svom poslovanju. Velika razlika između maksimalne i minimalne vrednosti *gdp-a*, kao i velika vrednost standardne devijacije ove varijable jasan je znak razlika u ekonomskom razvoju među ovim zemljama u posmatranom periodu. Uprkos činjenici da su u posmatranom periodu sve zemlje ostvarile rast *gdp-a*, negativna vrednost koeficijenta asimetrije upućuje na oprez. Visoke vrednosti stope nezaposlenosti ukazuju da se ove zemlje suočavaju sa problemom nezaposlenosti, dok uprkos velikom rasponu između minimalne i maksimalne vrednosti stope inflacije, relativno niska prosečna vrednost *inf* varijable ukazuje da ove zemlje nisu imale značajnijih problema sa inflacijom. Međutim, visoke vrednosti deskriptivne statistike indeksa koncentracije, ukazuju na visoku koncetraciju, odnosno relativno nisku konkurenciju među bankama, što s aspekata klijenata nije dobro, ali s apsekta poslovanja banaka može da predstavlja determinantu koja će da ima pozitivan predznak, jer relativno mali broj banaka ostvaruje velika tržišna učešća. Relativno niske, pa i negativne vrednosti indeksa političke stabilnosti ukazuje na nestabilno makroekonomsko okruženje, što može da ima negativan uticaj na poslovanje banaka. Relativno visoke vrednosti deskriptivne statistike problematičnih kredita ukazuje na veliki potencijal u nenaplativim kreditima, što će se negativno odraziti na uspeh poslovanja. Otuda, očekuje se da ova determinanta ima negativan uticaj na uspeh poslovanja banaka, uprkos tvrdnjama Barros *et al.* (2007), Chiorazzo *et al.* (2008), García-Herrero *et al.* (2009) da će usled povećanja kreditnog portfolija banke da ostvare veće prihode. Relativno visoke vrednosti *llp* i *cap* ukazuju na relativnu averziju menadžmenta prema riziku i vođenje oprezne poslovne politike. Očekivano je da veća vrednost *llp* negativno utiču na uspeh poslovanja banaka iz razloga što je veći deo sredstava *zamrznut*, a da cap kao indikator solventnosti ima pozitivan uticaj. Iznenađuje negativna vrednost stope neto kamatnih marži, kao i negativna vrednost koeficijenta asimetrije kod ove varijable, što upućuje na mogućnost da aktivne kamatne stope budu niže u odnosu na pasivne.

Tabela 1 - Deskriptivna statistika izabranih varijabli

	$ROA_{i,t}$	$gdp_{i,t}$	$unr_{i,t}$	$inf_{i,t}$	$HHI_{i,t}$	$IPS_{i,t}$	$nlp_{i,t}$
Sredina	0,465	1,198	17,792	1,774	67,925	0,105	12,808
Stand. devijacija	1,063	3,629	5,704	2,515	11,172	0,446	5,128
Koef. spljoštenosti	9,430	9,660	-0,432	4,008	-1,325	-0,727	-0,959
Koef. asimetrije	-2,359	-2,661	0,165	1,714	-0,046	-0,104	0,045
Minimum	-4,342	-15,307	6,620	-1,584	49,435	-0,900	3,700
Maksimum	2,308	5,078	28,010	11,137	90,964	0,800	21,600
Br. obs.	44	44	44	44	44	32	44
	$nimr_{i,t}$	$cap_{i,t}$	$llp_{i,t}$				
Sredina	4,710	14,227	75,172				
Stand. devijacija	2,413	4,108	27,170				
Koef. spljoštenosti	9,663	-0,949	-0,755				
Koef. asimetrije	-2,125	0,355	0,621				
Minimum	-6,444	8,231	38,799				
Maksimum	8,619	20,890	133,600				
Br. obs.	44	44	44				

Izvor: Autor

Kako bi se identifikovao potencijalni problem multikolinearnosti, sprovedena je analiza korelacije između varijabli. U tabeli 2 prikaza je matrica korelacije. Budući da postoji jaka korelacija između varijable *IPS* i *HHI*, iz dalje analize je izostavljena varijabla *IPS*.

Tabela 2 - Matrica korelacije

	$ROA_{i,t}$	$gdp_{i,t}$	$unr_{i,t}$	$inf_{i,t}$	$HHI_{i,t}$	$IPS_{i,t}$	$nlp_{i,t}$	$nimr_{i,t}$	$cap_{i,t}$	$llp_{i,t}$
$ROA_{i,t}$	1,000									
$gdp_{i,t}$	0,195	1,000								
$unr_{i,t}$	-0,071	0,031	1,000							
$inf_{i,t}$	0,012	0,050	0,165	1,000						
$HHI_{i,t}$	-0,254	-0,134	-0,408	-0,246	1,000					
$IPS_{i,t}$	-0,249	0,010	-0,403	0,046	0,815	1,000				
$nlp_{i,t}$	-0,288	0,096	0,466	0,340	0,106	0,329	1,000			
$nimr_{i,t}$	-0,376	-0,051	0,016	-0,034	0,498	0,268	0,163	1,000		
$cap_{i,t}$	0,137	0,039	-0,057	0,423	-0,584	-0,185	0,122	-0,360	1,000	
$llp_{i,t}$	0,306	0,097	-0,031	-0,301	0,482	0,009	-0,093	0,246	-0,722	1,000

Izvor: Autor

Validna primena panel analize podrazumeva da serije podataka pokazuju osobine stacionarnosti. Iz tog razloga u radu je izvršeno testiranje prisustva jediničnog korena u panel podacima primenom Levin–Lin–Chu (LLC) testa. Rezultati predstavljeni u tabeli 3 ukazuju da varijable *HHI*, cap i *llp* nisu stacionarne na osnovnom nivou. Dobijeni rezultati sugerišu na potrebu da se primenom tehnike diferencijacije serije ovih varijabli transformišu stacionarne. Iako je uobičajena praksa da se ova vrsta testa koristi u međunarodnim finansijama i makroekonomiji (Choi, 2001), pretpostavka na kojoj počiva LLC test, da sve komponente imaju isti autoregresioni koeficijent, ograničava njegovu primenu u analizi vremenskih serija. Iz tog razloga u radu je izvršeno dodatno testiranje stacionarnosti primenom KPSS testa, metodologije koju je predložio (Choi, 2001), a koja počiva na tvz. meta analizi. Rezultati su prikazani u tabeli 1A u prilogu rada. Imajući u vidu rezultate, varijable su transformisane u stacionarne.

Tabela 3 - Rezultati LLC testa

Varijable		LLC test
$ROA_{i,t}$	Nivo	0,0240
	1. Diferencijala	-
$gdp_{i,t}$	Nivo	0,0101
	1. Diferencijala	-
$unr_{i,t}$	Nivo	0,0001
	1. Diferencijala	-
$inf_{i,t}$	Nivo	0,0003
	1. Diferencijala	-
$HHI_{i,t}$	Nivo	0,621
	1. Diferencijala	0,000***
$nlp_{i,t}$	Nivo	0,018
	1. Diferencijala	-
$nimr_{i,t}$	Nivo	0,002
	1. Diferencijala	
$cap_{i,t}$	Nivo	0,141
	1. Diferencijala	0,000***
$llp_{i,t}$	Nivo	0,844
	1. Diferencijala	0,000***

Izvor: Autor

Primenom dva ocenjivača panel podataka, metodom fiksnih efekata (FE) i slučajnih efekta (RE) ocenjeni su parametri modela (1). Rezultati ocene parametara modela prikazani su u tabeli 4.

Tabela 4 - Ocene parametara modela (1)

FE metod					
Varijable	Koeficijenti	St. greške	t-racio	p-vrednost	
konstanta	3,022	3,893	0,776	0,447	
$gdp_{i,t}$	0,001	0,024	0,034	0,974	
$unr_{i,t}$	-0,013	0,049	-0,256	0,801	
$inf_{i,t}$	-0,041	0,068	-0,600	0,556	
$HHI_{i,t}$	-0,053	0,035	-1,526	0,143	
$nlp_{i,t}$	-0,094	0,034	-2,785	0,012	**
$nimr_{i,t}$	0,168	0,112	1,497	0,151	
$cap_{i,t}$	-0,048	0,167	-0,290	0,775	
$llp_{i,t}$	0,031	0,028	1,115	0,279	
Zajednički test izabranih regresora P(F(9, 19) > 6,388) = 0,000					
Test različitih odsečka P(F(3, 19) > 0,427) = 0,735					
LSDV R^2 = 0,773					
Within R^2 = 0,751					
Test normalnosti distribucije reziduala: $x^2(2)$ = 1,312 (0,518)					
Durbin-Watson = 2,513					
RE metod					
Varijable	Koeficijenti	St. greške	t-racio	p-vrednost	
konstanta	3,040	3,446	0,882	0,37	
$gdp_{i,t}$	0,006	0,021	0,265	0,791	
$unr_{i,t}$	-0,030	0,038	-0,799	0,425	
$inf_{i,t}$	-0,054	0,061	-0,879	0,380	
$HHI_{i,t}$	-0,052	0,030	-1,742	0,081	**
$nlp_{i,t}$	-0,091	0,030	-2,980	0,003	***
$nimr_{i,t}$	0,142	0,098	1,451	0,147	
$cap_{i,t}$	0,034	0,116	0,294	0,769	
$llp_{i,t}$	0,020	0,020	0,995	0,320	
Zajednički test izabranih regresora: $x^2(9)$ = 63,632 (0,000)					
Breusch-Pagan-ov test: $x^2(1)$ = 2,250 (0,133)					
Hausman-ov test: $x^2(3)$ = 1,134 (0,768					
R^2 = 0,510					
Test normalnosti distribucije reziduala $x^2(2)$ = 3,317 (0,190)					
Durbin-Watson = 2,513					

Napomena: ***, **, * označavaju nivo značajnosti od 1%, 5% i 10% redom.
Izvor: Autor

Zajednički test izabranih regresora ukazuje da su oba modela ispravno specificirana, odnosno da su izabrani pravi regresori. Budući da ne postoji jedinstveno tačan način izračunavanja koeficijenta determinacije kada je u pitanju model FE u radu je izračunat LSDV koeficijent determinacije, kao i tzv. „within" koeficijent determinacije. Vrednosti oba koeficijenta pokazuju da model preko 70% varijacija u zavisnoj varijabli se može objasniti izabranim varijablama. Test normalnosti distribucije reziduala i autokorelacije reziduala FE modela, ukazuju na adekvatnost modela. Međutim, vrednost Hausman-ovog testa implicira da je za ocenu parametara modela bolji RE metod u odnosu na FE. Sa druge strane, RE model ima značajno niži koeficijent determinacije (R^2 = 0 ,510). Test normalnosti distribucije reziduala i autokorelacije reziduala RE modela, ukazuju da je model adekvatan.

Ocene parametara modela (1) koje su dobijene primenom obe metode ukazuju da je stopa problematičnih kredita ključni faktor uspeha poslovanja. Svako povećanje ove stope od 1% imaće za posledicu pogoršanje profitabilnosti banaka od oko 0,09%. Ovakav nalaz u skladu je sa nalazima Christaria & Kurnia (2016), Anastasiou *et al.* (2016), Akter & Roy (2017) Kingu et al. (2018), Petkovski *et al.* (2018) i Khan & Ahmad (2017). Budući da ocene parametara modela (1) pokazuju da *cap* nije statistički značajna varijabla, što implicira da solventnost, za koju Psaila *et al.* (2019) ističu da je značajnija determinanta u odnosu na stopu problematičnih kredita, nalaz iz ovog rada podržava stav Horobet *et al*. (2021) da su problematični krediti najvažnija determinanta uspeha poslovanja banka. Analiza ocene parametara modela (1) takođe ukazuje da je koncetracija značajna determinanta uspeha poslovanja banaka. Negativna vrednost koeficijenta varijable *HHI* implicira da svako povećanje konkurencije između banaka, odnosno smanjenje koncentracije, pozitivno utiče na poslovanje banaka. Ovo se može opravdati time da pojava novih konkurenata zahteva od banaka na tržištu da više ulažu u unapređenje efikasnosti poslovanja. Ovakav nalaz u skladu je sa nalazima Clarke *et al.* (2000), mada oni razloge negativnog uticaja povećanja koncetracije pronalaze u činjenici da ulaskom velikih i stranih banaka na domaće tržište primoravaju domaće banke da više ulažu u unapređenje svojih usluga, čime im se značajno povećavaju operativni troškovi.

Što se tiče ostalih determinanti, istraživanje je pokazalo da one nemaju značajan uticaj na uspeh poslovanja banaka. U kontekstu makroekonomskih determinanti ovakav nalaz i nije iznenađujući, budući da postoje studije koje su otkrile da određene makroekonomske determinante, uprkos očekivanjima, nisu imale statistički značajan uticaj. Naročito je ovo evidentno u slučaju uticaja inflacije, nezaposlenosti, ali i ekonomskog rasta privrede. Međutim, iznenađujući je podatak da je istraživanje pokazalo da neto kamatna marža nema statistički značajan uticaj na uspeh poslovanja banaka. Ovo može da implicira da su banke u prethodnom periodu sprovodile loše investicione politike, odnosno da su značajnije prihode ostvarivali kroz aktivnosti koje nisu tradicionalno bankarski dominantne. Uzrok ovakvom rezultatu može se naći i u nesavršenosti modela. Naime, uprkos očekivanju da zemlje imaju svoje specifičnosti, koje utiču na uspeh poslovanja banaka (heterogenosti između jedinica posmatranja) koje pomoću metode FE, odnosno metode RE mogu biti kooptirane, vrednost testa o zajedničkom odsečku, odnosno Breusch-Pagan-ovog testa impliciraju da je za ocenu parametara modela najbolji ocenjivač tzv. Pooled OLS. Iz tog razloga u radu su napravljene ocene primenom tog ocenjivača. Rezultati ocene modela (1) primenom Pooled OLS prikazane su u tabeli 5.

Tabela 5 - Ocene parametara modela (1) dobijene primenom Pooled OLS metoda

Pooled OLS metod					
Varijable	Koeficijenti	St. greške	t-racio	p-vrednost	
konstanta	3,568	1.691	2.109	0.047	**
$gdp_{i,t}$	0,007	0.020	0.339	0.738	
$unr_{i,t}$	-0,033	0.029	-1.148	0.263	
$inf_{i,t}$	-0,067	0.053	-1.268	0.218	
$HHI_{i,t}$	-0,062	0.020	-3.172	0.004	***
$nlp_{i,t}$	-0,087	0.026	-3.291	0.003	***
$nimr_{i,t}$	0,104	0.067	1.559	0.133	
$cap_{i,t}$	0,081	0.036	2.243	0.035	**
$llp_{i,t}$	0,015	0.006	2.397	0.025	**
$R^2 = 0.757$					
Test normalnosti distribucije reziduala $x^2(2) = 0.717$ (0.698)					
Durbin-Watson = 0.698					

Napomena: ***, **, * označavaju nivo značajnosti od 1%, 5% i 10% redom.
Izvor: Autor

Analiza ocene parametara modela (1) prikazanih u tabeli 5 pokazuje da neto kamatna marža nema statistički značajan uticaj na uspeh poslovanja, što je suprotno očekivanjima. Analiza dalje implicira da uspeh poslovanja banaka u ispitanim zemljama zavisi od problematičnih kredita, stepena konkurencije na tržištu, ali i od stope adekvatnosti kapitala i stope rezervi za pokriće potencijalnih gubitaka. Dobijeni rezultati u skladu su sa nalazima brojnih autora. Za ostale determinante nije utvrđeno da imaju statistički značajan uticaj. Međutim, relativno niski koeficijent determinacija (R^2) upućuje na oprez prilikom prihvatanja rezultata. Naime, vrednost ovog pokazatelja adekvatnosti modela otkriva da nezavisne varijable koje su uključene u model samo oko 70% varijacija u ROA uspevaju da objasne. Ovo implicira da broj uključenih varijabli nije dovoljan, odnosno da postoje i ostale makroekonomske i mikroekonomske determinante koje utiču na uspeh poslovanja ovih banaka. Nažalost, dostupnost podataka predstavljalo je ozbiljno ograničenje ovog istraživanja, te iz tog razloga nije bilo moguće u model uključiti veći broj determinanti.

Zaključak

U radu se ispituje uticaj, u literaturi identifikovanih kao ključne makroekonomske i mikroekonomske determinante uspeha poslovanja banka. Istraživanje je sprovedeno na primeru banaka koje posluju u izabranim zemljama republikama bivše Jugoslavije: Republici Srbiji, Crnoj Gori, Bosni i Hercegovini i Republici Hrvatskoj. Period istraživanja pokriva od 2010. do 2020. godine. Pored uslova da su makroekonomske i mikroekonomske determinante identifikovane kao ključne u literaturi, kao i da po pitanju njihovog uticaja na uspeh poslovanja banka postoje oprečni nalazi, dostupnost podatka bila je ključna odrednica prilikom izbora determinanti koje su ušle u model.

Nalazi ovog istraživanja su delimično u skladu da apostrofiranim studijama. Posebno iznenađujući nalaz jeste otkriće da neto kamatna marža nema statistički značajan uticaj na uspeh poslovanja banaka, što je u suprotnosti sa očekivanjima i dominantnim nalazima velikog broja istraživanja.

Ključni nalaz ovog istraživanja jeste da stopa problematičnih kredita predstavlja najvažniju determinantu poslovanja banka u izabranim zemljama, kao i činjenica da pored analiziranih determinanti, uspeh poslovanja banaka u ovim zemljama određen je i ostalim faktorima poslovanja. Budućim istraživačima ostaje da otkriju koji su to faktori i ispitaju njihov uticaj.

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Tabela A1 - Choi meta test

Varijable	Choi meta test		
	Test	Vrednost	p-value
$ROA_{i,t}$	Inverse $x^2(8)$	19.736	0.011
	Inverse normal test	-2.740	0.003
	Logit test: t(24)	-2.736	0.005
$gdp_{i,t}$	Inverse $x^2(8)$	18.420	0.018
	Inverse normal test	-2.563	0.005
	Logit test: t(24)	-2.530	0.009
$unr_{i,t}$	Inverse $x^2(8)$	20.007	0.010
	Inverse normal test	-2.781	0.002
	Logit test: t(24)	-2.780	0.005
$inf_{i,t}$	Inverse $x^2(8)$	18.420	0.018
	Inverse normal test	-2.563	0.005
	Logit test: t(24)	-2.530	0.009
$HHI_{i,t}$	Inverse $x^2(8)$	18.622	0.017
	Inverse normal test	-2.591	0.004
	Logit test: t(24)	-2.562	0.008
$nlp_{i,t}$	Inverse $x^2(8)$	19.319	0.013
	Inverse normal test	-2.684	0.003
	Logit test: t(24)	-2.671	0.006
$nimr_{i,t}$	Inverse $x^2(8)$	19.319	0.013
	Inverse normal test	-2.865	0.002
	Logit test: t(24)	2.886	0.004
$cap_{i,t}$	Inverse $x^2(8)$	18.420	0.018
	Inverse normal test	-2.563	0.005
	Logit test: t(24)	-2.530	0.009
$llp_{i,t}$	Inverse $x^2(8)$	20.962	0.007
	Inverse normal test	-2.900	0.001
	Logit test: t(24)	-2.926	0.003

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DETERMINANTS OF BANK BUSINESS SUCCESS: A STUDY OF SELECTED CASES FROM FORMER YUGOSLAV COUNTRIES

Vesna Marić, PhD
Assistant – Belgrade Business and Arts Academy of Applied Studies
info@bpa.edu.rs

Prof. Svetlana Ignjatović
Tenured professor, Faculty of Economics and Engineering Management
projektna@fimek.edu.rs

Prof. Danijela Anđelković
Associate professor, University Business Academy in Novi Sad
danijela.andjelkovic@gmail.com

Abstract: The paper examines the determinants of bank business success by applying panel analysis to a sample of former Yugoslavia countries. The study spans the 2010-2020 period. This paper's primary goal is to find the most important factor influencing bank business success in former Yugoslavia using the proper panel analysis econometric model. The analysis's findings suggest that non-performing loans are the microeconomic component that has the biggest influence on bank business performance and that macroeconomic factors do not have a statistically significant impact on bank business success.

Keywords: bank business success; business determinants; macroeconomic factors; microeconomic factors; panel analysis; fixed effects method; random effects method

JEL classification: G21, C22, C52, C53

Introduction

Because of the importance of banks to the functioning of national economies and, more broadly, the stability of the international financial system, bank operations have been the subject of numerous papers and studies. A healthy banking system is widely recognized as a prerequisite for economic growth because it ensures macroeconomic stability, and liquid and profitable banks are the foundation of that stability (Ayadurai & Eskandari, 2018). As a result, the determinants of bank operations, particularly those affecting the rate of non-performing loans, the rise in moral hazard, and macroeconomic conditions, among other things, have remained a constant focus of the professional and academic public. However, despite the great interest in studying these factors, there is a dearth of works simultaneously focusing on exploring the influence of all the most significant macroeconomic and microeconomic factors determining the success of banks' operations. This is particularly evident in small developing financial markets. Due to the complexity of the banking system and bank operations, it is almost impossible to take all factors into account. Namely, the complexity of the banking industry makes the list of variables that affect their ability to succeed nearly endless, and it is reasonable to say that it grows greater every day The international financial market underwent structural changes in the final years of the 20th century, which led to the deregulation and internationalization of bank operations, as well as the explosive growth of the derivatives market. As a result, banks have increased their offerings of financial services and trading activities, but they have also intensified debt-creditor agreements with customers who have poor credit ratings (Radivojević, 2014). New financial instruments, techniques, strategies and financial engineering have also emerged as a result of technological advancements and regulatory liberalization in the banking industry. These have all led to an ongoing expansion of the factors influencing bank business success.

Considering that all of the aforementioned factors have essentially encouraged banks to expand their business operations by entering industries that were either not traditionally considered banking or were not dominant in their operations, on the one hand, but have also resulted in the increase of banks' credit risk due to the easing of screening criteria and procedures for bad loans, the primary focus of the academic public, in terms of studying the bank success factors, was on the non-performing loans' determinants. Such research was conducted by Makri & Papadatos (2012), Makri *et al.* (2014) Moinescu (2012), Louzis *et al.* (2012), Stakic (2014). Radivojević & Jovović (2017). They concur that the yield rate of bad loans is an important factor in the success of bank operations because it affects the illiquidity and profitability of banks, which in turn affects macroeconomic stability, even though they have reached different conclusions about the impact of specific macroeconomic or microeconomic factors on the rate of non-performing loans (Hassan *et al.* 2011). Macroeconomic determinants of bank business success were the subject of research conducted by Athanasoglou *et al.* (2006; 2008), Pasiourias & Kosmidou (2007), Albertazzi & Gambacorta (2009), Sufian & Habibullah (2009), Vong & Chan (2009), Rekik & Kalai (2018), Rupeika-Apoga *et al.* (2018), Borges & Tavares (2020), and others. Within this paradigm, we are able to distinguish between two research groups. Studies that have investigated the effects of so-called broad macroeconomic factors, such as gross domestic product (GDP), inflation, unemployment, prices, exchange rates, levels of economic activity, volume of imports and exports, etc., make up the first group. Demirgüç-Kunt & Huizinga (1999), Athanasoglou *et al.* (2006; 2008), Anbar & Alper (2011), and others conducted this type of study. Dr. Athanasoglou *et al.* (2006; 2008) have found that the gross domestic product (GDP) has a significant and positive impact on bank operations.

Contrary to them, the findings of Demirgüç-Kunt & Huizinga (1999), Pasiourias & Kosmidou (2007), Sufian & Habibullah (2009) and Vong & Chan (2009) imply the absence of a statistically significant relationship between bank business success and economic growth. This is explained by the fact that in circumstances when economic activities strengthen, investors acquire investment funds from other sources, such as retained earnings or by issuing securities so that banks are not their primary sources of fresh capital. The importance of studying this determinant of bank operations is reflected in the research findings of Beltratti & Stulz (2012), Erkens *et al.* (2012), Serrano-Cinca *et al.* (2014), Adebambo *et al.* (2015), Cox *et al.* (2017), as well as Avkiran *et al.* (2018), who studied the performance of banks during the global economic crisis. The findings of these studies indicate that not all banks were equally affected by the crisis and the decline in GDP, which implies that some other factors may have a significant impact on business success.

Macroeconomic determinants of bank business success were the subject of research conducted by Athanasoglou *et al.* (2006; 2008), Pasiourias & Kosmidou (2007), Albertazzi & Gambacorta (2009), Sufian & Habibullah (2009), Vong & Chan (2009), Rekik & Kalai (2018), Rupeika-Apoga *et al.* (2018), Borges & Tavares (2020) and others. We may differentiate two groups of research within this framework. The first group comprises studies that have explored the impact of the so-called general macroeconomic determinants, such as gross domestic product (GDP), inflation, unemployment, prices, exchange rate, level of economic activity, the volume of imports and exports, etc. Such research was carried out by Demirgüç-Kunt & Huizinga (1999), Athanasoglou *et al.* (2006; 2008), Anbar & Alper (2011), and others. Dr. Athanasoglou *et al.* (2006; 2008) have found that the gross domestic product (GDP) has a significant and positive impact on bank operations. Contrary to them, the findings of Demirgüç-Kunt & Huizinga (1999), Pasiourias & Kosmidou (2007), Sufian & Habibullah (2009), and Vong & Chan (2009) imply the absence of a statistically significant relationship between bank business success and economic growth. This is explained by the fact that in circumstances when economic activities strengthen, investors acquire investment funds from other sources, such as retained earnings or by issuing securities, so banks are not their primary sources of fresh capital. The importance of studying this determinant of bank operations is reflected in the research findings of Beltratti & Stulz (2012), Erkens *et al.* (2012), Serrano-Cinca *et al.* (2014), Adebambo *et al.* (2015), Cox *et al.* (2017), as well as Avkiran *et al.* (2018), who studied the performance of banks during the global economic crisis. The findings of these studies indicate that not all banks were equally affected by the crisis and the decline in GDP, which implies that some other factors may have a significant impact on business success.

There are numerous academic articles about inflation. We also come across contradictory findings regarding this macroeconomic determinant of bank operations, ranging from its having a positive influence (Pan & Pan (2014), Tan & Floros (2012), Andries *et al.* (2016)) or a negative influence (Abreu & Mendes (2002) Sufian & Habibullah (2009), Sufian (2010)), Moyo & Tursoy (2020), to those who point out that the impact of this determinant depends on how correctly banks are able to predict the movement of the inflation rate. Thus, according to Perry (1992), if banks are effective in forecasting the rate of inflation, they will be able to alter interest rates and thereby improve their financial results. Contrary to Cetin (2019), who discovered a positive impact of inflation on the ROA of banks in developing countries, Hamadi & Awdeh (2012) did not identify any relationship between this determinant and bank business success.

According to Horobet *et al.* (2021), who studied the general macroeconomic factors that influence the success of banks in Central and Eastern Europe, the unemployment rate has a detrimental effect on bank business success.

The second (sub)group consists of research studies that focus on particular macroeconomic elements, such as the country's political risk, government interventions, institutional support for the growth of the banking sector, etc. The impact of government measures and deregulation on bank business success was the subject of research by Beck *et al.* (2010), Boustanifar (2014), Zakaria *et al.* (2015), and others. They have found that banking deregulation makes room for the entry of foreign banks and also benefits other areas of the economy by lowering unemployment rates, improving capital allocation, etc. However, it is challenging to make a direct and precise inference about their influence on bank performance based on their research. Similar findings were presented by Isfaq & Khan (2015). In contrast, Daly & Frikha (2017) found that macroeconomic factors associated with government interventions negatively affect the results of bank operations. Onofrei *et al.* (2018) specifically mention non-governmental loans as a significant determinant of the success of bank operations. According to Borges and Tavares (2020), a market's bank concentration has a favorable effect on how well businesses function. Their findings are consistent with the results of the research conducted by Goddard *et al.* (2004), Bikker & Bos (2005), Kosmidou *et al.* (2005), Pasiourias & Kosmidou (2007), and Trujillo-Ponce (2013). Pastor *et al.* (2000) and Hermes & Lensink (2004) explain this by the fact that the increased bank concentration, which is mostly the result of large foreign banks entering minor and developing markets, motivates domestic banks to enhance their operations. According to the findings of their study, domestic banks had much lower rates of non-performing loans in developing markets after the introduction of foreign banks. Hermes & Lensink (2004) point out that the increase in the concentration of banks also implies the introduction of new services, which fosters competition among banks to create new services and enhance their business operations. However, on the other hand, Barajas *et al.* (2000) and Clarke *et al.* (2000) draw attention to the drawbacks. The findings that banks are compelled to invest more money in business improvement, leading to an increase in operating costs that cannot be adequately covered, explain this. According to Clarke *et al.* (2000), this situation arises when foreign banks have special comparative advantages over domestic ones.

Studies that examined the microeconomic factors that influence bank operations make up a sizable portion of another enormous body of study. Such research mostly concentrated on the effects of subprime loans, operating expenses, capital adequacy rate, quality of bank assets, management quality, and attitude toward risk, among other things. Authors such as Barros *et al.* (2007), Chiorazzo *et al.* (2008), García-Herrero *et al.* (2009) and others state that in spite of the higher operational costs of managing a large loan portfolio, bank profitability should increase due to the granting of more loans. However, the latest research by Christaria & Kurnia (2016), Anastasiou *et al.* (2016), Akter & Roy (2017), Kingu *et al.* (2018), Petkovski *et al.* (2018), Khan & Ahmad (2017) and Horobet *et al.* (2021) clearly indicates that the increase in non-performing loans negatively affects bank profitability. Horobet *et al.* (2021) indicate that bad loans are the most important determinant of bank business success. On the other hand, Psaila *et al.* (2019) research results show that it is the bank's solvency rate. Similar findings were presented by Staikouras & Wood (2004), Capraru & Ihnatov (2014), and Curak *et al.* (2012).

Recent years have witnessed an increasing focus not only on management quality but also on the quality of the entire board of directors (King *et al.* (2016), Fernandes *et al.* (2017), Pereira & Filipe (2018)). Accordingly, Pereira & Filipe (2018) discovered that the level of education in bank management plays a major role in predicting business performance. Wyród-Wróbel & Biesok (2017), as well as Tailab (2020), have discovered that bank business success in a crisis depends dominantly on the management's ability to set priorities at the strategic and operational level, a key determinant of success. Salas & Saurina (2002) and Espinoza & Prasad (2010) examined the quality of bank management through the net interest margin in their research on the factors that influence non-performing loans, highlighting that it serves as an excellent gauge of how well the bank chooses to make investments. The positive impact of the net interest margin on bank performance was also shown by KuKaj *et al.* (2020). Radivojević & Jovović (2017) point out that the capital adequacy rate is also an important indicator of the quality of bank management because it reflects the management's attitude towards risk, while Stakić (2014) indicates that these are provisions for potential losses. The allocation of larger reserves reduces profitability, but on the other hand, the liquidity of the bank is strengthened in the medium term, so it is difficult to assess the true impact of this factor on bank business success.

The importance of the concurrent study of macroeconomic and microeconomic factors in bank operations is best illustrated by the results of the research by Sufian *et al.* (2012) who imply that macroeconomic factors such as credit risk, margin size, operating costs, bank size, etc. have different significance depending on the macroeconomic context in which banks operate. Similar findings have been reported by Horobet *et al.* (2021). They discovered that the impact of the determinants depends more on the rate of development of the financial sector than it does on the research period by examining studies that investigated the macroeconomic and microeconomic drivers of bank operations. The impact of business determinants differs between developed and underdeveloped financial markets. Awareness that the effects of certain bank operations' determinants, such as the inflation rate and the concentration rate, differ in European developing countries compared to other developing markets (Mirzaei *et al.* (2013), García-Herrero *et al.* (2009), Demirgüç- Kunt & Huizinga (1999), Sufian (2009), Horobet *et al.* (2021)) emphasize the need to examine their impact, especially for groups of countries that have similar characteristics.

With the aforementioned information in mind, the objective of this paper is to investigate the effects of those macroeconomic business determinants, such as GDP, inflation, unemployment, the concentration of banks on the market, and the (in)stability of the political environment, on the success of banks operating in the former Yugoslav republics. Microeconomic factors that have been cited by several writers as being crucial include non-performing loans, solvency, and the caliber of bank management are also the focus of this study. The Republic of Serbia, Montenegro, Bosnia and Herzegovina, and the Republic of Croatia were the four former Yugoslav nations used as a sample for the study.

Data and Research Methodology

As already pointed out, the main objective of this study is to evaluate the impact of key macroeconomic and microeconomic determinants on the success of banks operating in the countries of former Yugoslavia: the Republic of Serbia, Montenegro, Bosnia and Herzegovina and Croatia. The study spans the years 2010 to 2020. The Federal Reserve Bank of Saint Louis, the World Bank, the Bank for International Settlements, and the Eurostat database's official websites were used to gather the data needed for the study. Panel analysis of unbalanced panel data is used to examine the impact of key determinants on bank business success. Key factors of bank business success are examined using panel analysis of unbalanced panel data. This method of analysis was used because it enables the co-optation of bank behaviour patterns as a unit of observation, over the course of the research period.

Taking into account the statements made by Chandler & Hanks (1996) and Curcic *et al.* (2020), it is not unexpected that most research studies on the factors influencing business performance define it in terms of profitability. Academic communities argue over which metric best represents a bank's performance when it comes to operations: ROA or ROE. It is ROA, according to authors like Krakah & Ameyaw (2010), because capital multipliers have no bearing on it. In contrast, proponents of ROE contend that off-balance sheet assets are a substantial source of profit. This is particularly clear in the way that European banks operate. Nevertheless, despite these drawbacks, ROA is used in this article to measure bank business success. However, despite its limitations, for the purpose of this paper, bank business success is expressed through ROA. This decision is consistent with the writings of Demirgüç-Kunt & Huizinga (1999), Athanasoglou *et al.* (2006), as well as Capraru & Ikhnatov (2014), Borgesa & Taverna (2020), and others.

According to the authors referenced in the introduction, the GDP rate, which has been turned into a logarithmic function and, as such, depicts GDP growth over time, is used in this research to express GDP for the purposes of this study. The success of the bank industry is anticipated to be positively impacted by the GDP growth rate. The inflation rate serves as a measure of inflation. It is anticipated that the inflation rate and bank business success will be negatively connected. While the concentration of banks in the market is indicated by the use of the concentration index, which varies from 0 to 100, unemployment is expressed through the unemployment growth rate and is also anticipated to negatively affect bank business success.

Indicators of macroeconomic stability are frequently used to indicate the (in)stability of the political environment, a complex setting that impacts all participants in economic activity. However, for the purposes of this article, the index of political risk is used instead. In other words, despite the low values of macroeconomic stability indicators, the findings of Papović *et al.* (2020) suggest that foreign investors frequently make specific investments because of favorable institutional backing, as an expression of the will of the people who created the political environment. This implies that additional signs of political risk must be considered when defining how banks operate. The *Political Stability Index* was chosen for the purposes of this article because of this.

The ratio of non-performing loans to the bank's total loans is used in this study as a measure of non-performing loans. The capital adequacy rate is used to convey this factor in determining business performance since it is a reliable indicator of the bank's solvency and has a strong correlation with leverage. The net margin rate and the rate of reserves to cover prospective losses were also included in the study along with these two variables as indicators of the management effectiveness and risk-taking mindset of the bank.

A higher rate of net margin is anticipated to have a favorable impact on bank business success, whereas a larger rate of reserves to cover probable losses is anticipated to have a negative impact.

An econometric model that can be presented as follows was created for this study's purposes:

$$ROA_{i,t} = \beta_1 + \beta_2 gdp_{i,t} + \beta_3 unr_{i,t} + \beta_4 inf_{i,t} + \beta_5 HHI_{i,t} + \beta_6 IPR_{i,t} + \beta_7 npl + \beta_8 nimr + \beta_9 cap + \beta_7 llp + \varepsilon_{i,t} \quad (1)$$

In that case:

$ROA_{i,t}$ - *Return on assets for country i in (t) time period*
$gdp_{i,t}$ - *Gross domestic product rate for country i in (t) time period*
$unr_{i,t}$ - *Unemployment rate for country i in (t) time period*
$inf_{i,t}$ - *Inflation rate for country i in (t) time period*
$HHI_{i,t}$ - *Herfindahl–Hirschman Index for country i in (t) time period*
$IPS_{i,t}$ - *Political stability index for country i in (t) time period*
$npl_{i,t}$ - *Net non-performing loan rate for country i in (t) time period*
$nimr_{i,t}$ - *et interest margin rate for country i in (t) time period*
$cap_{i,t}$ - *Capital adequacy ratio for country i in (t) time period*
$llp_{i,t}$ - *Rate of loan loss reserves*
$\varepsilon_{i,t}$ - *error of model*

Empirical Analysis and Discussion of the Results

The descriptive statistics results for the data set are displayed in Table 1. The ROA ranges from -4,342 to 2,308, which indicates a significant difference between banks' minimum and maximum profitability levels. The extremely high value of the ROA standard deviation further supports this. The negative value of the coefficient of asymmetry in combination with the very high value of the coefficient of kurtosis indicates a higher probability of getting negative business results in the future than positive ones. However, the variable's positive value shows that, on average, banks in these countries operated successfully during the observed period. A blatant indication of the disparities in economic development between these countries throughout the period observed is the big difference between the GDP's maximum and minimum values as well as its large standard deviation. Despite the fact that throughout the observed period all countries achieved GDP growth, the negative asymmetry coefficient value should raise some red flags. High unemployment rates indicate that these countries are facing a problem with unemployment, while, despite the wide variation between the minimum and maximum values of the inflation rate, the comparatively low average value of the *inf* variable shows that these countries did not experience severe inflation issues. However, the high values of the descriptive statistics for the concentration index indicate a high concentration, i.e. relatively low competition among banks, which is not good from the perspective of clients, but from the perspective of bank operations, it can represent a determinant that will have a positive sign, because a relatively small number of banks manage to achieve large market shares. Relatively low and even negative values of the political stability index imply an unstable macroeconomic environment, which can have a negative impact on banks' operations. The relatively high descriptive statistics values of problem loans point to a great potential in non-performing loans, which will have a negative impact on business success. Hence, this determinant is expected to have a detrimental impact on bank business success, despite the assertions made by Barros *et al.* (2007), Chiorazzo *et al.* (2008), and Garca-Herrero *et al.* (2009) that a rise in the loan portfolio will result in higher revenues for banks.

Relatively high values for *llp* and *cap* reveal the management's relative aversion to risk and tendencies towards a conservative business policy. A higher value of *llp* is expected to negatively affect bank business success due to the fact that a larger portion of the funds is frozen, and that the *cap* as a measure of solvency has a positive impact. Surprisingly, both the rate of net interest margins and the coefficient of asymmetry for this variable have negative values, suggesting that active interest rates may be lower than passive ones in the future.

Table 1 - Selected Variables' Descriptive Statistics

	$ROA_{i,t}$	$gdp_{i,t}$	$unr_{i,t}$	$inf_{i,t}$	$HHI_{i,t}$	$IPS_{i,t}$	$nlp_{i,t}$
mean	0.465	1.198	17.792	1.774	67.925	0.105	12.808
St. deviation	1.063	3.629	5.704	2.515	11.172	0.446	5.128
kurtosis	9.430	9.660	-0.432	4.008	-1.325	-0.727	-0.959
skewness	-2.359	-2.661	0.165	1.714	-0.046	-0.104	0.045
Minimum	-4.342	-15.307	6.620	-1.584	49.435	-0.900	3.700
Maximum	2.308	5.078	28.010	11.137	90.964	0.800	21.600
N. obs.	44	44	44	44	44	32	44
	$nimr_{i,t}$	$cap_{i,t}$	$llp_{i,t}$				
mean	4.710	14.227	75.172				
St. deviation	2.413	4.108	27.170				
kurtosis	9.663	-0.949	-0.755				
skewness	-2.125	0.355	0.621				
Minimum	-6.444	8.231	38.799				
Maximum	8.619	20.890	133.600				
N. obs.	44	44	44				

Source: Authors

A correlation study between the variables was conducted in order to find any potential multicollinearity issues. The correlation matrix is displayed in Table 2. Since there is a strong correlation between the *IPS* variable and the *HHI*, the *IPS* variable was left out of further analysis.

Table 2 - Correlation Matrix

	$ROA_{i,t}$	$gdp_{i,t}$	$unr_{i,t}$	$inf_{i,t}$	$HHI_{i,t}$	$IPS_{i,t}$	$nlp_{i,t}$	$nimr_{i,t}$	$cap_{i,t}$	$llp_{i,t}$
$ROA_{i,t}$	1.000									
$gdp_{i,t}$	0.195	1.000								
$unr_{i,t}$	-0.071	0.031	1.000							
$inf_{i,t}$	0.012	0.050	0.165	1.000						
$HHI_{i,t}$	-0.254	-0.134	-0.408	-0.246	1.000					
$IPS_{i,t}$	-0.249	0.010	-0.403	0.046	0.815	1.000				
$nlp_{i,t}$	-0.288	0.096	0.466	0.340	0.106	0.329	1.000			
$nimr_{i,t}$	-0.376	-0.051	0.016	-0.034	0.498	0.268	0.163	1.000		
$cap_{i,t}$	0.137	0.039	-0.057	0.423	-0.584	-0.185	0.122	-0.360	1.000	
$llp_{i,t}$	0.306	0.097	-0.031	-0.301	0.482	0.009	-0.093	0.246	-0.722	1.000

Source: Authors

A valid application of panel analysis implies that the data series exhibit the properties of stationarity. For this reason, the paper tested the presence of a unit root in panel data using the Levin–Lin–Chu (LLC) test. The findings in Table 3 show that the baseline levels of the *HHI*, cap and *llp* variables do not exhibit stationary behaviour. The results obtained suggest that the differentiation technique should be used to convert the series of these variables into stationary ones. Although it is usual practice to employ this type of test in macroeconomics and international finance (Choi, 2001), the LLC test's application in time series analysis is constrained by the assumption that all components have the same autoregression coefficient. For this reason, additional stationarity testing was carried out in this paper, using the KPSS test, a method that was suggested by Choi (2001) and is based on the so-called meta-analysis. The results are displayed in Table 1A of the paper's appendix. The variables were changed into stationary ones in light of these findings.

Table 3 - LLC Test Results

Variable		LLC test
$ROA_{i,t}$	Level	0,0240
	1. Differential	-
$gdp_{i,t}$	Level	0,0101
	1. Differential	-
$unr_{i,t}$	Level	0,0001
	1. Differential	-
$inf_{i,t}$	Level	0,0003
	1. Differential	-
$HHI_{i,t}$	Level	0,621
	1. Differential	0,000***
$nlp_{i,t}$	Level	0,018
	1. Differential	-
$nimr_{i,t}$	Level	0,002
	1. Differential	
$cap_{i,t}$	Level	0,141
	1. Differential	0,000***
$llp_{i,t}$	Level	0,844
	1. Differential	0,000***

Source: Authors

The fixed effects (FE) and random effects (RE) methods were employed to assess the model's parameters using two-panel data evaluators (1). Table 4 displays the outcomes of the model parameter evaluation.

Table 4 - Estimates of Model Parameters (1)

FE method					
Variable	Coefficient	St. error	t-ratio	p-value	
const.	3,022	3,893	0,776	0,447	
$gdp_{i,t}$	0,001	0,024	0,034	0,974	
$unr_{i,t}$	-0,013	0,049	-0,256	0,801	
$inf_{i,t}$	-0,041	0,068	-0,600	0,556	
$HHI_{i,t}$	-0,053	0,035	-1,526	0,143	
$nlp_{i,t}$	-0,094	0,034	-2,785	0,012	**
$nimr_{i,t}$	0,168	0,112	1,497	0,151	
$cap_{i,t}$	-0,048	0,167	-0,290	0,775	
$llp_{i,t}$	0,031	0,028	1,115	0,279	
Joint test on named regressors P(F(9, 19) > 6.388) = 0.000					
Test for differing group intercepts P(F(3, 19) > 0.427) = 0.735					
LSDV R^2 = 0.773					
Within R^2 = 0,751					
Test of normality distribution of residuals: $x^2(2)$ = 1.312 (0.518)					
Durbin-Watson = 2.513					
RE method					
Variable	Coefficient	St. error	t-ratio	p-value	
konstanta	3,040	3,446	0,882	0,37	
$gdp_{i,t}$	0,006	0,021	0,265	0,791	
$unr_{i,t}$	-0,030	0,038	-0,799	0,425	
$inf_{i,t}$	-0,054	0,061	-0,879	0,380	
$HHI_{i,t}$	-0,052	0,030	-1,742	0,081	**
$nlp_{i,t}$	-0,091	0,030	-2,980	0,003	***
$nimr_{i,t}$	0,142	0,098	1,451	0,147	
$cap_{i,t}$	0,034	0,116	0,294	0,769	
$llp_{i,t}$	0,020	0,020	0,995	0,320	
Joint test on named regressors: $x^2(9)$ = 63.632 (0.000)					
Breusch-Pagan test: $x^2(1)$ = 2.250 (0.133)					
Hausman test: $x^2(3)$ = 1.134 (0.768)					
R^2 = 0.510					
Test of normality distribution of residuals $x^2(2)$ = 3.317 (0.190)					
Durbin-Watson = 2.513					

Note: ***, **, * indicate significance level of 1%, 5% and 10% respectively.
Source: Authors

The results of the joint test of the selected regressors indicate that both models are correctly specified, that is, the right regressors have been chosen. Since there is no uniquely accurate way of calculating the coefficient of determination when it comes to the FE model, the LSDV coefficient of determination was calculated in the paper, as well as the so-called "within" coefficient of determination. According to the values of the two coefficients, the model's chosen variables may account for more than 70% of the variation in the dependent variable. The test of normality of the distribution of residuals and the autocorrelation of residuals of the FE model both indicate the adequacy of the model. The value of Hausman's test, however, suggests that the RE approach is superior to the FE method for evaluating model parameters. On the other hand, the RE model has a significantly lower coefficient of determination (R^2 = 0.510). The test for normality in the residual distribution and the autocorrelation of the residuals in the RE model indicate that the model is adequate.

Estimates of model parameters (1) derived by applying both methodologies indicate that the rate of non-performing loans is a key factor in business success. With each 1% increase in this rate, bank profitability will decline by about 0.09%. This finding is consistent with the findings of Christaria & Kurnia (2016), Anastasiou *et al.* (2016), Akter & Roy (2017) Kingu *et al.* (2018), Petkovski *et al.* (2018) and Khan & Ahmad (2017). The findings from this paper support the view of Horobet *et al.* (2021) that problem loans are the most important determinant of bank business success since the estimates of model parameters (1) demonstrate that cap is not a statistically significant variable, implying that solvency, which Psaila *et al.* (2019) claim to be a more significant determinant in relation to the rate of non-performing loans is not so. According to the analysis of the model parameter estimate (1), concentration plays a significant role in predicting bank business success. The fact that the coefficient for the *HHI* variable is negative suggests that any rise in bank competition, or decrease in concentration, has a positive effect on bank operations. This can be explained by the fact that new competitors force banks to invest more in improving business efficiency. This finding is consistent with the findings of Clarke *et al.* (2000), even though they explain the reasons for the negative impact of increased concentration in the fact that the entry of large, foreign banks into the domestic market forces domestic banks to invest more in enhancing their services, which significantly increases their operating costs.

The analysis revealed that other determinants have little influence on how successfully banks operate. This result is not unexpected in the context of macroeconomic determinants, as studies have shown that certain macroeconomic determinants did not, despite predictions, have a statistically significant impact. This is particularly evident when considering how inflation, unemployment, and economic growth affect the economy. It is surprising, nonetheless, that the research showed that the net interest margin does not have a statistically significant impact on how well banks operate. This may imply that banks implemented bad investment policies in the previous period, that is, that they generated significant income through activities that are not traditionally banking-dominant. The reason for this result may also be attributed to the model's flaws. Namely, despite the expectation that countries have their own specificities that affect bank business success (heterogeneity between observation units) that can be co-opted using the FE method, or the RE method, the value of the common segment test, i.e. the Breusch-Pagan test, implies that for evaluating the parameters of the model, the best evaluator is the so-called Pooled OLS. For this reason, the evaluations were made using that evaluator. Table 5 displays the results of the model estimation (1) using Pooled OLS.

Table 5 - Estimates of Model Parameters (1) Obtained by Applying the Pooled OLS Method

Pooled OLS method					
Variable	Coefficient	St. error	t-racio	p-value	
konstanta	3,568	1.691	2.109	0.047	**
$gdp_{i,t}$	0,007	0.020	0.339	0.738	
$unr_{i,t}$	-0,033	0.029	-1.148	0.263	
$inf_{i,t}$	-0,067	0.053	-1.268	0.218	
$HHI_{i,t}$	-0,062	0.020	-3.172	0.004	***
$nlp_{i,t}$	-0,087	0.026	-3.291	0.003	***
$nimr_{i,t}$	0,104	0.067	1.559	0.133	
$cap_{i,t}$	0,081	0.036	2.243	0.035	**
$llp_{i,t}$	0,015	0.006	2.397	0.025	**
$R^2 = 0.757$					
Test of normality distribution of residuals $x^2(2) = 0.717$ (0.698)					
Durbin-Watson = 0.698					

Note: ***, **, * indicate significance level of 1%, 5% and 10% respectively.
Source: Authors

Contrary to expectations, the study of the estimate of the model parameters (1) shown in table 5 indicates that the net interest margin does not have a statistically significant effect on business success. The analysis further implies that bank business success in the surveyed countries depends on problem loans, the level of market competition, as well as the capital adequacy rate, and the rate of reserves to cover potential losses. The results obtained are consistent with the findings of numerous authors. The other determinants were not found to have a statistically significant influence.
The relatively low coefficient of determination (R^2), however, suggests caution in terms of the findings. Namely, the value of this model adequacy indicator reveals that the independent variables included in the model manage to account for only about 70% of the variation in ROA. This suggests that there are additional macroeconomic and microeconomic factors that influence the success of these banks' operations and that the number of variables included is insufficient. Unfortunately, the availability of data was a serious limitation in this research, and for that reason, it was not possible to include a larger number of determinants in the model.

Conclusion

This paper examines the impact of those macroeconomic and microeconomic determinants of bank business success that were identified in literature as the key ones. The research was conducted on a sample of banks operating in the selected countries of the republics of former Yugoslavia: The Republic of Serbia, Montenegro, Bosnia and Herzegovina, and the Republic of Croatia. The study spans the period from 2010 to 2020. In addition to the requirement that macroeconomic and microeconomic determinants are identified as key in the literature and that there are conflicting findings regarding their influence on bank business success, the availability of data was a key factor when choosing the determinants that entered the model.

The findings of this research are partially consistent with the apostrophized studies. Contrary to expectations and the dominant findings of a large number of studies, a particularly surprising finding is the discovery that the net interest margin does not have a statistically significant effect on bank business success. The key finding of this study is that the rate of non-performing loans is the most important determinant of bank operations in the selected countries, as well as the fact that in addition to the determinants that were examined, there are other factors that also play a role in bank business success in these countries. It remains for future researchers to discover what these factors are and analyze their effects.

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Tabela A1 - Choi meta test

Varijable	Choi meta test		
	Test		p-value
$ROA_{i,t}$	Inverse $x^2(8)$	19.736	0.011
	Inverse normal test	-2.740	0.003
	Logit test: t(24)	-2.736	0.005
$gdp_{i,t}$	Inverse $x^2(8)$	18.420	0.018
	Inverse normal test	-2.563	0.005
	Logit test: t(24)	-2.530	0.009
$unr_{i,t}$	Inverse $x^2(8)$	20.007	0.010
	Inverse normal test	-2.781	0.002
	Logit test: t(24)	-2.780	0.005
$inf_{i,t}$	Inverse $x^2(8)$	18.420	0.018
	Inverse normal test	-2.563	0.005
	Logit test: t(24)	-2.530	0.009
$HHI_{i,t}$	Inverse $x^2(8)$	18.622	0.017
	Inverse normal test	-2.591	0.004
	Logit test: t(24)	-2.562	0.008
$nlp_{i,t}$	Inverse $x^2(8)$	19.319	0.013
	Inverse normal test	-2.684	0.003
	Logit test: t(24)	-2.671	0.006
$nimr_{i,t}$	Inverse $x^2(8)$	19.319	0.013
	Inverse normal test	-2.865	0.002
	Logit test: t(24)	2.886	0.004
$cap_{i,t}$	Inverse $x^2(8)$	18.420	0.018
	Inverse normal test	-2.563	0.005
	Logit test: t(24)	-2.530	0.009
$llp_{i,t}$	Inverse $x^2(8)$	20.962	0.007
	Inverse normal test	-2.900	0.001
	Logit test: t(24)	-2.926	0.003

Source: Authors