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IMPLIKACIJE PO FINANSIJSKU STABILNOST SA TRŽIŠTA KRIPTO-AKTIVE

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„Tržište kripto-aktive se brzo razvija i moglo bi da dođe do tačke u kojoj predstavlja pretnju globalnoj finansijskoj stabilnosti zbog svog obima, strukturne ranjivosti i sve veće povezanosti sa tradicionalnim finansijskim sistemom."

Odbor za finansijsku stabilnost, 16. februar 2022. god.

Rezime: Kripto-aktiva predstavlja deo digitalnih finansija koja je razvijena sa nastojanjem da se smanji upotreba gotovinskih sredstava plaćanja i da se poveća finansijska inkluzija. Značajan rast tržišne kapitalizacije kripto-aktive, uz porast broja različitih instrumenata kripto-aktive i volatilnosti njihove cene doveo je do zabrinutosti za očuvanje finansijske stabilnosti, koja predstavlja, pored cenovne stabilnosti, glavne ciljeve centralnih banaka. Platforme trgovanja kripto-aktive funkcionišu van nacionalnih jurisdikcija, što potencijalno može stvoriti koncentraciju rizika i ukazuje na nedostatak transparentnosti poslovanja. Brži razvoj tržišta kripto-aktive ukazuje na potrebu striktne regulacije tog dela tržišta, prikupljanje podataka kako bi se efikasno pratile transakcije, kao i zaštita korisnika i investitora. Regulativa tržišta kripto-aktive treba da obezbedi sigurnost svim učesnicima, nesmetano funkcionisanje finansijskog tržišta i očuvanje finansijske stabilnosti.

Ključne reči: kripto-aktiva, finansijska stabilnost, digitalizacija, regulativa

JEL klasifikacija: G11, E63

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Uvod

Upotreba savremenih tehnologija ima sve značajniju ulogu na globalnom finansijskom tržištu. Nakon svetske ekonomske krize, a naročito tokom pandemije virusa korone, kada su na snazi bile mere zatvaranja zemalja, razvijeni su savremeni oblici plaćanja koji se baziraju na različitim oblicima digitalne finansijske aktive. Investitori danas pored ulaganja u valute, plemenite metale, akcije i obveznice imaju mogućnost da diversifikuju svoj portfolio ulaganjem u kripto-aktivu. Od samog početka emitovanja kripto-aktiva beleži značajnu volatilnost u kretanju cena, visoke nivoe tržišne kapitalizacije i stvaraju potencijalno visok nivo rizika po postizanje i očuvanje stabilnosti finansijskog sistema. U ovom radu analiziraćemo implikacije po finansijsku stabilnost sa tržišta kripto-aktive gde ćemo u prvom delu prikazati pregled literature, nakon čega će uslediti sagledavanje karakteristika kripto-aktive. Treći deo rada je usmeren ka analizi regulatornog okvira kripto-aktive, dok se četvrti bavi sagledavanjem rizika po finansijsku stabilnosti koji dolaze sa tog dela finansijskog tržišta. U zaključku smo sumirali glavne zaključke ovog rada.

Pregled literature

Danas je od presudnog značaja primena digitalnih oblika plaćanja koja su uvedena sa nastojanjem da se postigne veći nivo finansijske inkluzije. Ovakav pristup ima svoje opravdanje imajući u vidu da se smatra da upravo finansijska inkluzija može da dovede do dodatnog ekonomskog rasta i razvoja, kao i društvenog blagostanja. Jedan od digitalnih oblika plaćanja predstavljaju različiti instrumenti tržišta kripto-aktive. Njihovim razvojem stvorene su velike mogućnosti, ali i izazovi za globalni finansijski sistem. Potrebno je ukazati da tržište kripto-aktive može da prouzrokuje značajne rizike po finansijsku stabilnost ukoliko međusobna povezanost sa institucijama tradicionalnog finansijskog sistema (poput banaka, lizing kompanija, osiguravajućih kuća) ne bude regulisana i nadzirana na adekvatan način. Posledično tradicionalan finansijski sistem može da zabeleži visoke gubitke u poslovanju, smanjeno poverenja investitora, ugroženost dobre reputacije poslovanja, ali i visoku izloženost kreditnom riziku i riziku likvidnosti. Upravo ta međusobna povezanost učesnika na finansijskom tržištu može da stvori efekat lanca koji podrazumeva da ako se desi nestabilnost kod jednog učesnika ona se može lako preneti na druge učesnike u sistemu. Time se nestabilnost finansijskog sistema jedne zemlje može preneti na druge zemlje i destabilizovati njihov finansijski sistem porastom sistemskog rizika. Upravo negativan uticaj digitalnih finansija može da prouzrokuje porast sistemskog rizika, koji možemo definisati kao finansijski rizik koji može da pogodi celokupan finansijski sistem, a ne samo pojedinačne institucije (Risman et al., 2021). Koliko uticaj sistemskog rizika može biti veliki najbolje se ogleda u tome da je upravo sistemski rizik imao najveći doprinos finansijskoj krizi iz 2008. godine.

Ne postoji standardna definicija šta zapravo predstavlja finansijska stabilnost ili stabilnost finansijskog sistema. Svetska banka (2020) ukazuje da postoje brojne definicije finansijske stabilnosti i za većinu njih zajedničko je to što se pod pojmom finansijske stabilnosti podrazumeva odsustvo epizoda stresa u kojima finansijski sistem ne ume da funkcioniše, što dovodi do pojave kriza. Takođe, pojam finansijske stabilnosti se odnosi na otpornost finansijskog sistema na prisustvo stresa.

U pogledu glavnih rizika po finansijsku stabilnosti, koji mogu biti prouzrokovani sa tržišta kripto-aktive, Bains et al., (2022) ukazuju na međusobnu povezanost sa svim učesnicima finansijskog sistema, valutnu supstituciju, potom ističu da pružaoci usluga sa tržišta kripto-aktive mogu da generišu značajan nivo sistemskog rizika, zatim ti pružaoci obavljaju veći broj aktivnosti na tom tržištu, a istaknuti su i tržišni rizik i rizik treće strane. Odgovor regulatora na prethodno navedene rizike treba da bude usmeren ka tome da se aktivno prati izloženost svih učesnika finansijskog sistema prema tržištu kripto-aktive, ograničenje u pogledu mogućeg ulaganja u instrumente tog tržišta, potom potrebno je uspostaviti saradnju na globalnom nivou i uspostaviti pokrića za svaku izloženost tim instrumentima. Finansijski regulatori nastoje da odgovore na različite rizike koje mogu da izazovu instrumenti sa tržišta kripto-aktive jer se ti rizike odnose na finansijska tržišta i sisteme. Tu se pre svega misli na finansijsku stabilnost, zaštitu investitora, očuvanje tržišnog integriteta i tržišnu efikasnost (Zetzsche et al., 2020).

Ono što razlikuje instrumente tržišta kripto-aktive je to što za njihovo emitovanje i trgovanje postoji značajno drugačiji set ograničenja nego što je slučaj kod tradicionalnih finansijskih instrumenata. Kripto-aktiva nije pod nacionalnom regulativom, za razliku od tradicionalnih finansijskih instrumenata koji su pod kontrolom vlade i centralne banke i podležu odredbama fiskalne i monetarne politike. Potom kripto-aktiva se bazira na digitalnoj i bezgraničnoj ekonomiji koja funkcioniše bez posrednika. Ovakav pristup izvršenja transakcija u značajnoj meri otežava primenu tradicionalnih regulatornih politika i strategija za kontrolu kripto-aktive (Elliott i De Lima, 2018). Da bismo na pravilan način razumeli različite motive koji stoje iza odluke ulaganja u kripto-aktivu neophodno je da se izvrši adekvatno sagledavanje tih transakcija. Otvorena distribuirana knjiga (eng. open distributed ledgers) daje svakome mogućnost da sagleda celokupan istorijat podataka o svakoj pojedinačnoj transakciji pri čemu je zbog postojanja pseudonima teško povezati svaki otvoren račun trgovanja sa pojedinačnim licima ili preduzećima (Feyen et al., 2022).

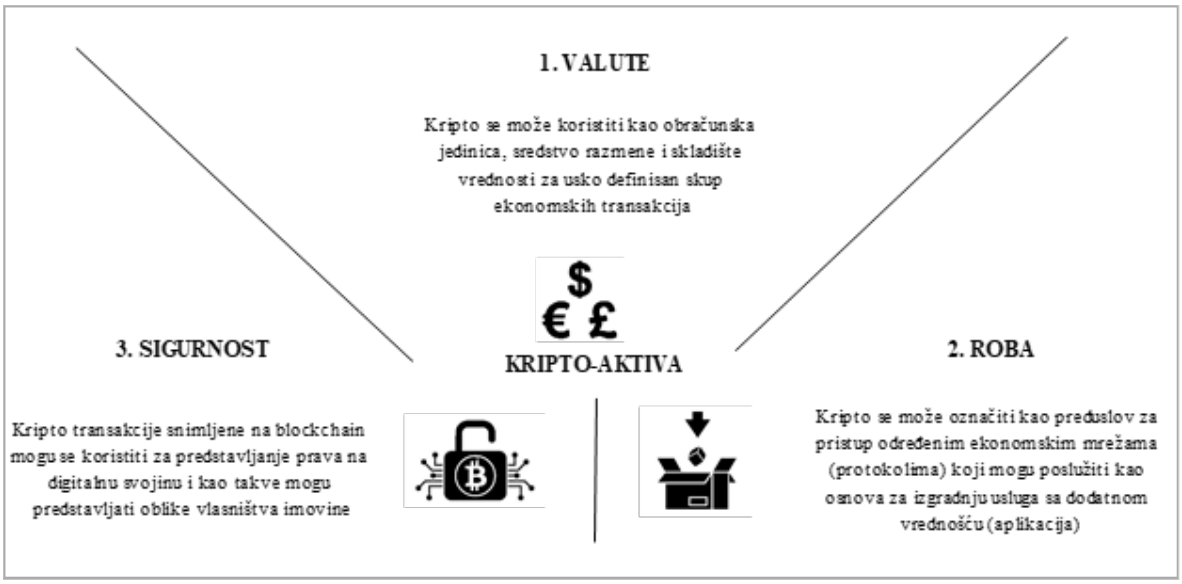
Pored značajnih rizika sa tržišta kripto-aktive potrebno je ukazati i na njihove prednosti. Kripto-aktiva je doprinela značajnoj transformaciji tradicionalnog globalnog finansijskog sistema sa ciljem efikasnijeg izvršenja transakcija, poboljšanja finansijske inkluzije i smanjenje sistemskog rizika u slučaju da je primenjena adekvatna regulativa. Nedavna pandemija virusa korone istakla je prednosti kripto-aktive, jer je ljudima bilo omogućeno da izvrše finansijske transakcije na daljinu i doprinela je smanjenju transakcionih troškova (Ozili, 2023). Dobar regulatorni okvir treba da uspostavi balans između obezbeđivanja zaštite klijenata i investitora, uz pružanje dovoljno podstreka za dalje inovacije na tržištu kripto-aktive kako se ne bi smanjio rast i razvoj tog dela tržišta. Takođe, od podjednakog značaja su i pravilno definisana uputstva kako bi svi učesnici na propisan način primenili regulativu koja treba da obuhvati sve rizike koji mogu da poteknu od tržišta kripto-aktive (Bakken, 2022).

Karakteristike kripto-aktive

Kripto-aktiva je transformisala tradicionalno finansijsko tržište jer se može koristiti kao sredstvo razmene koje se generiše, čuva i transferiše elektronski. Od samog nastanka kripto-aktiva je bila podložna značajnoj volatilnosti u kretanju cena. Time se često kripto-aktiva sa aspekta investitora i regulatora smatra spekulativnim instrumentom (Garcia-Singh, Thomas i Persad, 2021). U praksi svet kripto-aktive se suočava sa hiljadama inovacija svakog meseca, kao i sa emitovanjem novih proizvoda koji su bazirani na kombinaciji kripto tehnologije i tehnologiji distribuirane knjige (Demertzis i Wolff, 2018). U 2008. godini došlo je značajnog rasta obima trgovanja na tržištu kripto-aktive usled pojave bitkoina kao najprepoznatljivije kripto valute. Tada je pod pseudonimom Satoshi Nakamoto objavio rad koji se bavi analizom dizajna elektronskog platnog sistema kroz razvoj nove i revolucionarne blokčejn tehnologije. Do danas nije se saznalo da li se taj pseudonim odnosi na pojedinca ili na grupu ljudi (Martin, 2021).

Evolucija kripto-aktive ukazuje na podjednaku prisutnost mogućnosti, ali i rizika. Primarno, kripto-aktiva je razvijena sa nastojanjem da se izvrši razvoj decentralizovanog oblika plaćanja, ali i nastojanje da se pojavi instrument koji će biti u mogućnosti da izvrši zaštitu od inflacije i depresijacije valuta. Razvoj novih tehnologija, na kojima se bazira kripto-aktiva, uz primenu adekvatne regulacije može da stvori dodatne instrumente u odnosu na one koje nudi tradicionalni finansijski sistem. U pogledu definicije Odbor za finansijsku stabilnost kripto-aktivu definiše kao privatnu aktivu koja primarno zavisi od kriptografije i distribuirane knjige ili slične tehnologije kao deo njihove percipirane ili inherentne vrednosti (FSB, 2018). Ovako definisana kripto-aktiva ne može da se uklopi u definiciju konvencionalnih oblika aktive. Ipak, potrebno je ukazati da različite vrste kripto-aktive mogu da imaju osobine valute, roba ili hartija od vrednosti – Slika 1.

Slika 1: Karakteristike kripto-aktive



Izvor: Elliott, D. i De Lima L. (2018). Crypto-assets: their future and regulation, Oliver Wyman, str. 8

Veliki broj kripto-aktive ima tendenciju da beleži visoku volatilnost cene, što ih čini lošim sredstvima za očuvanje vrednosti i jedinica vrednosti. Ukoliko se sagledaju podaci na globalnom nivou ne postoji jedinstvena taksonomija kripto-aktive. Analiza Bains et al., (2022) ukazuje na četiri kategorije kripto-aktive koja je prihvaćena od strane dugih regulatora poput Banke za međunarodna poravnanja – Tabela 1. Prva kategorija se odnosi na unbacked kripto-aktivu koja je prenosiva, bazirana je na decentralizovanom načinu saldiranja transakcija i prvenstveno je dizajnirana da se koristi kao sredstvo razmene. Najveći deo ove vrste kripto-aktive se koristi za spekulaciju i kao primer se može označiti bitkoin. Uslužni tokeni (eng. utility token) predstavljaju drugu kategoriju i odnose se na tokene gde imaoci ovih tokena imaju pristup postojećem ili potencijalnom proizvodu ili usluzi. U okviru ove kategorije nalazi se tokenizovana kartica za kupovinu u određenoj prodavnici. Treća kategorija se odnosi na bezbednosne tokene (eng. security tokens) koji imaocu omogućava prava kakva imaju imaoci hartija od vrednosti (na primer pravo da dele profit emitenta hartije od vrednosti). Stablecoins se odnose na četvrtu kategoriju kripto-aktive koja u svojoj osnovi imaju stabilnu vrednost aktive na kojoj se zasniva poput jedne aktive ili korpe aktive (na primer konkretna valuta, plemeniti metal). Primeri stablecoins-a su Tether, Binance USD i USD Coin. Prema analizi Bullmann et al., (2019) stablecoins predstavljaju digitalnu jedinicu vrednosti koji ne predstavljaju nijednu specifičnu valutu (ili korpu valuta), ali njihova vrednost se bazira na stabilizovanim instrumentima kako bi se minimalizovale fluktuacija cena tih valuta. U okviru stablecoins-a razlikujemo nekoliko vrsta: (1) fiat-backed – odnosi se na stablecoins koji ima direktnu vezu da postojećim finansijskim sistemom kroz posedovanje tradicionalnih finansijskih instrumenata; (2) crypto-backed – predstavlja mehanizam stabilizacije cena koji je podržan rezervom kripto-aktive koji mogu da uključe unbacked kripto-aktivu kao i druge vrste stablecoins-a. Pošto je unbacked kripto-aktiva najčešće volatilna, crypto-backed stablecoins imaju značajno veći nivo obezbeđenja kako bi se obezbedila zaštita u slučaju pada vrednosti kolaterala. Ova vrsta stablecoins-a često ima mehanizam za likvidiranje kolaterala kripto-aktive ukoliko vrednost kolaterala padne ispod određenog praga, čime se obezbeđuje da stablecoins zadrži solventnost i (3) algoritamski stablecoins –vrsta stablecoins-a koja svoju vrednost nije zasnovala na nekoj rezervnoj aktivi. Ova vrsta stablecoins-a nastoji da ostvari cenovnu stabilnost kroz algoritam koji regulišu odnos ponude i tražnje stablecoins-a (MacDonald i Zhao, 2022).

Pored navedenih kategorija kripto-aktive važno je istaći i digitalne valute centralnih banaka koje, prema definiciji Sistema federalnih rezervi, predstavljaju digitalnu obavezu centralne banke koja je dostupna široj javnosti. Time digitalne valute centralnih banaka (eng. central bank digital currencies – CBDC) omogućavaju digitalna plaćanja. Centralne banke na globalnom nivou aktivno rade na razvoju svojih digitalnih valuta: Evropska centralna banka na uvođenju digitalnog evra, Sistem federalnih rezervi na digitalnom dolaru i Banka Engleske na digitalnoj funti. Te valute bi bile pod kontrolom centralne banke koja bi bila njen emitent, čime bi se stvorio dodatni oblik plaćanja, pored gotovinskog i bezgotovinskog oblika plaćanja (Martin, 2021). Od ključnog je značaja da centralne banke razumeju implikacije uvođenja digitalnih valuta centralnih banaka za finansijsku stabilnost i monetarnu politiku. Takođe, digitalne valute centralnih banaka ne smeju da budu izvor finansijske nestabilnosti koji može da poremeti transmisioni mehanizam monetarne politike (Panetta, 2022). NTF tokeni (eng. non-fungible tokens) ili nezamenljivi tokeni predstavljaju specijalnu vrstu kripto-aktive u kojoj je svaki token jedinstven za razliku od zamenljivih tokena gde svaki ima istu vrednost. Pošto su nezamenljivi tokeni jedinstveni mogu se koristiti za identifikaciju vlasništva na digitalnom aktivom kao što su umetnička dela, snimci ili virtualne nekretnine.

Tabela 1: Taksonomija kripto aktive, NFT i digitalne valute centralnih banaka

NFT tokeni	Bezbednosni tokeni	Uslužni tokeni	Unbacked kripto-aktiva	Stablecoins	Digitalne valute centralnih banaka
-Obično se izdaje centralno -Pravo na vlasništvo nad određenim proizvodom -Kolekcionarski i nezamenljivi	-Izdaje se centralno -Zadovoljava definiciju hartije od vrednosti u svakoj nadležnoj jurisdikciji -U okviru regulatornog perimetra	-Izdaje se centralno -Pravo na proizvod/uslugu -Prihvaćen višestruki ekosistem -Prenosiv -Može se koristiti kao sredstvo razmene	-Obično decentralizovan -Dizajniran da se koristi kao sredstvo razmene -Ograničena prava za vlasnika tokena -Nema pojedinačnog emitenta protiv koga bi se izvršilo pravo -Prenosiv	-Dizajniran da ima stabilnu vrednost -Mehanizam stabilnosti može biti podrška ili kolateralizacija sa robom, fiat valutom, više valuta, kripto sredstvima algoritama	-Izdaje centralne banke -Dizajniran da ima stabilnu vrednost -Mehanizam stabilnosti je obično suverena fiat valuta

Izvor: Bains, P., Ismail, A., Melo, F. and Sugimoto , N. (2022). Regulating the Crypto Ecosystem: The Case of Unbacked Crypto Assets, International Monetary Fund, FinTech Notes No 2022/007, str. 12

Postoji nekoliko faktora koji mogu uticati na porast korišćenja kripto-aktive. Nestabilna makroekonomska situacija u kombinaciji sa neefikasnim platnim sistemom u pojedinim zemljama u razvoju i razvijenim zemljama može da podstakne primenu kripto-aktive. Nizak nivo kredibiliteta centralne banke može da poveća supstituciju aktive jer domaći rezidenti mogu da traže sigurno utočište za očuvanje vrednosti svoje aktive. Ovo je naročito prisutno kod zemalja koje imaju visok nivo dolarizacije. Postojanje kripto sistema može doprineti domaćim rezidentima da konvertuju svoju aktivu u različite vrste instrumenata kripto-aktive. Sledeći faktor koji može da podstakne veće korišćenje kripto-aktive je neefikasan platni sistem i ograničen pristup finansijskim uslugama. Jedan primer predstavlja nedostatak kompatibilnosti između različitih domaćih platnih sistema, što može da stvori problem za priliv doznaka. Pošto kod pojedinih zemalja u razvoju postoji veliko učešće stanovništva koji nemaju otvoren račun u banci dešava se da se doznake šalju gotovinskim putem, poput pošti i drugih operatera prenosa sredstava. U slučaju korišćenja kripto-aktive priliv doznaka može da bude brži i jeftiniji, naročito putem stablecoins-a koji predstavlja stabilnu jedinicu obračuna. Naravno ovakav pristup zahteva pristup internetu i drugim tehnologijama, koje nisu dostupne mnogim zemljama. Treba imati u vidu da se u slučaju upotrebe kripto-aktive za priliv doznaka to može održati u kratkom roku (tokom perioda priliva doznaka), nakon čega primaoci mogu ino priliv da konvertuju u domaću valutu i vrše kupovinu na domaćem tržištu.

Upotreba kripto-aktive može uticati na potencijalne rizike po fiskalnu politiku putem utaje poreza, uz mogući pad prihoda od senioraže usled manjeg prisustva gotovine u opticaju. Ukoliko se desi veća tražnja za kripto-aktivom posledično može doći do odliva kapitala što utiče na devizno tržište. U tom slučaju potrebno je primeniti mere upravljanja kapitalom i druge mere koje se odnose na kripto-aktivu kako bi se postigla tržišna segmentacija (GFSR, 2021).

Regulatorni okvir kripto-aktive

Vodeću ulogu pri donošenju regulativnog okvira za kripto-aktivu imaju centralne banke, nadzorna i regulatorna tela i druga vladina tela. Prve reakcije na potencijalne rizike sa tržišta kripto-aktive su objavile centralne banke publikacijom saopštenja i upozorenja i nakon što su bitkoin i druge kripto valute dobile na svom razvoju. Prema Cuervo, Morozova i Sugimoto (2019) na polju donošenja regulatornog okvira kripto-aktive do sada je urađeno sledeće: (1) objava upozorenja – većina regulatornih tela, poput Komisije u hartije od vrednosti u Sjedinjenim Američkim Državama i Uprave za kontrolu i nadzor finansijskog sektora u Ujedinjenom Kraljevstvu, su objavile saopštenja kojima su upozorili na rizike kripto-aktive; (2) objava zabrana – nekoliko regulatornih tela je odlučilo da uvede zabranu bilo kakve aktivnosti kripto-aktive. Ovakav pristup su primenili Alžir, Bahrein, Bolivija, Kina, Bangladeš, Kolumbija, Dominikanska Republika, Iran, Irak, Indonezija, Maroko, Kuvajt, Maldivi, Nepal, Kirgistan i Katar; (3) objava smernica – pojedina regulatorna tela (poput Uprave za kontrolu i nadzor finansijskog sektora u Ujedinjenom Kraljevstvu, Finansijskog regulatora u Švajcarskoj) su saopštile smernice kojima su klasifikovale kripto-aktivu prema njihovim karakteristikama i podela je izvršena na kripto-aktivu koja se odnosu na hartije od vrednosti, sredstva plaćanja i uslužnu aktivu (eng. utility assets). Smernice su pretežno fokusirane na identifikovanju da li postoji regulativa koja se odnosi na bilo koju od navedenih vrsta kripto-aktive; (4) prilagođavanja regulative – pojedina regulatorna tela (poput Malte i Tajlanda u 2018) su objavile detalje o specifičnim zahtevima koji se mogu primeniti na različite aktivnosti i pružaoce usluga kripto-aktive, uključujući inicijalnu javnu ponudu i sekundarno trgovanje i (5) izvršenje – nekoliko regulatornih tela (poput Komisije u hartije od vrednosti i Komisije za trgovanje robnim fjučersima u Sjedinjenim Američkim Državama) su na pojedinačnoj osnovi uvele opcije izvršenja ili sankcije, kako bi se ograničile aktivnosti vezane za kripto-aktivu.

U januaru 2018. god. Odbor Međunarodne organizacije komisija za hartije od vrednosti objavio je saopštenje u kojem je izrazio zabrinutost koja se odnosi na inicijalnu javnu ponudu novčića (još se naziva prodaja tokena ili prodaja novčića). Saopštenje jasno ukazuje na rizike povezane sa inicijalnom javnom ponudom novčića jer je reč o visoko spekulativnoj investiciji u kojoj investitori rizikuju celokupan uložen kapital. Takođe, saopštenje je ukazalo na zabrinutost zaštite investitora jer je navedena transakcija van nacionalne regulative ili mogu biti predmet ilegalnih operacija koje krše postojeću regulativu (IOSCO, 2018). Nakon toga, u februaru 2020. god. Odbor Međunarodne organizacije komisija za hartije od vrednosti je objavio izveštaj „Pitanja, rizici i regulatorna razmatranja u vezi sa platformama za trgovanje kripto-aktivom“ u kojem je razmatrana kripto-aktiva kao vrsta privatne aktive koja se bazira na kriptografiji ili tehnologiji distribuirane knjige. Kripto-aktiva može da predstavlja aktivu ili vlasništvo nad aktivom poput valute, robe, hartija od vrednosti ili derivata na robi ili hartijama od vrednosti. Principi Međunarodne organizacije komisija za hartije od vrednosti predstavljaju širok okvir za regulisanje kripto-aktive i odnose na (IOSCO, 2020):

(1) saradnju - princip koji se odnose na saradnju obuhvata saradnju između regulatora u pogledu postizanja dogovora pri postavljanju regulatornih ciljeva, supervizije, kao i deljenja informacija sa domaćim i stranim partnerima;
(2) sekundarno trgovanje - princip koji se odnosi na sekundarno trgovanje obuhvata uspostavljanje sistema trgovanja koji će biti predmet prekograničnog nadzora, potom uspostavljanje transparentnog trgovanja, identifikovanje svih praksi nefer trgovanja i adekvatno upravljanje u slučaju velike izloženosti i svake tržišne nestabilnosti;
(3) tržišne posrednike – princip se odnosi na uspostavljanje minimalnih standarda za tržišne posrednike, kao i kapitalnih zahteva, potom definisanje procedura za slučaj lošeg poslovanja posrednika i nadoknada gubitka investitoru;
(4) kliring i poravnanje - sistemi poravnanja hartija od vrednosti treba da podležu regulatornim i nadzornim zahtevima koji su dizajnirani da obezbede pravednost, delotvornost i efikasnost, uz smanjenje sistemskog rizika.

Banka za međunarodna poravnanja je u martu 2019. godine (BIS, 2019) ukazala da ukoliko banka ili neki drugi učesnik na finansijskom sistemu odluči da ima izloženost ka kripto-aktivi da je potrebno da usvoji minimum standarda koji se odnose na due diligence (banka bi trebalo da, pre ulaganja u kripto-aktivu, sprovede sveobuhvatnu analizu rizika koji proizilaze iz kripto-aktive), upravljanje rizikom (svi učesnici finansijskog sistema bi trebalo da upravljanje rizicima kripto-aktive integrišu u sveobuhvatan sistem upravljanja rizicima, uključujući one koji se odnose na borbu protiv finansiranja terorizma i sprečavanje pranja novca), obelodavanje (potrebno je da se javno obelodani svaka materijalna izloženost kripto-aktivi kao deo finansijskih obelodanjivanja) i saradnja supervizora (neophodno je da se informišu supervizori o planiranoj i trenutnoj izloženost ka kripto-aktivi na pravovremen način). Pored toga, kripto-aktiva ne obezbeđuje standardne funkcije novca i nije bezbedna da bi se koristila kao sredstvo razmene ili čuvar vrednosti i nije sredstvo plaćanja, jer toj vrsti aktive nedostaje podrška vlade ili nekog drugog javnog autoriteta. Brojni su rizici kojima kripto-aktiva može da izloži banke – rizik likvidnosti, kreditni rizik, tržišni rizik, operativni rizik (uključujući rizik prevare i sajber rizik), rizik pranja novca i finansiranja terorizma, kao i pravni i reputacioni rizik.

Odbor za finansijsku stabilnost (Financial Stability Board – FSB) je tokom 2019. god. objavio nekoliko izveštaja o regulativi kripto-aktive. U aprilu 2019. god. objavljen je imenik o regulativi kripto-aktive sa ciljem pružanja informacija o relevantnim regulatorima i drugim nadležnim organima koji su pod jurisdikcijom Odbora za finansijsku stabilnost (FSB, 2019) . Tako je na primeru Evropske unije ukazano na nekoliko tela koja su zadužena za regulativu kripto-aktive. U nadležnosti Evropske komisije je priprema planova i regulative na nivou Evropske unije koja se odnosi na finansijski sektor, uključujući i kripto-aktivu, kako bi se razvilo tržište koje je dobro regulisano i globalno konkurentno. Takođe, nadležnost Evropske komisije je nadzor nad efikasnošću primene reforme finansijskog sektora i priprema adekvatnih odgovora na nove rizike po finansijsku stabilnost. Evropsko bankarsko telo nastoji da poboljša funkcionisanje internog tržišta Evropske unije, naročito u pogledu obezbeđenja visokog, efikasnog i konzistentnog nivoa regulative i supervizije koja se odnosi na kreditne institucije, investicione firme, platne institucije i institucije elektronskog novca. Evropsko telo zaduženo za sektor osiguranja i penzijske fondove (eng. European Insurance and Occupational Pensions Authority - EIOPA) nadležno je za monitoring kripto-aktive i za inicijalnu javnu ponudu novčića, dok je misija Evropske agencije za hartije od vrednosti i tržišta (eng. European Securities and Markets Authority - ESMA) da doprinese očuvanju stabilnosti finansijskog sistema Evropske unije obezbeđenjem zaštite za investitore i promovisanjem stabilnih i uređenih finansijskih tržišta.

U maju 2019. god. Odbor za finansijsku stabilnost objavio je dokument koji se bavi regulatornim pristupima kripto-aktive i potencijalnim nedostacima, gde je istaknuto da su regulatorna tela na nacionalnom nivou primenile različite pristupe u regulaciji kripto-aktive, što je opravdano različitim kretanjima na nacionalnom tržištu i razlikama u pravnim okvirima za finansijske sisteme (FSB, 2019a). U izveštaju o regulatornim implikacijama decentralizovanih finansijskih tehnologija, koji je Odbor za finansijsku stabilnost objavio u junu 2019. god., iskazano je da regulativa kripto-aktive predstavlja izazov za regulatore i supervizore finansijskog sistema, naročito one koji su fokusirani na centralizovane finansijske institucije. U slučaju decentralizovanog finansijskog sistema potrebno je ojačati pristup regulacije koja je zasnovana na konkretnim aktivnostima, jer je u tom sistemu teško povezati finansijske usluge sa određenim subjektima i/ili nadležnostima (FSB, 2019b).

Imajući u vidu povećane rizike od sajber napada, Evropska unija nastoji da ojača informacionu sigurnost učesnika na finansijskim tržištima (kao što su banke, investicioni fondovi i osiguravajuće kompanije). Iz tog razloga je Evropski savet u septembru 2020. godine predložio regulativu koja se odnosi na otpornost digitalnih operacija (eng. Digital Operational Resilience Act – DORA) sa ciljem da se očuva otpornost finansijskog sektora u Evropi tokom perioda u kojima je prisutna značajna operativna nestabilnost (EU Council, 2022). Navedena regulativa predstavlja deo paketa regulative digitalnih finansija koja obuhvata regulativu tržišta kripto-aktive i otvorene distribuirane knjige. Savet Evrope je započeo pregovore o usvajanju DORA u novembru 2021. god., dok je dogovor postignut u maju 2022. god. Usvajanjem DORA premošćen je dotadašnji jaz regulatornog okvira Evropske unije time što se usvojena regulativa odnosi na digitalne finansijske instrumente. Time ovaj paket podržava inovacije i uvođenje novih finansijskih tehnologija uz obezbeđenje adekvatnog nivoa zaštite korisnika i investitora. Regulativa tržišta kripto-aktive (eng. Markets in Crypto-Assets Regulations – MiCA), koja je stupila na snagu u junu 2023. god., predstavlja uniformna tržišna pravila na nivou Evropske unije za kripto-aktivu (ESMA, 2023). Ključne odredbe regulative se odnose na emitovanje i trgovanje kripto-aktivom, transparentnost, obelodavanje, autorizaciju i superviziju transakcija na tržištu kripto-aktive. Ovaj regulativni okvir podržava tržišni integritet i finansijsku stabilnost time što reguliše javnu ponudu kripto-aktive i obezbeđuje da korisnici budu bolje informisani o rizicima koji su povezani sa kripto-aktivom. Tokom faze implementacije regulative tržišta kripto-aktive Evropska agencija za hartije od vrednosti i tržišta, zajedno u saradnji sa Evropskim bankarskim telom, Evropskim telom zaduženim za sektor osiguranja i penzijske fondove i Evropskom centralnom bankom, će sprovesti konsultacije o nizu tehničkih standarda koji će biti objavljeni i primenjeni u tri paketa. Prvi paket je objavljen u julu 2023. godine i odnosi se na slanje obaveštenja nacionalnih nadležnih organa uz uspostavljanje obrazaca izveštavanja, postupanje po žalbama, kao i upravljanje i sprečavanje sukoba interesa. Drugi paket biće objavljen u oktobru 2023. godine i obuhvata indikatore održivosti, zahteve za obezbeđenjem kontinuiteta poslovanja, transparentnost podataka o trgovanju, kao i klasifikacija podataka o kripto-aktivi. Treći i finalni paket se očekuje da bude objavljen u prvom kvartalu 2024. godine i obuhvatiće kvalifikaciju kripto-aktive kao finansijskih instrumenata, nadzor i obaveštenja o tržišnoj nestabilnosti, zaštitu investitora i uspostavljanje otpornosti i sigurnosti sistema trgovanja.

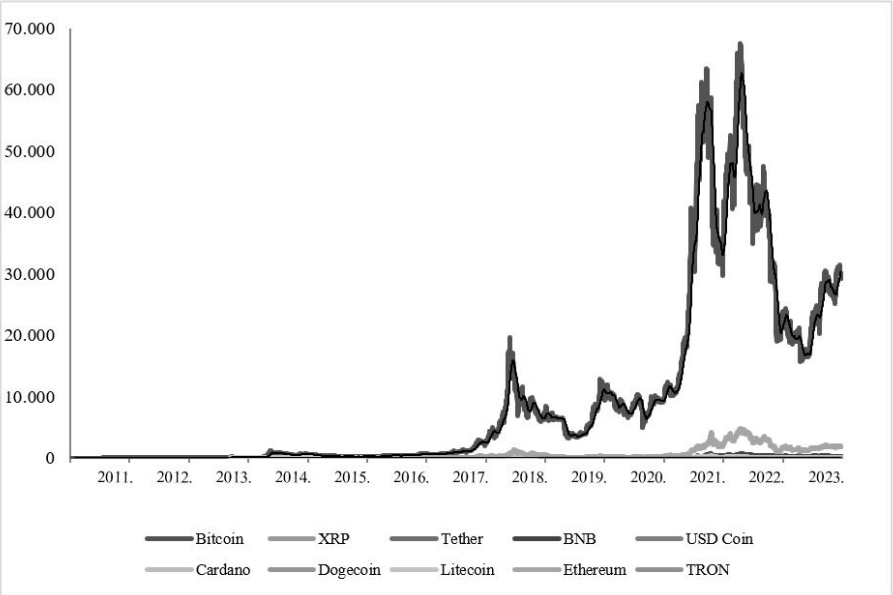
Regulatorni okvir kripto-aktive sa sobom nosi izazove koji se odnose na razvoj nove tehnologije i prisustvo novih transakcija. U tom pogledu je potrebno istaći rizike van nadležnosti regulatora koji se odnose na nadzor, sveukupno obelodanjivanje informacija, kao i kapitalne zahteve i zahteve likvidnosti koji mogu da poboljšaju otpornost učesnika u digitalnom sistemu. Dodatno, potrebno je ukazati na rizike kojima su izloženi imaoci kripto-aktive koji se odražava kroz rad platnog sistema, mogućnost naglog povlačenja sredstava od strane investitora, kao i zabrinutost za postojanje sistemskog rizika (Azar et al., 2022). Upravo dalji razvoj kripto-aktive, pojava novih instrumenata, sistema saldiranja transakcija, kao i potreba zaštite svih učesnika na tom tržištu predstavlja stalni izazov za regulatore ove materije na globalnom nivou.

Rizici po finansijsku stabilnost

Sistem kripto-aktive je međusobno povezan, što je posebno naglašeno nedavnim bankrotstvom mnogih emitenata kripto-aktive. Procikličnost u prodaji može da prouzrokuje ukupnu volatilnost na tržištu kripto-aktive. Ipak, potrebno je ukazati da izloženost kripto-aktive u velikoj meri korespondira onima kojima je izložen tradicionalni finansijski sistem. Cena kripto-aktive u značajnoj meri reaguje na fundamente, poput šokova monetarne politike, koji su posebno prisutni od 2020. godine. U periodima povećanih makrofinansijskih rizika cena naglo pada, što se odražava i na tradicionalne klase aktive poput akcija (Buch, 2023).

Kripto-aktiva predstavlja relativno nov instrument digitalnih plaćanja koji sa sobom, pored velikih mogućnosti, nosi i značajne rizike po postizanje i očuvanje finansijske stabilnosti. Veliki izazov tržišta kripto-aktive predstavlja identifikovanje, monitoring i upravljanje rizicima. To uključuje operativni i finansijski integritet rizika koji potiču od menjačnica kripto-aktive i stvaranje adekvatnog nivoa rezervisanja. Dodatno, na tržištima razvijenih zemalja i zemalja u razvoju može se desiti situacija koja se označava kao „kriptoizacija" koja podrazumeva da kripto-aktiva zameni domaću valutu i time zaobiđe mere koje se odnose na kontrolu deviznih tokova i upravljanja kapitalom (Adrian, He i Narain, 2021). Reč je o klasi aktive koja ima konstantan rast tržišne kapitalizacije, koja prema podacima sajta Coinmarketcap od 26. jula 2023. godine iznosi 1,17 triliona dolara od čega se na učešće bitkoina odnosi 48,4%, a Ethereum 19,0%. Od velikog značaja je ukazati na prisutnu volatilnost cena kripto-aktive. Tako je na primer bitkoin, kao najpoznatija kriptovaluta, sredinom jula 2010. godine imao cenu od svega 0,08 dolara, dok je sredinom jula 2011. god. vredeo 13,6 dolara što predstavlja međugodišnji rast od neverovatnih 157,8%. Na bazi raspoloživih podataka sa sajta Coinmarketcap cena bitkoina u periodu od 18. jula 2010. godine do 25. jula 2023. godine kretala se u rasponu od 0,05 dolara do 67.541,8 dolara. Sličan zaključak o značajnoj volatilnosti cena se mogu izvući i za ostale kriptovalute koje smo prikazali na Grafikonu 1, gde smo pokazali kretanje cena prvih deset kriptovaluta prema visini njihove tržišne kapitalizacije.

Grafikon 1: Kretanje cena izabranih kripto valuta (u USD)



Napomena: Poslednji prikazani podatak za 25 jul 2023.
Izvor: https://coinmarketcap.com/, Pristupljeno: 26.7.2023

Evropska centralna banka je objavila nekoliko analiza koje se bave implikacijama kripto-aktive na finansijsku stabilnost. U Izveštaju o finansijskoj stabilnosti iz maja 2018. godine analiza je pokazala da i pored značajnog rasta vrednosti tržišta kripto-aktive njihova vrednost je i dalje manja u poređenju sa ostalim klasama aktive. Navedeni izveštaj ukazuje da je bitkoin tokom 2018. godine izgubio čak 65% svoje vrednosti, čime je pokazao značajno veću volatilnost u kretanju cene u poređenju sa tradicionalnim klasama aktive. Ovakva kretanja ukazuju da postoje loše mogućnosti da kriptovalute budu pouzdani čuvar vrednosti, sredstvo razmene i jedinica mere. Evropska centralna banka zaključuje da trenutno kripto-aktiva ne predstavlja rizik po finansijsku stabilnost u zoni evra jer je celokupna izloženost tom delu tržišta i dalje skromna, potom postoji niska korelacija sa drugim delovima tržišta i ograničene su veze između finansijskog sistema i realne ekonomije. Ipak analiza ukazuje na nekoliko izvora potencijalne ranjivosti, gde se ističe povećano ulaganje u kripto-aktivu van Evrope i njeno korišćenje kao kolaterala pri kreditiranju. Upravo povezanost finansijskih tržišta na globalnom nivou ukazuje na potencijalnu ranjivost od ulaganja u kripto-aktivu. Evropska centralna banka zaključuje da je potrebno uspostaviti sistem prikupljanja podataka koji će se odnositi na ulaganje finansijskih institucija u kripto-aktivu, upotrebu te aktive kao sredstva obezbeđenja, kao i odobrenje kredita pojedincima i kompanijama koji ulažu u kripto-aktivu, a sve u cilju smanjenje nedostatka podataka koji su potrebni kako bi se ocenilo da li kripto-aktiva predstavlja pretnju od finansijsku stabilnost (ECB, 2018). U analizi iz maja 2019. godine Evropska centralna banka je ukazala da usled nedostatka podataka postoji ograničena mogućnost za procenu sistemskog rizika. Pored toga, navodi se porast brokerskih i svih usluga koje su povezane za institucionalne investitore, što može voditi povećanoj izloženosti kripto-aktivi. U odsustvu navedenih usluga moguće je smanjenje interesovanja institucionalnih investitora za ulaganje u instrumente kripto-aktive usled tehničkih ograničenja (ECB, 2019). U septembru 2020. godine Evropska centralna banka objavljuje radni papir u kojem razmatra potencijalne izvorλ rizika sa tržišta kripto-aktive, a koji mogu imati implikacije po finansijsku stabilnost. Istaknuta su dva rizika: (1) rizik likvidnosti i (2) rizik zaraze (eng. contangion risk). Rizik likvidnosti se odnosi na mogući gubitak investitora usled značajne volatilnosti vrednost kripto-aktive (primer je sajber napad na sistem ili elektronski novčanik), što može da prouzrokuje njihovu odluku o povlačenju investiranih sredstava. Povlačenje ulaganja se može desiti i zbog činjenice da kripto-aktiva ne može da garantuje fiksnu vrednost. U svakom slučaju značajno povlačenje sredstava može da prouzrokuje značajnu volatilnost u kretanju vrednosti kripto-aktive. Rizik zaraze se odnosi na prenosni efekat rizika likvidnosti koji se transferiše na učesnike u finansijskom sistemu usled povezanosti njihovih aktivnosti. Ovakva kretanja bi izazvala značajnu tržišnu volatilnost i priličnu nelikvidnost (ECB, 2020). Istraživanje globalnih regulatora pokazalo je da trenutno kripto-aktiva ne predstavlja pretnju po finansijsku stabilnost, ali zahteva konstantan nadzor i unapređenje regulative, kao i poboljšanje sistema prikupljanja podataka (Follak, 2022).

Edwards et al., (2019) ukazuju na potencijalne rizike sa tržišta kripto-aktive. Ističu da se instrumenti kripto-aktive mogu koristiti za kupovinu nedozvoljenih proizvoda (poput droga), potom ukazuju na mogućnost zloupotrebe anonimnosti pri kupovni kripto-aktive (na primer za finansiranje terorizma), zatim ističu značajnu manipulaciju cenom, što može dovesti do značajnih gubitaka investitora i njihovog poverenja, kao i hakerske napade (samo tokom 2018. godine putem hakerskih napada imaoci kriptovaluta su izgubili skoro jednu milijardu dolara). Rizici kripto-aktive su brojni i uključuju: (1) nedostatak zaštite depozitara; (2) visoku cenovnu volatilnost; (3) dokazano prisustvo da se neke transkacije kripto-aktive koriste za nelegalne aktivnosti, (4) smanjenja kontrola deviznih tokova i kontrole kapitala i (5) u slučaju zemalja u razvoju i razvijenih zemalja postoji rizik od digitalne dolarizacije (Ocampo, 2022).

Prema analizi Evropskog odbora za sistemski rizik potrebno je utvrditi vezu između kripto-aktive i tradicionalnog finansijskog sistema jer je to važan kanal za transmisiju šokova i zahteva dodatnu pažnju kako bi se razumelo prisustvo sistemskog rizika koji kripto-aktiva može da prouzrokuje. Trenutno vrednost kripto-tržišta u poređenju sa tradicionalnim finansijskim tržištem je jako mala, postoji sporadična korelacija između rasta i pada vrednosti kripto-aktive i tradicionalnih finansijskih instrumenata, kao i uključivanje kripto-aktive u postojeći portfolio akcija, obveznica i zlata neće dovesti do značajnijeg poboljšanja odnosa između prinosa i rizika. Ključno pitanje, iz perspektive Evropskog odbora za sistemski rizik, jeste kako tržište kripto-aktive može postati sistemski relevantno. To se može desiti na nekoliko načina. Prvo, značajan rast kripto-aktive može da pokrene naglo povlačenje sredstava, što posledično može da naškodi celokupnom finansijskom sistemu. Drugo, tržište kripto-aktive može da se integriše u tradicionalni finansijski sistem, gde će tradicionalni posrednici imati direktnu ili indirektnu izloženost i svaka veća volatilnost vodiće do sistemske nestabilnosti. Treće, pojava tokena koji bi imali stabilnu vrednost bi mogla da rezultira u stvaranju sredstva razmene koja se obično koriste u platnom sistemu. Takav token bi time delio svaku svaku slabost platnog sistema ukoliko bi se u značajnoj meri koristio (ESRB, 2023).

Rizike kripto-aktive možemo sagledati sa aspekta rizika koji se odnose na investitore i korisnike i na potencijalne rizike po finansijsku stabilnost (Dark et al., 2022). Rizici koji se odnose na investitore i korisnike obuhvataju tržišni rizik i rizik likvidnosti (mogućnost nelikvidnosti kripto-aktive usled značajnog povlačenja sredstva usled visoko spekulativne trgovine) i operativni rizik, uključujući rizik od sajber napada i rizik krađe (navedeni rizici se javljaju usled neregulisanog emitovanja, pružanja usluga i kompleksnosti sistema kripto-aktive. U slučaju sagledavanja potencijalnih rizika za finansijsku stabilnost potrebno je ukazati na sledeće: rizici za banke i druge značajne finansijske institucije (kripto-aktiva je izložena ranjivosti od naglog povlačenja sredstava, posedovanje te imovine kao kolaterala može da donese potencijalne gubitke i postoje pravni, operativni i reputacioni rizici od pružanja usluga poput kastodija), rizik finansiranja (previranja na tržištu mogu da dovedu do značajne prodaje kripto-aktive), rizik buduće upotrebe u plaćanjima (značajnija primena kripto-aktive u plaćanjima bi dovela do pojave rizike, što zavisi od obima i dizajna emitovanja) i klimatski rizici (kontinuirana ili povećana upotreba energetski intenzivne otvorene distribuirane knjige može da pogorša klimatske rizike). Prema istraživanju Saveta za nadzor finansijske stabilnosti (Financial Stability Oversight Council-FSOC) ranjivosti po finansijsku stabilnost sa tržišta kripto-aktive se mogu podeliti na dve kategorije. Prva se odnosi na međuzavisnost između kripto-aktive i tradicionalnog finansijskog sistema. Takva povezanost bi mogla da naglasi efekat šokova koji dolaze sa tržišta kripto-aktive. Druga kategorija pokriva set ranjivosti koji se odnose na tržište kripto-aktive, a uključuju potencijalni pad cene aktive, finansijsku izloženost, operativnu ranjivost, rizik povlačenja sredstava i leveridž. Svaka od navedenih ranjivosti može pojedinačno da se ispolji, ali mogu da deluju interaktivno, kao u slučaju tradicionalnog finansijskog sistema. Na primer spekulacija može da dovede do rasta cene i visokog nivoa leveridža (FSOC, 2022). Prethodno navedeni potencijalni rizici tržišta kripto-aktive zahtevaju pomno praćenje, prikupljanje i obelodanjivanje podataka o transakcijama, kao i stvaranje adekvatnog regulatornog okvira. Sve pobrojano predstavlja izazove za regulatorna i nadzorna tela imajuću konstantan razvoj kripto-aktive.

Zaključak

Globalno finansijsko tržište danas predstavlja osnov za razvoj savremenih tehnologija i primene novih digitalnih instrumenata plaćanja. Digitalizacija plaćanja omogućava povećanje finansijske inkluzije koja posledično dovodi do daljeg ekonomskog rasta i razvoja. Ti instrumenti su dobili na svom značaju i širokoj upotrebi nakon svetske finansijske krize, a naročito tokom pandemije virusa korona, tokom koje je došlo do zatvaranja zemalja. Time su pored upotrebe tradicionalnih finansijskih instrumenata pojedincima i kompanijama na raspolaganju ulaganje u kripto-aktivu, što omogućava diversifikaciju ulaganja. Pojavom kripto-aktive savremeni finansijski sistem je dobio velike mogućnosti na polju digitalizacije plaćanja, ali i značajne izazove i rizike po postizanje i očuvanje finansijske stabilnosti. Od početka emitovanja i trgovanja kripto-aktiva beleži značajnu volatilnost u kretanju cene, konstantan porast tržišne kapitalizacije i povećanje broja novih instrumenata na tom delu tržišta.

Kripto-aktiva se, prema Odboru za finansijsku stabilnost, može definisati kao privatna aktiva koja primarno zavisi od kriptografije i distribuirane knjige ili slične tehnologije kao deo njihove percipirane ili inherentne vrednosti. Pošto se kripto-aktiva može koristiti kao sredstvo razmene koje se elektronskim putem generiše, čuva i transferiše, često se sa stanovišta investitora i regulatora posmatra kao spekulativno sredstvo. Stalni razvoj kripto-aktive doveo je i do povećanja broja instrumenata koji se prema Banci za međunarodna poravnanja mogu podeliti na četiri kategorije - unbacked kripto-aktiva, uslužni tokeni, bezbednosni tokeni i stablecoins. Pored navedenih, potrebno je istaći i digitalne valute centralnih banaka na kojima aktivno rade centralne banke na globalnom nivou. Sama upotreba kripto-aktive zavisi od nekoliko faktora. Makroekonomska nestabilnost u kombinaciji sa neefikasnim platnim sistemom može da podstakne primenu kripto-aktive. Pored toga, nizak nivo kredibiliteta centralne banke može da poveća supstituciju aktive, jer domaći rezidenti mogu da traže sigurno utočište za očuvanje vrednosti svoje aktive, što je prisutno kod zemalja koje imaju visok nivo dolarizacije.

Od velikog značaja je sagledati međusobnu zavisnost tržišta kripto-aktive i instrumenata tradicionalnih finansija (poput akcija i obveznica). Upravo međusobna povezanost učesnika na finansijskom tržištu može da prouzrokuje da se nestabilnost na jednom delu tog sistema prenese na drugi deo i time izazove sistemski rizik koji može da se prenese na celokupan finansijski sistem. Nestabilan finansijski sistem može da zabeleži potencijalno visoke gubitke poslovanja, smanji poverenje investitora, ugrozi dobru reputaciju poslovanja, ali i da stvori visoku izloženost riziku likvidnosti i kreditnom riziku. Iz tog razloga neophodno je aktivno raditi na stvaranju regulatornog okvira kripto-aktive koji treba da omogući globalni nadzor nad svim transakcijama kripto-aktive, potom da pruži punu zaštitu za korisnike i investitore i stvori podstrek za dalji razvoj tog dela tržišta. Pri donošenju regulativnog okvira za kripto-aktivu vodeću ulogu imaju centralne banke, nadzorna i regulatorna tela i druga vladina tela. Tako je Odbor Međunarodne organizacije komisija za hartije od vrednosti ukazao da osnovni princip regulisanja kripto-aktive treba da obuhvati saradnju izmedju regulatora, uspostavljanje sistema sekundarnog trgovanja i minimalnih standarda za tržišne posrednike, kao i rešavanje pitanja koja se odnose na kliring i poravnanje. Banka za međunarodna poravnanja ističe potrebu da se uvede due diligence (sveukupna analiza rizika kripto-aktive), puno obelodanjivanje svake izloženosti kripto-aktivi i obezbeđivanje saradnje između supervizora. Na nivou Evropske unije Evropski savet je u maju 2022. godine usvojio regulativu koja se odnosi na otpornost digitalnih operacija koja je podržala inovacije i uvođenje novih finansijskih tehnologija uz obezbeđenje adekvatnog nivoa zaštite korisnika i investitora. U junu 2023. na snagu je stupila regulativa kripto-aktive čime su usvojena uniformna tržišna pravila na nivou Evropske unije za kripto-aktivu. Dalji razvoj tržišta kripto-aktive, pojava novih instrumenata, sistema saldiranja transakcija, kao i potreba zaštite svih učesnika na tom tržištu predstavlja stalni izazov za regulatore ove materije na globalnom nivou.

Kripto-aktiva, kao relativno nov instrument digitalnih finansija, sa sobom nosi značajne mogućnosti, ali i značajne rizike po postizanje i očuvanje finansijske stabilnosti. Evropska centralna banka je sprovela nekoliko analiza čiji zaključak je da trenutno kripto-aktiva ne predstavlja rizik po finansijsku stabilnost, imajući u vidu da je tržišta kripto-aktive i dalje manje u poređenju sa ostalim klasama aktive. Ipak analiza ukazuje na nekoliko potencijalnih ranjivosti gde je istaknuto da van Evrope postoji povećano ulaganje u kripto-aktivu i njeno korišćenje kao kolaterala pri kreditiranju. Ipak, potrebno je ukazati na potencijalne rizike, koji se prema Evropskoj centralnoj banci odnose na rizik likvidnosti (mogući gubitak investitora usled značajne volatilnosti kripto-aktive) i rizik zaraze (prenosni efekat rizika likvidnosti koji se transferiše na učesnike u finansijskom sistemu usled povezanosti njihovih aktivnosti). Pored navedenih rizika kripto-aktiva predstavlja izvor značajne volatilnosti cena, nedostatak zaštite korisnika, mogućnost korišćenja kripto-aktive za nelegalne aktivnosti, smanjenu kontrolu deviznih tokova i kontrolu kapitala, kao i postojanje rizika od digitalne dolarizacije. Pobrojani rizici mogu da se ispolje na pojedinačnoj osnovi, ali mogu da deluju interaktivno, što otežava njihovo upravljanje. Upravo prisustvo velikog broja potencijalnih rizika kripto-aktiva zahteva adekvatnu reakciju nadzornih organa i primenu odgovarajućeg regulatornog okvira, što je naročito bitno u vremenu stalnog razvoja digitalnih oblika plaćanja.

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FINANCIAL STABILITY IMPLICATIONS FROM THE CRYPTO-ASSET MARKET

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„Crypto-asset markets are fast evolving and could reach a point where they represent a threat to global financial stability due to their scale, structural vulnerabilities and increasing interconnectedness with the traditional financial system."

Financial Stability Board, 16 February 2022

Summary: A component of digital finance that has been developed with an aim to decrease the usage of cash payments and improve financial inclusion is the crypto-asset. Concerns have been raised about the preservation of financial stability, which stands in for one of the primary objectives of central banks - along with price stability - as a result of the significant growth of the market capitalization of crypto-assets, as well as the rise in the variety of crypto-assets instruments and the volatility of their prices. Operating outside of national borders, crypto-asset trading platforms could lead to a concentration of risk and a lack of business transparency. The market for crypto-assets is growing more quickly, which highlights the need for strict regulation of that sector of the market, data collection to effectively monitor transactions, as well as providing protection for consumers and investors. The safety of all partipicants, the efficient operation of the financial system, and the maintenance of financial stability should all be guaranteed by the regulation of the crypto-asset market.

Keywords: crypto-assets, financial stability, digitization, regulation

JEL classification: G11, E63

*The views expressed in this paper are those of the author and do not necessarily represent the official view of the National Bank of Serbia.

Introduction

The usage of modern technologies is becoming more and more significant in the global financial industry. Modern forms of payment based on various types of digital financial assets were established following the global economic crisis, particularly during the Corona virus pandemic when the country's closure measures were in place. Today, investors have the option to diversify their portfolios by purchasing crypto-assets in addition to investing in currencies, precious metals, equities, and bonds. A large amount of price volatility, high market capitalization, and a potentially high level of risk for establishing and maintaining the stability of the financial system have all been present since the beginning of the production of crypto-assets. In this paper, we will examine how the crypto-asset market may affect financial stability. The implications for the market's financial stability will be examined in this essay. We will begin with a review of the literature in the first section before moving on to a description of the characteristics of crypto-assets. The third section of the paper examines the regulatory framework for crypto-assets, and the fourth section evaluates the risks to financial stability posed by that sector of the financial market. We summarize the main findings of this paper in the conclusion.

Literature Review

The use of digital payment methods, which were developed with the goal of achieving greater financial inclusion, remains crucial today. This strategy is justified given that financial inclusion is thought to contribute to further economic growth and development, as well as social well-being. The crypto-asset market has a number of instruments that represent one of the digital payment methods. The global financial system has faced both opportunities and challenges as a result of its development. It is important to note that if the relationship between the institutions of the traditional financial system (including banks, leasing firms, and insurance companies) is not properly regulated and supervised, the crypto-asset market could pose serious risks to financial stability. As a result, the traditional financial system can result in significant corporate losses, undermine investor trust, endanger enterprises' reputation, and expose them to significant credit and liquidity concerns. Because of their interdependence, participants in the financial market have the potential to cause a chain reaction, which makes it simple for one participant's instability to spread to other players in the system. As a result, the financial system instability of a single country can spread to other countries, destabilizing their financial systems through raising systemic risk. In fact, systemic risk - which may be characterized as a financial risk that affects the entire financial system rather than just specific institutions - might increase as a result of the negative effects of digital finance (Risman et al., 2021). The fact that systemic risk was the main cause of the 2008 financial crisis is the best example of how large the impact of systemic risk can be.

The standard definition of financial stability or the stability of the financial system lacks a consensus. The World Bank (2020) indicates that there are numerous definitions of financial stability, and most of them have in common that the term implies the absence of episodes of stress in which the financial system cannot function, which leads to the emergence of crises. The interconnectedness of all financial system participants, currency substitution, and the fact that service providers from the crypto-asset market can generate a significant amount of systemic risk are highlighted by Bains et al. (2022) in their analysis of the main risks to financial stability that can be brought on by the market for crypto-assets.

These service providers also perform a greater number of activities in the market, which highlights market risk and third-party risk. The regulator's response to the risks mentioned above should focus on actively monitoring how much exposure each financial system participant has to the market for crypto-assets, limiting their potential investment in those instruments, and then establishing global cooperation and coverage for each exposure to those instruments. The many risks that crypto-asset market instruments may present in relation to financial markets and systems are something that financial authorities are working to solve. Specifically, this refers to market efficiency, investor protection, market integrity maintenance, and financial stability (Zetzsche et al., 2020).

The fact that traditional financial instruments have a very distinct set of constraints on their issuance and trading from crypto-asset market instruments is what sets them apart. Unlike traditional financial instruments, which are managed by governments and central banks and are governed by fiscal and monetary policy rules, cryptoassets are not subject to national regulation. Crypto-assets are then built on a digital, global economy that runs without intermediaries. This approach to conducting transactions significantly complicates the application of traditional regulatory policies and strategies to control crypto-assets (Elliott and De Lima, 2018). It is important to conduct a thorough analysis of these transactions in order to fully comprehend the numerous factors that investors consider when deciding whether to invest in crypto-assets. Due to the use of pseudonyms, it is challenging to associate each open trading account with specific people or businesses. Open distributed ledgers allow anybody to access the whole history of data on each individual transaction (Feyen et al., 2022).

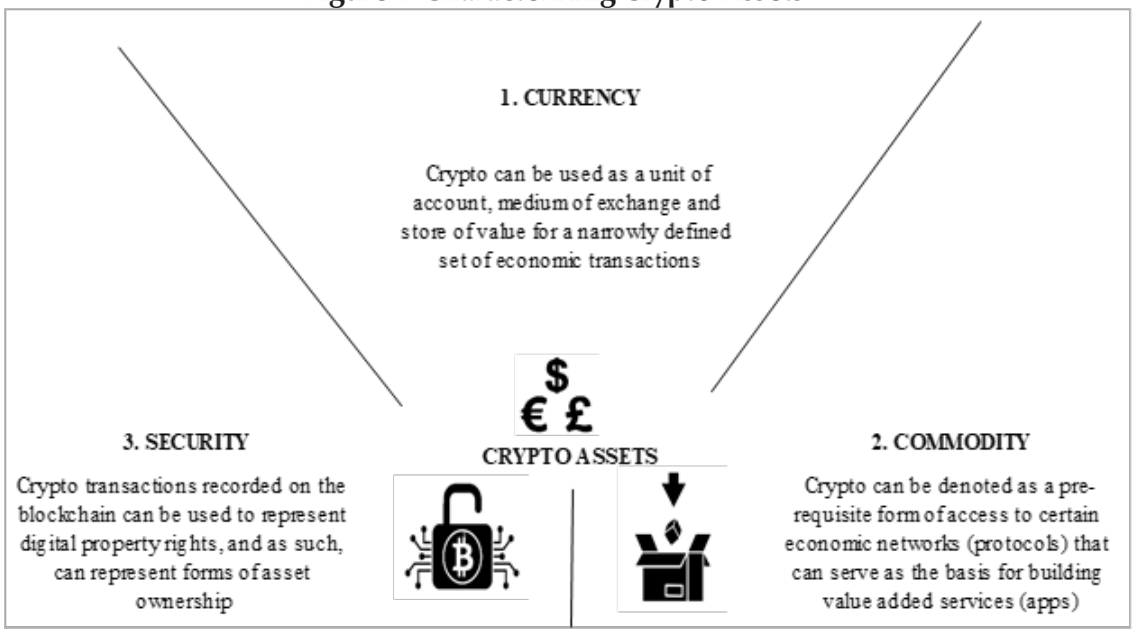
In addition to the enormous risks associated with the crypto-asset market, its benefits must also be highlighted. In circumstances where appropriate regulation is used, the use of crypto-assets has significantly altered the traditional global financial system, resulting in improved financial inclusion, more efficient transaction execution, and a decrease in systemic risk. The advantages of crypto-assets were emphasized during the recent Corona virus outbreak because they enabled for distant financial transactions and helped to lower transaction costs (Ozili, 2023). In order to maintain the growth and development of that segment of the market, a good regulatory framework should strike a balance between maintaining the protection of clients and investors and offering sufficient incentives for additional innovation in the crypto-asset market. Equally crucial are clearly stated guidelines that should cover all potential dangers associated with the crypto-asset market so that everyone applying the regulation does it in accordance with the rules (Bakken, 2022).

Characteristics of Crypto-Assets

Because they may be used as an electronic means of exchange that is generated, held, and transferred, crypto-assets have revolutionized the traditional financial sector. Crypto-assets have experienced tremendous price fluctuation since they were first created. As a result, from the viewpoint of both investors and regulators, crypto-assets are frequently viewed as speculative instruments (Garcia-Singh, Thomas, and Persad, 2021). Every month, thousands of new inventions are made in the field of crypto-assets, and new products based on a distributed ledger and crypto technology are also released (Demertzis and Wolff, 2018). Due to the introduction of Bitcoin as the most well-known cryptocurrency in 2008, there was a considerable increase in trading volume on the market for crypto-assets. Then, using the alias Satoshi Nakamoto, a paper was published analyzing the architecture of an electronic payment system via the creation of novel and ground-breaking blockchain technology. It is still unknown if that pseudonym relates to a specific person or a group of persons (Martin, 2020).

The development of crypto-assets shows that opportunities and threats coexist in an equal measure. In order to build a decentralized method of payment as well as a tool that may guard against inflation and currency depreciation, crypto-assets were initially developed. The development of new technologies, on which crypto-assets are based, with the application of adequate regulation, can create additional instruments compared to those offered by the traditional financial system. A crypto-asset is a private asset that largely relies on cryptography, distributed ledgers, or comparable technologies as part of its perceived or intrinsic worth, according to the Financial Stability Board's definition (FSB, 2018). This definition of a crypto-asset excludes it from the concept of traditional types of assets. However, it should be noted that various crypto-asset types can exhibit features of money, commodities, or securities - Figure 1.

Figure 1: Characterizing Crypto-Assets



Source: Elliott, D. and De Lima L. (2018). Crypto-assets: their future and regulation, Oliver Wyman, p. 8

Numerous crypto-assets frequently undergo severe price volatility, which makes them unreliable as a store of value and a measure of value. A global analysis of the data reveals that there is no unified taxonomy for crypto-assets. According to Brains et al.'s analysis from 2022, there are four categories of crypto-assets that are recognized by recognized regulators like the Bank for International Settlements.- Table 1. Unbacked crypto-assets that are portable, based on a decentralized method of balancing transactions, and primarily intended to be used as a medium of exchange are referred to as the first type. Bitcoin serves as an illustration of how the majority of this type of crypto-asset is used for speculation. Another category of crypto-asset is utility tokens, which are those that grant access to a current or planned good or service. A tokenized card for shopping at a certain store falls under this category. Security tokens are under the third category. They give the holder the same rights as holders of securities, such as the right to a portion of the issuer's profits. The term "stablecoins" refers to the fourth class of crypto-assets, which are based on a stable asset value, which could be a single asset or a collection of assets (such as a particular currency or precious metal). Stablecoins like Tether, Binance USD, and USD Coin are examples.

Bullmann et al.'s (2019) analysis claims that stablecoins are a type of cryptocurrency that don't actually reflect any particular currency (or basket of currencies), but instead base its value on stabilized instruments to lessen the impact of currency volatility. We differentiate several sorts of stablecoins: (1) Fiat-backed stablecoins are those that are directly linked to the current financial system through the ownership of conventional financial instruments; (2) Crypto-backed stablecoins are those that are supported by a reserve of crypto-assets, which may include both backed and other types of stablecoins. Crypto-backed stablecoins have a substantially larger degree of collateral because unbacked crypto-assets are frequently volatile, providing protection in the case of a decline in the value of the collateral. This kind of stablecoin frequently incorporates a mechanism to liquidate crypto-asset collateral if its value drops below a certain level, ensuring the stablecoin's solvency and (3) Stablecoins known as algorithmic stablecoins do not have any reserve assets used to determine their value. Through an algorithm that controls the stablecoins' supply and demand ratios, this kind of stablecoin aims to ensure price stability (MacDonald and Zhao, 2022).

It's crucial to draw attention to the digital currencies of central banks, which, under the Federal Reserve System's definition, are a digital obligation of the central bank that are accessible to the general public in addition to the aforementioned categories of crypto-assets. Digital payments are thus made possible thanks to central bank digital currencies (CBDC). Global central banks are actively developing their digital currencies: the Bank of England is working on the digital pound, the Federal Reserve System is developing the digital dollar, and the European Central Bank is introducing the digital euro. The central bank that issued the currencies would be in charge of them, creating an extra method of payment in addition to cash and non-cash forms of payment (Martin, 2021). Understanding how the adoption of central bank digital currencies will affect monetary policy and financial stability is crucial for central banks. Additionally, central banks' digital currencies must not be a cause of financial instability that could interfere with the way monetary policy is transmitted (Panetta, 2022). Non-fungible tokens, also known as NTF tokens, are a unique sort of crypto-asset, as opposed to fungible tokens, which all have the same value. Non-fungible tokens can be used to prove ownership of digital assets like artwork, music, or virtual properties because each one is unique.

Table 1: Taxonomy of Crypto Assets, NFTs and CBDC

NFT tokens	Securuty tokens	Utility tokens	Unbacked Crypto Asset	Stablecoins	CBDC
-Usually centrally issued	-Centrally issued	-Centrally issued	-Usually decentralised	-Designed to be value stable	-Centrally issued by a state of central bank
-Right to ownership of specific product	-Meets the definition of a security in each respective jurisdiction	-Right to a product/ service	-Designed to be used as a means of exchange	-Stability mechanism can be backing or collateralization with a commodity, fiat currency, multiple currencies, crypto assets of algorithms	-Designed to be value stable
-Collectible and non-substitutable	-Within the regulatory perimeter	-Accepted cross multiple ecosystem	-Limited rights for the token holder		-Stability mechanism is usually sovereign fiat currency
		-Transferable	-No single issuer to enforce right against		
		-Can be used as a means of exchange	-Transferable		

Source: Bains, P., Ismail, A., Melo, F. and Sugimoto , N. (2022). Regulating the Crypto Ecosystem: The Case of Unbacked Crypto Assets, International Monetary Fund, FinTech Notes No 2022/007, p. 12

The increased use of crypto-assets could be influenced by a number of variables. In some developing and developed countries, an ineffective payment system paired with an unstable macroeconomic environment can promote the usage of crypto-assets. As domestic residents look for a safe haven to maintain the value of their assets, a low degree of central bank credibility may boost asset substitution. This is particularly evident in countries with high levels of dollarization. Existence of a cryptosystem may encourage domestic residents to transfer their assets into various kinds of instruments that represent crypto-assets. An ineffective payment system and restricted access to financial services are the next two factors that may promote the use of crypto-assets. One issue that can hinder the flow of remittances is the incompatibility between various domestic payment systems. Remittances are occasionally transferred in cash through the post office and other transmission operators since a sizable portion of the population in some developing nations lacks access to a bank account. Stablecoins, which serve as a stable unit of account, can make the flow of remittances faster and less expensive when using crypto-assets. This strategy obviously involves use of the Internet and other technology, which are not widespread in many nations. It should be kept in mind that when using crypto-assets to receive remittances, they can be held for a short period of time (during the period of receipt), after which the recipients can exchange the foreign inflow for domestic currency and make purchases on the domestic market. The use of crypto-assets may have an impact on potential fiscal policy concerns due to tax evasion, and there may be a decrease in seigniorage income as a result of less currency in circulation. A crypto-asset may see a capital outflow if there is higher demand for it, which would have an impact on the foreign exchange market. Then, in order to achieve market segmentation, it is required to implement capital management measures and other measures relating to crypto-assets (GFSR, 2021).

Regulatory framework for crypto-assets

The establishment of the regulatory environment for crypto-assets is largely driven by central banks, supervisory and regulatory organizations, and other governmental entities. After Bitcoin and other cryptocurrencies gained popularity, the central banks published announcements and cautions as their initial responses to the potential risks from the crypto-asset market. The following has been accomplished so far in terms of establishing the regulatory framework for crypto-assets, according to Cuervo, Morozova, and Sugimoto (2019): (1) warning announcement - the majority of regulatory authorities, including the Financial Conduct Authority in the UK and the Securities and Exchange Commission of the United States, have released statements alerting the public to the risks associated with cryptoassets; (2) announcement of prohibitions - a number of regulatory authorities have made the decision to outlaw all cryptocurrency-related activity. Algeria, Bahrain, Bolivia, China, Bangladesh, Colombia, Costa Rica, the Dominican Republic, Iran, Iraq, Indonesia, Morocco, Kuwait, the Maldives, Nepal, Kyrgyzstan, and Qatar have all adopted this strategy; (3) publication of guidelines - a few regulatory bodies, including the Swiss Financial Market Supervisory Authority and the Financial Conduct Authority in the UK, released guidelines that divided crypto-assets into categories based on their characteristics, such as those related to securities, payment methods, and utility assets. The guidelines are primarily concerned with determining if any of the listed categories of crypto-assets are subject to regulation; (4) regulatory adjustments – some regulatory bodies, including Malta and Thailand in 2018, have published details of specific requirements that may apply to various crypto-asset activities and service providers, including initial public offerings and secondary trading and (5) enforcement – several regulatory bodies, including the Securities and Exchange Commission and the Commodity Futures Trading Commission in the USA, have introduced enforcement or sanction options on a case-by-case basis. Initial public coin offers, also known as token sales or coin sales, are something that the Board of the International Organization of Securities Commissions expressed worry about in a statement that released in January 2018.

Because the initial coin offering is a highly speculative transaction in which investors risk their whole investment, the announcement makes clear the hazards involved. Additionally, the announcement raised the issue of investor protection because the aforementioned transaction falls outside of national law or could be a target of unlawful activities that violate the law as it stands (IOSCO, 2018). The International Organization of Securities Commissions' Board later discussed crypto-assets as a class of private asset based on cryptography or distributed ledger technology in a report titled "Issues, Risks, and Regulatory Considerations Relating to Crypto-Asset Trading Platforms" published in February 2020. An asset or ownership of an asset, such as money, commodities, securities, or derivatives on commodities or securities, can be represented as a crypto-asset. The International Organization of Securities Commissions' (IOSCO's) guiding principles provide a comprehensive framework for managing digital assets and include (IOSCO, 2020):

(1) cooperation - the principle of cooperation covers information sharing with both local and international partners, supervision, and cooperation between regulators in establishing regulatory goals;
(2) secondary trading - the establishment of a trading system subject to international oversight, the development of transparent trading, the detection of all unfair trading practices, and the effective management of high exposure and any market instability are all part of the secondary trading principle;
(3) market intermediaries - the principle entails establishing minimum standards for market intermediaries as well as capital requirements, followed by the definition of procedures for the case of poor performance by intermediaries and compensation of losses to investors;
(4) clearing and settlement – promotion of justice, efficacy, and efficiency while lowering systemic risk, regulatory and supervisory standards should apply to clearing and settlement.

The Bank for International Settlements (BIS, 2019) stated in March 2019 that if a bank or other financial system participant decides to have exposure to crypto-asset, they must adopt minimum standards related to due diligence (the bank should make sure that, prior to investing in crypto-asset, a thorough analysis of the risks arising from crypto-asset is carried out), risk management (all financial system participants should incorporate the risk management of crypto-assets into a comprehensive risk management system, including those related to the fight against the financing of terrorism and the prevention of money laundering), disclosure (it is necessary to publicly disclose any material exposure to crypto-assets as part of financial disclosures), and cooperation of supervisors (it is required to inform supervisors about planned transactions with crypto-assets in order to obtain their cooperation). A crypto-asset also lacks the backing of a government or other public authority, making it unsafe to use as a medium of exchange or store of value and ineligible to be used as payment. As a result, it cannot perform the traditional functions of money. Liquidity risk, credit risk, market risk, operational risk (including fraud and cyber risk), money laundering and terrorist financing risk, as well as legal and reputational risk, are just a few of the risks that crypto-assets might expose banks to.

The Financial Stability Board (FSB) released a number of reports on the regulation of digital assets in 2019. In order to provide information on pertinent regulators and other competent bodies falling under the purview of the FSB, a directory on the regulation of crypto-assets was released in April 2019 (FSB, 2019). Thus, numerous organizations that are in charge of regulating crypto-assets were mentioned, using the European Union as an example. In order to create a well-regulated and internationally competitive market, the European Commission is in charge of creating policies and rules at the level

Additionally, it is within the purview of the European Commission to develop appropriate responses to emerging threats to financial stability and monitor the efficiency with which the financial sector reform is being implemented. By ensuring a rigorous, effective, and uniform level of regulation and oversight of credit institutions, investment firms, payment institutions, and electronic money institutions, the European Banking Authority hopes to enhance the efficiency of the European Union's internal market. While the European Securities and Markets Authority (ESMA) is charged with protecting investors and working to maintain the stability of the European Union's financial system, the European Insurance and Occupational Pensions Authority (EIOPA) is responsible for overseeing crypto-assets and the initial public offering of coins. Regulatory bodies at the national level have applied different approaches to the regulation of crypto-assets, which is justified by different movements in the national market and differences in the legal framework for financial systems, according to a document published by the Financial Stability Board (FSB) in May 2019 that dealt with regulatory approaches to crypto-assets and potential shortcomings (FSB, 2019a). The FSB stated in a report on the regulatory implications of decentralized financial technologies published in June 2019 that regulating crypto-assets presents a challenge for financial system regulators and supervisors, particularly those that focus on centralized financial institutions. Since it is challenging to link financial services to specific companies and/or jurisdictions in a decentralized financial system, it is required to enhance the approach to regulation that is based on concrete activities (FSB, 2019b).

The European Union aims to improve the information security of market participants (including banks, investment funds, and insurance companies) in light of the rising threats of cyberattacks. To preserve the financial sector's resilience in Europe during times of significant operational instability, the European Council proposed a regulation relating to the resilience of digital operations (the Digital Operational Resilience Act, or DORA), in September 2020 (EU Council, 2022). The aforementioned regulations is a component of the package of laws governing digital finance, which also covers an open distributed ledger and the regulation of the market for crypto-assets. In November 2021, the Council of Europe began discussions about adopting DORA; in May 2022, an agreement was reached. Due to the accepted regulation's reference to digital financial instruments, the adoption of DORA filled the previous gap in the EU's legal framework. While maintaining an acceptable level of security for users and investors, this package encourages innovation and the introduction of new financial technologies. The Markets in Crypto-Assets Regulations (MiCA), which became effective in June 2023, represent standardized market regulations for digital assets at the level of the European Union (ESMA, 2023). The main provisions of this rule involve transparency, disclosure, authorisation, and supervision of transactions in the crypto-asset market and are relevant to the creation and trading of crypto-assets. By regulating the public selling of crypto-assets and ensuring that users are properly educated about the risks involved with crypto-assets, this regulatory framework promotes market integrity and financial stability. The European Securities and Markets Authority, along with the European Banking Authority, the European Insurance and Occupational Pensions Authority, and the European Central Bank, will conduct consultations on a number of technical standards that will be published and applied in three packages during the implementation phase of the crypto-asset market regulation. The first package, which was released in July 2023, addresses the construction of reporting forms, the treatment of complaints, the management and prevention of conflicts of interest, as well as the sending of notifications to national competent authorities. The second set of regulations, which will be released in October 2023, will address sustainability indicators, business continuity needs, trade data transparency, and classification of crypto-asset data. The third and final package, which focuses on investor protection, establishing the trading system's resilience and security, and qualifying crypto-assets as financial instruments, is anticipated to be published in the first quarter of 2024.

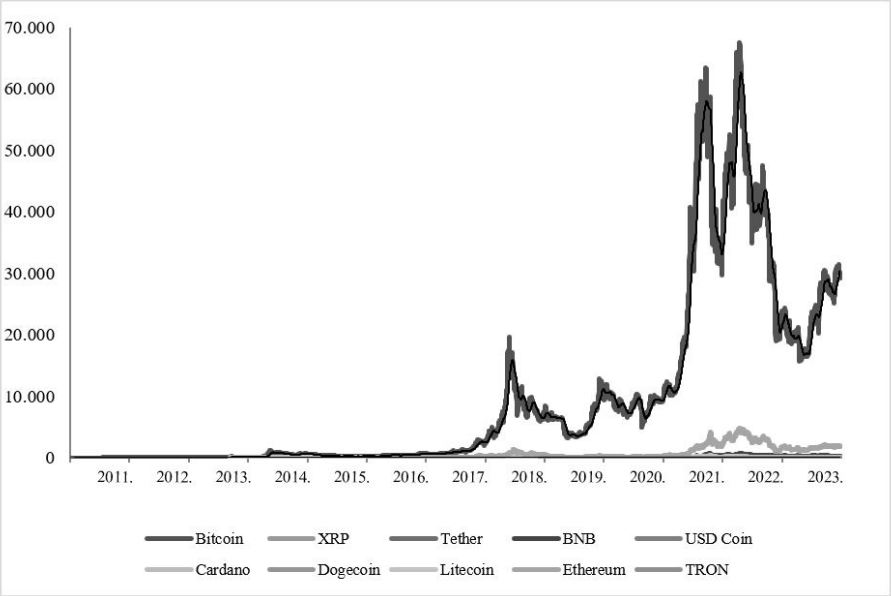
There are issues with the regulatory framework for crypto-assets that are related to the emergence of new technology and the existence of new transactions. In this context, it is important to draw attention to the risks relating to oversight, information disclosure in general, and capital and liquidity requirements that may increase the resilience of system participants and fall outside the authority of the regulator. Furthermore, it is important to draw attention to the risks that owners of crypto-assets face, which are represented in the functioning of the payment system, the potential for investors to withdraw money suddenly, and worries about the existence of systemic risk (Azar et al., 2022). The worldwide regulators of this issue face a continuing challenge due to the continued development of crypto-assets, the emergence of new instruments and transaction settlement mechanisms, as well as the requirement to protect all market participants.

Financial Stability Risks

The recent bankruptcy of numerous crypto-asset issuers serves to highlight the interconnectedness of the crypto-asset system. Procyclicality in sales might lead to market volatility overall for crypto-assets. It should be noted, nonetheless, that the exposure to which crypto-assets are exposed broadly reflects the exposure to which the conventional financial system is exposed. Fundamentals like monetary policy shocks, which have been particularly prevalent since 2020, have a big impact on how much the price of the crypto-asset reacts. The price plummets during times of elevated macro-financial concerns, which is also seen in conventional asset classes like shares (Buch, 2023).

Crypto-assets is a relatively new form of digital payment that offers both huge benefits and serious threats for reaching and maintaining financial stability. Identifying, monitoring, and managing risks is a significant difficulty in the crypto-asset market. This includes the implementation of an acceptable degree of provisioning as well as the operational and financial integrity of risks resulting from crypto-asset exchanges. Additionally, "cryptoization"—a situation where crypto-assets take the place of the national currency and eventually get around controls on capital management and foreign exchange flows—may happen in the markets of developed and developing nations (Adrian, He, and Narain, 2021). According to the Coinmarketcap website, the market value of this asset class reached 1.17 trillion dollars on July 26, 2023, of which 48.4% will be accounted for by bitcoin and 19.0% by Ethereum. It is crucial to draw attention to the current volatility of crypto-asset values. For instance, the most well-known cryptocurrency, bitcoin, only cost 0.08 dollars in mid-July 2010 but was worth 13.6 dollars in mid-July 2011, an astounding increase of 157.8% year over year. According to data from the website Coinmarketcap, the price of bitcoin fluctuated from $0.05 to $67,541.8 between July 18, 2010 and July 25, 2023. For the other cryptocurrencies that we have displayed in Chart 1, where we have shown the price movement of the top 10 cryptocurrencies based on market capitalization, a similar conclusion about considerable price volatility can be formed.

Graph 1: Price movement of selected cryptocurrencies (in USD)



Note: Last observation is for 25 July 2023
Source: https://coinmarketcap.com/, Accessed: 26.7.2023

The effects of crypto-assets on financial stability have been the subject of various analyses issued by the European Central Bank. The study published in the May 2018 Financial Stability Report demonstrated that, despite the market's notable rise, cryptocurrencies still have a lesser value than other asset classes. According to the aforementioned analysis, bitcoin lost up to 65% of its value in 2018, displaying noticeably more volatility in price changes than established asset classes. Such developments point to dim prospects for cryptocurrencies serving as a trustworthy tore of value, medium of exchange, and unit of measure. Since there is currently a low overall exposure to that segment of the market, there is little correlation with other areas of the market, and there are few connections between the financial system and the real economy, the European Central Bank comes to the conclusion that crypto-assets do not currently pose a risk to financial stability in the euro zone. However, the analysis identifies a number of possible areas of vulnerability, with rising crypto-asset investment outside of Europe and its usage as collateral for lending standing out. The global financial markets' interconnectedness serves as a warning about the possible risk of investing in crypto-assets. The European Central Bank comes to the conclusion that, in order to reduce the lack of data required to determine whether cryptoassets pose a threat to financial stability, it is necessary to establish a data collection system that will be related to the investment of financial institutions in cryptoassets, the use of those assets as collateral, as well as the approval of loans to individuals and companies that invest in crypto-assets (ECB, 2018). Additionally, the European Central Bank's examination from May 2019 found that there is no opportunity to evaluate systemic risk because of the lack of data. Additionally, institutional investors are becoming more exposed to crypto-assets due to the growth of brokerage and all connected services. Due to technical restrictions, institutional investors' interest in purchasing crypto-asset securities may decline in the absence of the aforementioned services (ECB, 2019). The European Central Bank publishes a working paper in September 2020 that examines potential sources of risk from the market for crypto-assets that could have an impact on financial stability. There were two risks that were mentioned: (1) liquidity risk and (2) contagion risk. Liquidity risk refers to the possible loss of investors due to significant volatility in the value of crypto-assets (a cyberattack on a system or an electronic wallet is an example), which may lead them to decide to withdraw their invested monies.

Because crypto-assets cannot ensure a steady value, withdrawal of investments may potentially occur. In any case, a sizable withdrawal can result in sizable volatility in the movement of the crypto-asset's value. Liquidity risk that can spread to other participants in the financial system as a result of connections between their activities is referred to as contagion risk. A large increase in market volatility and illiquidity might result from such changes (ECB, 2020). According to research conducted by international regulators crypto-assets do not currently pose a threat to financial stability, but regulation needs to be continually monitored and improved, as well as the data collection system (Follak, 2022).

According to Edwards et al. (2019), there may be risks in the market for crypto-assets. They draw attention to the fact that crypto-asset instruments can be utilized to purchase illicit goods (such as drugs), the potential for abusing anonymity when purchasing crypto-assets (for example, to finance terrorism), significant price manipulation that can result in significant losses for investors and their trust, as well as hacker attacks (in 2018 alone, cryptocurrency holders lost almost one billion dollars as a result of hacker attacks). The risks associated with crypto-assets are numerous and include: (1) a lack of depository protection; (2) high price volatility; (3) the proven existence of some crypto-asset transactions being used for illegal activities; (4) the relaxation of capital and foreign exchange controls; and (5) the possibility of digital dollarization in both developing and developed nations (Ocampo, 2022).

The traditional financial system is an important channel for the transmission of shocks and requires additional attention to understand the presence of systemic risk that crypto-assets can cause, according to the analysis of the European Board for Systemic Risk. For this reason, it is necessary to determine the relationship between crypto-assets and the traditional financial system. The value of the crypto market is currently very small in comparison to the traditional financial market; the value of crypto assets and traditional financial instruments fluctuate at random; and adding crypto-assets to an existing portfolio of stocks, bonds, and gold will not significantly improve the return-to-risk ratio. How the crypto-asset market might become systemically significant is a crucial concern from the standpoint of the European Systemic Risk Board. This may occur in a number of ways. The entire banking system could be affected first by unexpected withdrawals brought on by significant growth in crypto-assets. Second, the market for crypto-assets can be incorporated into the established financial structure, where traditional intermediaries will have direct or indirect exposure and any increased volatility will result in systemic instability. Third, the establishment of tokens with a steady value can lead to the development of a single medium of exchange for the payment system. If such a token were to be used in a substantial manner, it would therefore share every flaw with the payment system (ESRB, 2023).

When considering the risks associated with users, investors, and potential threats to financial stability, one can consider the risks associated with crypto-assets (Dark et al., 2022). Risks related to investors and users include market risk, liquidity risk (possibility of illiquidity of crypto-assets due to a significant withdrawal of funds due to highly speculative trading), and operational risk, including the risk of cyber-attacks and theft risk (the aforementioned risks arise due to unregulated broadcasting, service provision, and the complexity of the crypto-asset system The following should be mentioned when discussing potential risks for financial stability: funding risk (market instability may result in a sizable sale of cryptoassets), risks for banks and other significant financial institutions (cryptoassets are exposed to vulnerability from sudden asset allocation, holding that asset as collateral can bring potential losses, and there are legal, operational, and reputational risks from providing services like custody), funding risk (market turmoil can lead to a significant sale of crypto-assets), risk of future use in payments (more significant use of crypto-assets in payments would lead to the emergence of risks, which depend on the volume and design of the broadcast), and climate risk (continued or increased use of energy-intensive open distributed ledgers can exacerbate climate risks). Financial Stability Oversight Council (FSOC) research has identified two categories of financial stability vulnerabilities coming from the crypto-asset market. The first is related to the interconnectedness between traditional finance and crypto-assets.

Such a link can intensify the impact of shocks coming from the market for crypto-assets. The second group of risks includes a variety of crypto-asset market vulnerabilities, such as possible asset price drops, financial exposure, operational vulnerability, withdrawal risk, and leverage. Although each of the aforementioned vulnerabilities can appear on its own, they can also interact, as in the case of a traditional financial system. For instance, speculation may result in price hikes and significant leverage (FSOC, 2022). The market for crypto-assets needs to be closely monitored, transaction data must be collected and disclosed, and a suitable regulatory framework is required. All of the aforementioned pose difficulties for regulatory and oversight entities that must deal with the ongoing evolution of crypto-assets.

Conclusion

Today's global financial markets serve as the foundation for new digital payment instruments and the advancement of contemporary technologies. Payment digitization makes it possible for more people to use financial services, which subsequently promotes greater economic growth and development. After the global financial crisis, those tools became more significant and frequently used, particularly during the corona virus pandemic when entire nations were shut down. Thus, individuals and businesses can invest in crypto-assets in addition to using traditional financial instruments, allowing for investment diversification. The advent of crypto-assets has provided the modern financial system with many potential for the digitization of payments, but it has also created substantial risks and obstacles for reaching and maintaining financial stability. Since they were first broadcast and traded, crypto-asset have had a high degree of price volatility, a continuous rise in market value, and an increase in the number of new instruments entering that market.

According to the Financial Stability Board, crypto-assets are private assets whose perceived or actual worth principally depends on encryption, distributed ledgers, or related technology. Crypto-assets are frequently seen as speculative assets from the perspectives of investors and authorities because they can be used as a medium of exchange that is electronically generated, stored, and transferred. The number of instruments that fall into the four categories of unbacked crypto-assets, utility tokens, security tokens, and stablecoins has increased as a result of the continuous development of crypto-assets, according to the Bank for International Settlements. In addition to the aforementioned, it is important to draw attention to the central banks' digital currencies, which are currently the subject of active global development. The very use of a crypto-asset depends on a number of variables. The adoption of crypto-assets may be influenced by macroeconomic volatility mixed with a poor payment infrastructure. Furthermore, a low degree of central bank credibility, which is evident in nations with high levels of dollarization, may lead to a rise in asset substitution as local people look for safe havens to maintain the value of their possessions.

It is crucial to consider how the traditional financial markets for stocks and bonds and the cryptoasset market are interdependent. Because financial market participants are tied to one another, instability in one area of the system may spread to another, creating a systemic risk that may affect the entire financial system. An unstable financial system can result in potentially large business losses, erode investor trust, jeopardize a company's good name, and increase vulnerability to credit and liquidity risk.

Because of this, it is essential to work actively on the development of a regulatory framework for crypto-assets that will enable global supervision of all crypto-asset transactions, offer complete protection for users and investors, and encourage further growth of that sector of the market. The establishment of the regulatory environment for crypto-assets is largely driven by central banks, supervisory and regulatory organizations, and other governmental entities. As a result, the International Organization of Securities Commissions Board stated that the fundamental principles of regulating crypto-assets should include cooperation between regulators, the establishment of a secondary trading system and minimum standards for market intermediaries, as well as the resolution of issues related to clearing and settlement. The Bank for International Settlements emphasizes the necessity of implementing due diligence (an overall risk review of crypto-assets), complete disclosure of any exposure to crypto-assets, and guaranteeing supervisory collaboration. The European Council enacted rules pertaining to the resilience of digital operations in May 2022 at the level of the European Union, fostering innovation and the adoption of new financial technologies while maintaining an acceptable level of user and investor safety. The regulation of crypto-assets, which adopted consistent market regulations at the level of the European Union for crypto-assets, went into effect in June 2023. The global regulators of this issue face ongoing problems from the continued growth of the crypto-asset market, the appearance of new instruments and transaction settlement mechanisms, as well as the requirement to safeguard all market participants.

As a relatively new form of digital finance, crypto-assets present both substantial opportunities and threats for achieving and maintaining financial stability. Considering that the market for crypto-assets is currently relatively tiny in comparison to other asset classes, the European Central Bank has done a number of assessments that have come to the conclusion that crypto-assets do not constitute a risk to financial stability. However, the research identifies a number of possible vulnerabilities. It is noted that investments in crypto-assets and their use as loan collateral have grown outside of Europe. However, it is important to draw attention to the potential risks, which the European Central Bank claims are related to liquidity risk (the potential loss of investors due to the high volatility of crypto-assets) and contagion risk (the effect of liquidity risk spreading to participants in the financial system as a result of their interconnected activities). In addition to the risks already mentioned, other risks associated with crypto-assets include high price volatility, a lack of user protection, the potential for using them for illegal activities, a loss of control over capital and foreign exchange flows, and the possibility of digital dollarization. The stated risks might appear individually, but they can also interact with one another, making it challenging to manage them. Because there are so many potential risks connected to crypto-assets, supervisory authorities must respond appropriately and implement an acceptable regulatory framework. This is crucial at a time when digital payment methods are constantly evolving.

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