BANK OF ALBANIA

DIGITAL CURRENCIES IMPACT ON FINANCIAL STABILITY AND FINANCIAL CYCLE

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DISCUSSION PAPER 01 (01) 2022

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C O N T E N T

EXECUTIVE SUMMARY

Digital currencies (DC) have spread quickly enough to draw the attention of policymakers and international organizations. The benefits in terms of greater speed and efficiency of payment transactions are clear. A greater ambiguity prevails regarding the risks to financial stability and monetary policy effectiveness. We consider three different classes of digital currencies, floating price digital currencies, stablecoins and central bank digital currencies (CBDC) and assess their potential to gain wide use as means of payment or as store of value. Basic criteria relative to fiat currency like (i) the easiness to do transactions, (ii) price volatility, (iii) the probability of default and (iv) the access to currency are used to rank private digital currencies and the CBDCs to assess such potential to gain broad public acceptance.

Our attention focuses first on stablecoins as a private DC that has a better premise to spread further. We review key implications the spread of DCs could have for financial stability and highlight that stablecoins introduce many of the common risks that would prevail in an unregulated traditional financial system. Having the unit of account function attached, makes stablecoins even more challenging, both as a means of payment and as a store of value. In particular, we emphasize that the risks from the growth of stablecoin ecosystems may lead to greater disintermediation, greater probability of bank runs and stronger cross-border spillover effects and can be amplified by financial cycles of a greater magnitude. Risks arising from broader use of FinTech products and services are also a source of instability for the financial system, when the latter is directly or indirectly exposed to such products.

Policymakers and standard-setting organizations have faced the dilemma whether to regulate the FinTech ecosystem to minimize risks from broader spread of stablecoins or to challenge them with public digital currency, CBDC. We discuss first risks arising from introducing a CBDC to the financial markets. Issuing a CBDC presents similar challenges regarding financial disintermediation, greater sensitivity of retail depositors that could lead to bank runs and much greater cross-border and capital flight risks. On a positive

note, analytical investigations in theoretical settings suggest they are better manageable than in an environment with private DCs.

Designing the optimal CBDC to strike a balance between risks and benefits from introducing CBDC may take time. In the meantime, regulatory and supervisory authorities will have to address current risks facing financial markets from the exposure to private DCs and other FinTech products. We review the current policy approaches and guidelines that standard-setting organizations suggest under existing regulatory frameworks as a policy aiming to contain risks. We also underline some of the challenges regulators still face. Finally, we introduce some key facts from the Albanian economy to highlight the exposure of a small open economy to the risks covered in the discussion above.

I. INTRODUCTION

The drive for improvements in payment infrastructure through new payment technologies has challenged the conventional concept of money. Private digital currencies (DC) have revived the premise of more timely and cheaper payment transactions. The emergence of Bitcoin and of distributed ledger technology (DLT) in 2009 planted the seeds for a new wave of innovations that aim at addressing that premise. After a few years in the market, particularly after the years 2014-2016[1], Bitcoin and the blockchain technology it relies on have triggered the proliferation of other private digital currencies (DC) in a short period of time. Further spread of new forms of money, in digital format, cannot be avoided if the quest for more efficient payment systems is to be addressed.

The presence in the market of private DCs with a variety of designs, for several years now, has already shown that a digital currency has the potential to partially replace the existing forms

[1] The number of new cryptocurrencies started to grow exponentially during or after these years. There are no specific reasons why the emergence of other cryptocurrencies relying on blockchain or a similar form of technology have spread right after these years.

of money, financial wealth and volume of transactions among, sometimes anonymous, private agents. Even that argument can be sufficient to challenge the tradition that issuing money is a privilege of the governments. The growth of market capitalization of private DCs following the small scale success so far as a means of payment have raised their prospects as a store of value.

Certainly, the increasing volume of transactions and of market value of private digital currencies and the growing consensus that the current cost of payments is unacceptably high have raised over time the prospect that public DCs could emerge at some point. Initially, central banks have been in denial of such prospects. The winds are currently in their favor. In an environment with a growing demand for faster, cheaper and more efficient payments than that provided by traditional channels, a DC with the sovereign guarantee has a greater potential than private DCs to become a mainstream means of payment.

Nowadays, central banks (CB) are exploring the opportunity and evaluating the challenges of the process. Undoubtedly, the emergence of public or sovereign DCs by central banks seems a much longer and delicate process. There are good reasons for deliberately throwing a great amount of intellectual energy in the potential design of a central bank digital currency (CBDC). Among them are the implications these sovereign DCs might have for monetary policy, financial stability and for the real economy.

In this short review, we discuss the implications that DCs have for financial stability. To begin with, we identify broad criteria that rank the potential of all DCs to become mainstream means of payment and store of value. That allows us a narrative why some private DCs pose greater challenges to the current financial landscape. We highlight risks that some of the private DCs pose to financial stability from a regulatory perspective and emphasize how further implications could take place through an amplified financial cycle in the economy. Undoubtedly, policymakers are not without options against these challenges raised by the emergence of private digital currencies. Policymakers can introduce new regulations to supervise and regulate the private digital ecosystems

or they may address some of the issues by competing with their own public digital currencies. The latter option poses its own risks to the financial stability particularly through the magnitude of financial cycles. We discuss the policy approaches advised by standard-setting organizations under the existing regulatory frameworks, that national supervisory authorities are expected to follow. We also stress what challenges policymakers still face. Finally, we close with a summary of the perspective of Albanian economy pointing to how exposed less developed and small open economies are.

II. RISKS FROM ADOPTION OF DCS FOR FINANCIAL STABILITY AND FINANCIAL CYCLE

Implications for financial stability and monetary policy of existing private DCs have been negligible so far. Private DCs in circulation are renowned for a more efficient means of payment, while the store of value function seems rather of secondary importance when looking at how these private DCs are marketed. In their role as store of value market capitalization of private DCs as share of monetary wealth is rather insignificant. At best, the market capitalization of all cryptocurrencies, including stablecoins, has reached around 4% of monetary base globally[2]. As a payment vehicle, the volume of transactions is still small, even after the boom of transactions denominated in stablecoins over the last two years. The volume of transactions in percentage of total volume of payment transactions reported by VISA stands below 8% (see Figure 1). A critical observation that can be spotted is that while stablecoins make up for about half of the volume of transactions denominated in all cryptocurrencies, their market capitalization is very tiny compared to market capitalization of other floating-price cryptocurrencies. The difference should account for the highly speculative prices of the latter, leading to the shift of the focus towards stablecoins[3].

[2] We calculated the monetary base of all economies of all countries that are either members of the Group of Seven (G7), or of Euro Area or of BRIC countries. The total GDP of these countries account for more than ¾ of the world GDP.

[3] For a split of market capitalization among floating-price cryptocurrencies refer to Figure 5 in Appendix.

Intuitively, with the growing demand for a digital currency with a stable price, a DC with similar features but with sovereign backing is bound to be a much more attractive form of money to replace the fiat currency or other forms of financial wealth. Central banks of large and developed economies have taken note of this intuition. Being aware of China's ambitions and of the disadvantages of being a follower rather than a leader seems to be the final nail ending the debate from the perspective of CBs of international currencies, like Fed and ECB. Nowadays, an increasing number of CBs are taking steps to explore the opportunities and risks from issuing digital format of their respective sovereign currencies (Boar & Wehrli, 2021).

The growing uncertainty regarding the potential issuance of a Central Bank Digital Currency (CBDC) by issuers of international currencies like USD and Euro should come as no surprise among policymakers in small open economies (SoEs). The CBDC issued by the central banks of larger advanced economies may not only substitute part of the fiat money of the issuing country, but also has the potential to further facilitate currency substitution in SoEs, particularly those with any degree of dollarization. From the perspective of SoEs, there is a particularly strong interest to explore how the access to a CBDC in foreign currency as a means of payment and as a store of value might have implications for the financial cycle and the broader financial stability.

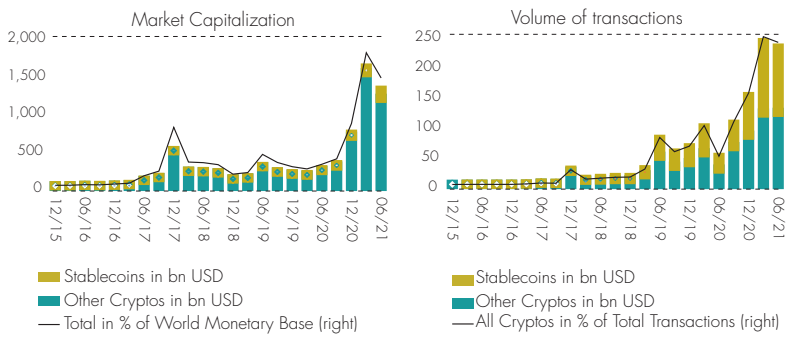
To keep track of the relative potential of DCs for financial stability and financial cycle, our focus is on three classes of digital currencies that are competitors to the fiat currency with potential implications for financial stability, monetary policy (MP) and the economy. Based on the relevance of their characteristics for the potential to substitute the fiat currency of a SoE we define these three groups of DCs as:

1. cryptoassets,
2. global stablecoins,
3. CBDCs.

We deliberately keep the CBDCs separately in this list since they are instrumental decisions under the control of the local

governments, aiming at limiting currency substitution from private digital currencies. The common thread that connects the three DCs is the great potential to substitute the local fiat currency leading to the already known phenomena of currency substitution (hereby CS). Such "digital coinization", where all three classes of DC would replace the two functions of local currency as a means of payment and as a store of value, could have strong repercussions for financial stability and monetary policy.

Figure 1 Volume of transactions and market capitalization: Stablecoins and other cryptocurrencies



Note: Total transactions is the number of Visa's Total Payment Volume (see https://businessquant.com)
Source: https://Coinmarketcap.com; https://data.imf.org

II.1 THE POTENTIAL OF DCS TO BE ADOPTED AS A MEANS OF PAYMENT OR STORE OF VALUE

The adoption of cryptoassets and of stablecoins by households and private firms so far has been low, across developed economies and less developed ones, whether in large or small open economies. The current state begs the question: ***"What is the relative potential of each class of DC to replace the volume of transactions and the financial wealth denominated in fiat currency in a SoE environment?"*** That helps understand the relative merit of each class of DC.

To shed some light on that question we focus on the particular characteristics of these three DCs that interfere with their potential to serve as alternative currency vis-à-vis the local fiat currency in any SoE. It can be helpful to make a simple comparison of these three classes of DCs by ranking them by:

(i) the ease of transactions relative to fiat currencies,
(ii) the price volatility relative to local fiat currency,
(iii) the potential of the issuer to default or the inability to recover the funds denominated in that particular DC into a conventional safe currency, and
(iv) the access to that particular DC.

If financial disintermediation is to take place, a DC has to beat all the other competitors, including the fiat currency, at least in terms of these criteria.

Ease of transactions. First, the speed, the cost and ease of making a transaction in any DC determines how widely it can be used as a means of payment. Cryptocurrencies and other private DCs were promoted as an alternative means that made transactions faster, easier and at a lower cost compared to fiat currencies[4]. In a similar way, other digital currencies like global stablecoins or potential CBDCs allow much easier, faster and cheaper transactions than the fiat currencies. While many issues have been raised about the scalability of the volume of transactions with Bitcoin and other cryptocurrencies, all three types of DCs we listed earlier have the alleged basic feature to make transactions easier relative to existing forms of transacting.

Price volatility. Second, price volatility relative to fiat currency does deter households and firms from making use of a digital currency, primarily as a store of value. The price of almost all cryptocurrencies, except most stablecoins, follow similar price patterns like Bitcoin with dramatically high price fluctuations since their inception. Despite their exponential price growth ex-post, cryptoassets are

[4] In the case of Bitcoin, transactions were cheaper only for large wholesale transfers while for small retail payments other cryptocurrencies or stablecoins claim to have reduced the cost of transactions.

poor investment options with very low expected value due to drastic price fluctuations marking the unusually high price uncertainty. The same shortcoming undermines them as a mainstream currency for payment transactions. More recently, a new type of cryptocurrency, stablecoins, have addressed that shortcoming while maintaining the advantage of ease of transactions.

Potential to default. Third, all types of cryptocurrencies are issued by private unregulated agents sometimes anonymous to the public and are prone to default. This feature undermines their role as a store of value relative to sovereign currencies. Convertibility into fiat currencies, whose value is guaranteed by the sovereign, can be suspended at any point in time or their value may decline to zero. Among cryptocurrencies, one can differentiate stablecoins with a slightly smaller risk due to partial or full backing by reserves in fiat currency or other conventional financial assets like gold etc. Indeed, in terms of both price volatility and potential to default stablecoins are a superior store of value relative to other types of cryptocurrencies. That may explain the growing volume of transactions denominated in stablecoins over the past two years.

Access to currency. Fourth, the access to the currency is a critical criteria for a digital currency to serve as an alternative money, with which to make payments or to store wealth by substituting the fiat currency. On one side familiarity to technology and reliability of many intermediaries, like crypto exchanges, that facilitate access to cryptocurrency can become a concern. To a degree these concerns can be addressed through regulatory frameworks, supervisory actions and financial education in the medium term. On the other hand, CBDCs with access enabled by similar technologies can be as easily accessible, unless their use is restricted by design. Indeed, CBDCs could be marketed as an instrument to promote financial inclusion in economies with large unbanked populations. The technological infrastructure on which they will rely may provide households and firms a greater sense of security due to the backing of the sovereign.

Table 1. Comparison of the three classes of DCs in terms of key characteristics

Relative to the Fiat Currency of SoEs	Cryptoassets	Global Stablecoins*	Foreign CBDC
Ease of transactions	easy/moderate	easy	easy
Price volatility	high	low	low
Potential to default	high	medium	low
Access to DC	easy/moderate	easy/moderate	easy unless limited by design

Source: Authors

Given the advantages that CBDCs have relative to all cryptoassets, including stablecoins as shown in Table 1, access to a foreign CBDC has the potential to become an instrument by central banks of large economies issuing CBDC to limit the fallout that CBDC may cause to financial disintermediation in local currency particularly in less developed economies (LDE) and emerging market economies (EME). Clearly, many of the implications of foreign CBDCs for financial stability, monetary economy and the real economy of the host country could be mitigated through careful design of the foreign CBDCs by authorities in the home country. For the sake of argument we might abstract from any restrictions regarding the access to foreign CBDCs. The access to foreign or local CBDCs and the regulatory framework of the host and home countries may both become macroprudential policy instruments by the central banks of the respective countries.

II. 2 FINANCIAL STABILITY RISKS FROM THE ADOPTION OF PRIVATE DCS

In terms of all four criteria summarized in Table 1 stablecoins are rather superior both as a store of value and as a means of payment relative to other types of cryptocurrencies. Demand for other cryptocurrencies with fluctuating prices can come from the less risk averse agents lured from expectations of future profits or the alleged anonymity of the transactions. Demand for stablecoins on the other hand comes from agents who may use them as an

efficient means of payment or as an alternative store of value, notwithstanding the issuers' potential to default on redeeming their value in the future (credit risk). We emphasize upfront that a critical concern of the rise of the private DCs, particularly of stablecoins, is currency substitution risk or "stablecoinisation" risk. We coin the term according to stablecoins because these DCs, among cryptocurrencies, have the greatest potential due to their stable prices and the reserves backing them.

Currency Substitution Risk. While some risks are more acute when a DC serves as either a means of payment and are closely related to it, there could be implications from the currency substitution or stablecoinisation similar to dollarization. For those stablecoins pegged to a basket of currencies almost all risks relevant to a SoE due to dollarization apply to an advanced economy due to stablecoinisation. A small exception make stablecoins pegging their values to the local currency of an economy, which bear no exchange rate risk. All other risks relevant to currency substitution remain relevant. Stablecoinisation of liabilities and assets of agents, households, firms or FIs, in an economy make policy instruments employed to achieve financial stability or monetary stability less effective, despite other elements of the functioning or the arrangements of that DC.

The stronger potential is also well recognized by the greater attention global stablecoins are receiving from international financial or standard-setting organizations like FSB (2020), BIS (2019) and Adachi et al. (2020) from ECB. Some of the arguments raised in their publications are also shared in our article. We attempt to highlight the most relevant risks related to currency substitution associated with the broad adoption of private DCs.

II.2.1. RISKS RELATED TO THE USE OF PRIVATE DCS AS A MEANS OF PAYMENT

We will refer to risks to the financial stability from the private DCs as a means of payment, with the premise that stablecoins are more likely than any other private DCs to become a mainstream national or global currency. While making transactions with a

digital currency like stablecoins is easier than in the conventional channels, there are potential risks from the functioning of stablecoin ecosystem as a whole. Once the payment ecosystem reaches a certain size relative to a local economy or the global one, partial or full malfunctioning of that system may risk the entire financial system in that economy.

- *Contagion risk*. Risk arising from the performance of the infrastructure or arrangements of the global stablecoin could spread into a systemic risk for the stablecoin payment system. Any malfunctioning on any of the parts of the payment system or any segment of the stablecoin arrangements may spread instantly due to contagion effects and direct or indirect exposure of the financial system to the stablecoin ecosystem. Chain effects may trigger a default of payments by actors operating in the conventional financial system due to exposure from borrowers exposed in the stablecoin system.

- *Liquidity risk.* A liquidity run in the (global) stablecoin ecosystem, or any cryptocurrency, may cause a fire sale of reserve assets as a last resort to provide liquidity and facilitate the continuation of the DC's payment function. A fire sale may trigger a decline in the price of all other financial assets. First, round effects would amount to the direct exposure of financial institutions (FI) to the same assets. A second set of implications would follow from a possible downward financial (and business) cycle triggered by the fire sale with repercussions for other sectors of the economy, exposing the financial system to a whole set of second round effects.

- *The loss of confidence in a global stablecoin (GSC) or spillover effects across different locations*, have similar implications to the contagion effects discussed above for financial stability. An ECB publication raises alternative issues related to similar malfunctioning of the stablecoin infrastructure that could derail the means of payment function of a GSC (Adachi, Cominetta, Kaufmann, & van der Kraaij, 2020). A FSB consultative document addresses similar risks under a general term, *operational disruption of its role a means of*

payment, to include any type of disruption in the functioning of transactions with stablecoins that could be imported into the conventional financial system and adversely affect the financial stability through a chain effect of non-performing transactions (FSB, 2020). Once a non-performing transaction affects one financial institution, trust in that institution and on the whole stablecoin ecosystem may be questioned, triggering a downfall of all the actors involved and of the whole financial system.

- ***Technological risk***. Apart from technological innovations that distinguish stablecoins from other forms of private money, the former can be considered similar to any existing form of private money, like deposits exchangeable at unit price for Central Bank money, namely cash (Segal-Knowles, 2021). Once the ***technological risk*** inherent in the financial technology underlining all stablecoins is taken into account and properly managed under a regulatory framework, the latter have all implications of other private money for the country where they are issued.

II.2.2 RISKS RELATED TO THE USE OF PRIVATE DCS AS A STORE OF VALUE

Among all private digital currency models currently in circulation, stablecoins have the potential to scale up in use as a reliable store of value due to their stable price and partial/full reserve backing. Yet, holding them as an asset could be at best as safe as any other financial asset created by existing financial intermediaries, if not less. The additional risks of such an asset arise from the role of unit of account attached to the stablecoin. Here we stick to a comprehensive overview of risks related to DCs as store of value relevant for financial stability.

- ***Default risk and Wealth Effect***. All private DCs holders bear the risk of not being redeemed at some point in the future. In the case of cryptocurrencies the value of the currency depends on the demand for that currency by the others and the willingness to exchange fiat money for the cryptocurrency

held by other agents. Cryptocurrencies with free-floating price are much riskier as their price may decline towards zero at any time. Stablecoin holders bear the risk of default by the issuer, particularly when they are not fully backed by reserves and not regulated.

The motivation of the stablecoin issuer to keep running the currency is to have a higher net worth from running it as a means of payment than from defaulting and running away with the seigniorage collected. As long as it is not regulated and monitored, it is not clear whether the cryptocurrency ecosystem is a viable business as an innovative digital vehicle for transactions or rather a Ponzi scheme[5]. Even in the case of stablecoins with full reserve backing their value, the default by the issuer of the currency is still an issue due to runs on the currency and safety of the reserves.

Two sets of effects stems from the loss of value or total default of cryptocurrency (and stablecoin) issuers. The direct effect on financial stability is when financial institutions are exposed to cryptoassets. An indirect effect may materialize when the wealth losses by households kick in a downward asset price spiral hence kicking a downward financial and business cycle in an economy. The scale of the indirect effect would depend on both the magnitude of the wealth effect and also the state of the economy.

- *Credit, liquidity, market and foreign exchange risks from change in market value of the reserves backing a stablecoin*. For stablecoins with reserves backing their value, the ability of the issuer to redeem its value depends on the market value of those reserves. Typical risks such as credit, liquidity market and foreign exchange risks affect the value of financial assets denominated in fiat currency and, as a consequence, the market value of reserves invested in those assets (BIS, 2019). The ultimate bearer of such risk may still be the stablecoin holder. Typically, the requirement that the issuer contributes

[5] Relying on more money coming in than coming out. Once that balance is tipped over, the currency value defaults to null.

financial wealth in the form of equity, or similar schemes that would absorb losses from such market risks, can mitigate the effects.

Should the market value of the reserves fall drastically and losses not covered by the equity of the issuer, the ability of stablecoin holders to redeem its value in the currency comprising the basket of reserves may be questioned. Indeed, too low a value of reserves backing the stablecoin may trigger a run on the currency. The implications of the wealth effect for financial and business cycle are similar to those discussed earlier and well elaborated in literature (Adachi, Cominetta, Kaufmann, & van der Kraaij, 2020).

- *Operational risks to FIs from participation as intermediaries of a private DC.* When FIs participate in the ecosystem of a DC or of a global stablecoin (wallet providers, exchanges, management of reserve assets for GSC) they could be exposed to any risks related to credit, market or operational risks (FSB, 2020). An operational disruption of its role as means of payment or a decline in the trust of that currency could disrupt the asset management function of a stablecoin, or any other cryptoasset reaching a certain scale. The perception that a financial asset denominated in any stablecoin is like other financial assets denominated in fiat currency underestimates the risks undermining the stablecoin's function as a store of value. The unit of account function and the payment and transfer functions attached to a stablecoin undermine the asset management function of the stablecoin or of any private DC.

- *Capital Flight.* A DC that recognizes no national boundaries and that allows transfer of wealth instantly, efficiently and without approval by third parties may raise concerns regarding the risk of capital flight. Such risk is rather more pronounced in emerging market economies (EME) and less developed countries (LDC), with shallower financial markets. There is a good reason why EME countries generally maintain slightly tighter controls on either outward or inward capital flows, which usually relates to the greater country risk, institutional risk, higher inflation risk,

foreign exchange risk, banking risk etc.
The impact that capital flights may have on (downward) financial and business cycle and the implications the latter has for the financial stability are well-known. Capital flows are closely related to prices of financial assets and to aggregate demand. Capital outflows may cause a decline of the prices of physical assets (house, land) which could further trigger a downward spiral. Both first round effects from exposure to those real assets and second round effects from decline in activity of other sectors of an economy threaten the stability of the whole financial system. What is new in a DC environment is the instantaneous time it takes to transfer capital immediately using a DC, which makes economies and their financial systems vulnerable to expectations of a sudden jump in risk even before capital flight happens.
Furthermore, on the financial market front a flight-to-safety trend could make FIs run dry of any long-term retail funds and make them dependent on wholesale liquidity. In most cases that wholesale liquidity will be provided by a public actor, as private FIs will be very risk-averse in terms of lending to each other when liquidity evaporates as seen during the Global Financial Crisis (GFC) in 2008.

- ***Bank Runs.*** Bank runs are more sensitive than capital flights. The latter require unfavorable macroeconomic or social factors to take place. Factors that could trigger a bank run could vary from financial ones, like (i) low yield on deposits, (ii) more efficient payment transactions with the DC, or rather more social or behavioral factors, like (iii) fear of loss of opportunities with the DC, (iv) general trend among peers, or (v) slightest loss of confidence on the banking system. Again, it is the ability of retail depositors to transfer funds quickly in a DC environment that makes the expectations of a bank run an instantaneous self-fulfilling ending.

  Bank runs have similar implications for an economy: (a) on the real side of the economy, bank runs disrupt the intermediation of savings in an economy that despite a possible short-term increase in consumption, are followed by a decline in

aggregate demand due to fall in investments in the medium term; (b) on the financial side, an immediate short-term upward impact on prices of real assets could take place as retail depositors may see real assets as an alternative to park their savings. In the medium term, bank runs make FI management prioritize bank survival at the cost of lower financing for private sector and of lower private investments in the economy. Due to such mechanism, bank runs may trigger a downward financial cycle and jeopardize financial stability if left out of control.

In case funds go towards a private DC following a bank run, disruption of financial disintermediation, loss of retail funds for FIs, and possible higher cost of short-term wholesale funding cannot rebound quickly enough to support lending of the private sector. It may take some time, before FIs or banks start financial intermediation in digital currency so that those effects are mitigated.

- *Profitability Risk from Digitalization.* Introduction of DCs will probably drive down the cost of transactions which is a key revenue for FIs, even in EME or LDC. Lower cost of transactions leads to lower profitability for FIs in these economies. Intuitively, it is not up to public authorities to shield banks neither from technological innovations nor competition. Yet, while FIs may still find alternative ways to raise profits, declining profitability from existing products and services might put into question their business models threatening the whole financial system. Monitoring over time is critical to mitigate their impact on the financial stability (BIS, 2019).

- *Risk from underlying Technology.* Finally, risks from the technology of cryptocurrencies as a threat to financial stability are of no less importance (BoE, 2014). Any bugs in the technology underlying cryptocurrencies or fraud by the miners could lead to massive wealth losses by those holding those cryptocurrencies. In the case of Bitcoin, a hypothetical fraud by the miners is a transaction fraud by a small group of miners becoming technically feasible when the number of miners

declines substantially due to lower profitability from mining[6]. Ultimately, the implications for financial stability are caused by both: (i) disruptions in those segments of financial system that have integrated cryptocurrencies in their payment transactions, and (ii) wealth effects on real asset prices and on financial stability.

Finally, unlike financial assets denominated in fiat currency, wealth denominated in stablecoins bears the risk from an unregulated issuer, at least during the transitional phase towards a more regulated market. Only when the balance sheet of the issuer is monitored from a public authority that may require the issuer to hold some equity can such a risk be minimized. Furthermore, should financial intermediation or peer-to-peer lending denominated in stablecoins grow in a regulated ecosystem, then we may also see a similar impact on the reduction of borrowing premium charged on borrowers due to greater fierce competition among lenders.

II.2.3 IMPLICATIONS OF NEW FINTECH ECOSYSTEMS FOR FINANCIAL STABILITY AND FINANCIAL CYCLE

The academic literature on financial cycle is relatively new, but a common consensus among researchers is that the financial cycle is a financial risk cycle, the regular ups (periods of risk appetite and risk taking) and downs (periods of risk aversion and deleveraging) in the perception of the financial risks. It is the tendency of the financial system to amplify economic fluctuations that creates a financial cycle.

The rapid developments in crypto-related markets is an emerging financial vulnerability. It will be important to see whether these developments may alter the evolution of the main features of the financial cycle (length and amplitude) by adding more instability. At this phase it is difficult to assess such an impact empirically, because the level of "financialization" of cryptoassets is limited so far, we have not observed the developments over a full

[6] One hypothetical case would be when price of cryptocurrency declines, energy consumption goes up and the community of miners declines significantly (due to loss of interest) to make it possible to manipulate the ledger.

cycle yet and there are vast data gaps in the crypto area. However, we can assess analytically the implications of a widespread use of cryptocurrencies as a source of systemic risk, in its cyclical and structural dimension, during the boom and bust phases of the cycle, especially for a small open economy.

The propagation of financial cycles will depend on the type and size of exposures that regulated financial institutions have with crypto-asset markets in the form of provision of credit, direct investments, trading, market making, crypto-asset custody services for clients etc. The more cryptocurrencies gain wider practical use in daily economic transactions, the higher such level of interconnectedness is expected to be, and such financial activity may amplify the crypto cycle by providing fuel to the booms. In general, credit booms and over-indebtedness to finance investments with overvalued asset prices have been identified as the main causes of financial crises (Borio & Lowe, 2002). Exposures to such investments and activities may increase the probability of a crisis with serious consequences for financial stability, particularly when they are material and funded with short-term debt (Nelson, 2017).

Apart from the regulated financial system, a whole ecosystem of FinTechs is developing around cryptocurrencies, which potentially may give rise to the supply of money in the form of crypto M1, M2 and M3. New ecosystems of FinTechs emerging around cryptocurrencies growing at global scale will be at least subject to the same financial stability challenges as the traditional monetary systems (Danielson, 2018). However, Borio (2012) discusses that the length and amplitude of the financial cycle depend on policy regimes, with financial deregulation being a driver to longer and higher amplitude financial cycles. Such implications may become apparent in the future as long as cryptocurrencies will provide a higher level of eased financial constraints through looser regulation and oversight and as long as the ability of the monetary policy to control money supply becomes more limited.

While booms build up slowly, they tend to deflate rapidly. International use of a stablecoins, global stablecoins (GSC), may add pressure during periods of heightened systemic

financial stress (which usually coincides with the reversal phase of the financial cycle) in several ways:

- First, they could serve as a flight to safety, if perceived as a safe and liquid alternative to deposits, intensifying the amplitude and severity of a potential bank run.
- On the other hand, panics arise from agents' worries about the stability of the stablecoin issuers. The failure of particular stablecoin issuers, or cyber-related incidents may hinder the credibility of cryptocurrencies in general through confidence effects (FSB, 2018-b), which may devaluate rapidly the value of their holdings. This shock may in turn be transmitted to the real economy through wealth effects.

From the financial cycle and financial stability perspective, any kind of ***large scale disruption*** in stablecoin's functions as a means of payment could affect not only prices of financial assets, but also of real physical assets and the price of capital, hence triggering a downward financial and real business cycle in a SoE.

Cryptocurrencies will make the financial system more integrated globally and facilitate the cross-border transmission of shocks. The domestic financial cycle would be more dependent on the evolution of the global financial cycle. Global financial cycles are associated with cyclical movements in capital flows or with booms and busts in asset prices and, therefore, are characterized by large synchronicity in asset prices, gross flows and leverage (Rey, 2013). While the domestic and global financial cycles are constructed around the same notions of financial risks, they also have conceptual distinctions in terms of quantities and financial prices at which they pay more attention. The domestic financial cycles are modelled around credit and property prices and are more relevant to explain banking crisis, while the global financial cycle is modelled around debt and equity swings across borders and financial asset prices (Borio, 2019). The global financial cycle is mostly explained by developments in advanced economies and is usually driven by the monetary policy of a center economy like USA (Cerutti, Claessens, & Ratnovski, 2017).

Empirical evidence from literature has demonstrated that greater financial openness, deeper financial systems, and more rigid exchange rate regimes amplify countries' exposure to the global financial cycle, even though for developing countries, gross capital flows are explained by global common factors to a lesser extent (Barrot and Serven (2018)). The widespread adoption of cryptocurrencies will facilitate at a larger scale the transmission of global shocks to a receiver small economy, making it more difficult for policymakers to contain their negative consequences around crisis times. Such global shocks may be triggered by the perceived changes in the risk profile and soundness of systemically important global stablecoin issuers, or changes in the interest rates they impose (IMF, 2020).

As the crypto-related market size becomes material, it will be important to account for the interactions of the crypto cycles with the other financial market segments cycles, such as the credit, housing, and equities cycles. To date, evidence has shown that overlaps, (particularly when peaks coincide around crisis) can amplify the severity of a crisis in terms of output loss and they can also prolong the recovery phase. For example, credit downturns that coincide with house price busts are longer and deeper than other credit downturns (Claessens, Kose, & Terrones, 2011). It will be therefore crucial to account for such possible interactions for an adequate design and implementation of macroprudential policies.

Under the traditional monetary system, central banks have had to strike a balance between financial stability, price stability and promoting growth by regulating the issuance of money. The central banks' ability to act as a lender of last resort and thus to be able to create infinite amounts of liquidity on demand in order to keep the economy going, has been a stabilizing factor in itself. If such function is lost, a cryptocurrency or stablecoin based monetary system will inherently entail a higher level of systemic risk.

II.3 FINANCIAL STABILITY RISKS FROM SOVEREIGN CBDCS

Central bank digital currencies (CBDC) have the greatest potential to succeed as a mainstream means of payment or store of value, compared to stablecoins and other cryptocurrencies. Lower price volatility, much lower probability of default by the issuer, and easier and secure access make CBDC a more reliable money to transact and to store wealth (see Table 1 in section II.1). Unsurprisingly, the debate among central bankers stands less on the benefits and more on risks associated with the issuance of a CBDC, particularly for financial stability. The benefits are obvious in terms of the efficiency of payments, clearly demonstrated by the growing success of stablecoins, which are privately issued unregulated DC convertible at parity, or other forms of electronic money like Ali Pay. As a payment vehicle, CBDCs and stablecoins have similar features, while in the absence of the former, stablecoins are a strong candidate to become a mainstream means of payment[7].

Central banks face the dilemma, either to regulate stablecoins or compete them with CBDC. Regulating stablecoins raises the public confidence on those private DCs and, therefore, implies taking some responsibility for them without having any control on them. There is a growing list of reasons why central banks might dislike the prospect that a private money become the conventional means of transactions or store of value (see section II.2). The rationale behind all arguments against it is intuitive as one can think of it as a form of dollarization (or stablecoinisation) happening to developed economies. The potential of stablecoins for global appeal may concern, in particular, the international currency issuers like Fed and ECB. It might be an accidental coincidence that the Libra project, initiated by a mainstream social network and backed by major private international financial intermediaries, was abandoned right after the testimony of the Facebook CEO on US Congress[8]. The very idea that a stablecoin may succeed to become

[7] One key difference from CBDCs is that stablecoins are a liability of private sector, similar to bank deposits, while CBDCs are a liability of CBs.

[8] Facebook has replaced the Libra with the Diem project, a less ambitious one when judging by the participating partners backing the project.

a widespread form of money to transact while outside the control of the governments, could be a strong argument in favor of CBDC.

CBDCs have become seemingly an inevitable reality of the future. The increasing interest on private DCs as a means of payment and the growing volume of transactions taking place with stablecoins have gradually pushed CBs to prepare for such an ultimate policy view (Shin, 2021). ECB has already published a report on digital Euro examining the issuance of a CBDC and is launching a two-year project to further investigate alternative designs of a digital Euro (ECB, 2020). Yet, an official commitment by ECB to issue CBDC is left to be made at a later stage (Panetta, 2021). The Fed is also exploring "the possibility of issuing a US central bank digital currency", according to a recent update (FED, 2021). Central banks of other developed economies are investigating potential designs and experimenting on CBDC. Indeed, the number of CBs exploring CBDCs is increasing based on BIS survey of central banks (Boar & Wehrli, 2021).

The main concerns that hold back the official commitment to issue CBDCs are their implications on financial stability, while benefits for the economy are less ambiguous. The question most CBs are facing now is how to optimally design a CBDC, without jeopardizing the stability of the financial system. While changes are inevitable in how the current financial system works and a newly shaped financial system with new financial actors might emerge over time, ring-fencing the stability of financial system requires a smooth and gradual transition. Stability ensures that the key functions of financial system, channeling savings to finance the economic growth and ensuring an efficient payment system, are not disrupted. The implications that a particular design has for financial stability, monetary policy or the real economy of the issuing country, will weigh heavily on how the CBDCs will eventually be designed. Central banks have been pondering or experimenting on the alternative characteristics (BIS, 2021)[9].

[9] See a dedicated chapter by the Annual Economic Report of BIS for an updated version of the debate regarding the design of CBDC (BIS, 2021).

The growing literature on CBDCs seems to agree on the first order effects and the challenges the emergence of a CBDCs raises for financial stability. Both policy discussions and academic research are contributing to the feedback loop that is building up between those first order effects and the CBDC design at this stage. We review the findings from this literature with the aim to summarize where the consensus stands.

- Financial Disintermediation Risk

The most commonly referred risk upon the potential issuing of a CBDC is financial disintermediation risk. It is the risk that retail deposits of FIs will fly towards CBDC, a risk broadly raised by policy papers of international organizations (BIS (2018), BIS (2021)). The accounting effects that potentially lead to disintermediation are emphasized by Sveriges Riksbank, one of earliest CBs with a project to issue CBDC (Sveriges Riksbank, 2017).

Analytical investigation of the potential of CBDC to lead to disintermediation in theoretical settings lean on the positive side of the argument that the risk is manageable given the benefits of CBDC. Caution on one side, the potential for negative effects by undermining credit to economy and bank runs can be present, though a swap of public for private money may preempt choking off credit and crowding out of investments (Brunnermeier & Niepelt, 2019). Similarly, given the monopolistic environment where FIs operate, the introduction of CBDC in such an environment may not necessarily deteriorate the potential of FIs to finance the economy through lending. In such monopolistic frameworks, FIs have room to raise the interest rate on deposits close to MP rate to discourage migration of deposits towards CBDC (Andolfatto, 2021). On a side note, introduction of CBDCs in such environments may just lead to narrower profit margins for FIs, thus promoting intermediation instead.

A critical question arises regarding the remuneration of CBDC holders in order to optimize the impact of CBDC on financial intermediation. The role of interest rate (or remuneration rate) on CBDC is critical for the tradeoff between designing CBDC more

like cash or more a like a deposit (Agur, Ari, & Dell'Ariccia, 2019). A cash-like CBDC that ensures some degree of anonymity may drive cash out of use, while a deposit-like CBDC with remuneration may lead to financial disintermediation. Choosing to design CBDC to address both types of concerns may raise the profile of a "variable" interest rate on CBDC as a policy instrument for CB to respond to implications of CBDC on financial disintermediation.

In theoretical settings, lending interest-bearing CBDCs seem to mitigate the crowding out effects on lending to economy and on private investment (Kim & Kwon, 2019).

As central banks recognize the potential operational risks during the transition period to a regime, among which is the deposit-flight risk to CBDC, an alternative policy approach is a restrictive regulatory frameworks to contain dis-intermediation effects (Barrdear & Kumhof, 2016). The view that regulatory measures are critical to address liquidity runs on FIs, in addition to the variable interest rate on CBDC, is also shared by Andolfatto (2021).

Disintermediation of payment services. The risk that central bank becomes the primary provider of payment services to customers and firms may lead another equilibria where the whole traffic of retail payments concentrates on CB's systems. There is a chance that retail transactions in CBDC grow to dominate other forms of payments driving many FIs out of business. While the flight of deposits towards CBDC and execution of transactions can become easier with CBDC, CBs may end up managing the whole payment business. As a middle ground solution, CBs may delegate some rights to intermediaries by designing a hybrid system where CB take over the wholesale business while FIs deal with the retail business of running the payment business.

In EMEs and LDEs the risk to disintermediation is larger given the shallow financial markets in these economies. In assessing risks that the global adoption of a DC, public CBDC or private stablecoin, the impact on commercial bank deposits will vary based on the risk-return profile of each financial asset, for a given level of household risk aversion. Therefore, the size of the impact

on commercial banks funding risk will depend on (i) the intensity of deposits leaving the banking sector in terms of volume and speed, and (ii) FIs' business model and their levels of liquidity and capital coverage. While it is beyond the scope of this paper to assess the severity of each of these factors, additional risks[10] could lead to unwelcome trends in EME and LDE countries with shallower financial markets due to these two factors.

a) Non-interest bearing current accounts have a higher propensity to migrate, since the main reason for substituting fiat money with digital currency is that the latter being a better means of payment, in LDE and EME countries.
The deposit insurance schemes guarantees depositors only up to a certain level, while FIs' equity is the only hope to cover deposits above the predetermined level. It is reasonable to expect that that portion of uninsured non-interest bearing deposit is even more likely to migrate to a digital currency given that (i) the latter is a more efficient means of payment and (ii) in the case when DC is issued by central banks, it is a much safer to hold deposits at CB than at a private FI[11]. One implication of such a deposit fly towards DCs, is that as more uninsured deposits leave, market discipline pressures toward banks would decline providing a freeway for banks to invest in riskier projects which in turn entails a higher level of credit risk (Mancini-Griffoli et al. 2018). The scale of the problem is large for small economies where non-interest bearing demand deposits make up for a significant amount of the liabilities of the financial system (in Albania they account for 38.8% of total deposits, with 69% of sight deposits being denominated in foreign currency).

b) Deposit migration would alter the funding structure of the FIs which in turn could affect their capacity to intermediate funds to the real economy.
The funding structure of the banks' balance sheet will change

[10] A comprehensive overview of risks arising from currency substitution and bank deposit migration is illustrated in Figure 6 in the Appendix.
[11] A large escape of insured deposits towards CBDC, as a liability of CB, would render deposit insurance as obsolete.

adding pressures on funding risk, liquidity risk and maturity mismatch ultimately weighing on the ***profitability of FIs***. It is clear that less stable and more expensive sources of wholesale funding from the money markets may lead to higher funding costs and shrinking financial intermediation. These pressures of FIs to shrink their activity may lead to the growth of the shadow banking system. Assuming non-bank financial institutions will have the potential to meet such an increased demand, their relative size and importance within the financial system will rise which will contribute to higher endogenous systemic risk since their activity entails higher leverage and risk-taking than traditional banking (Ari et al. 2016)[12].

Furthermore, FIs' profitability would be adversely affected with the wide adoption of a digital currency as income from facilitating payments and from network of customer relationships may be reduced unless they do not come up with new innovative products.

c) Market concentration and reduced competitiveness may follow due to higher market power enjoyed by some of the FIs and a greater degree of vulnerability of smaller ones.
Higher maturity mismatches and the regulatory requirements to meet liquidity (LCR) and solvency (NSFR) ratios, as well as raised pressures on their net interest margins, will force banks to issue long-term wholesale debt (Bank of England, 2021). In the quest for market share in the deposit market as well as access to cheaper wholesale debt, banks that already have a higher market power, will have a competitive advantage.

- Bank Runs

The stability of the financial system is questioned as the CBDCs may become a safe haven when the confidence on the FIs is shattered (BIS, 2020). Bank panics can be triggered by many factors, like trust in an individual FI or in the whole financial system. While the flow of deposits from a liability of FIs to a liability

[12] An example is the case of Albania where the assets of non-bank financial institutions constitute only 4% of total assets within the financial system, with an increasing trend during the last ten years following the Global Financial Crisis when banks' activity has slowed down due to the rising NPLs.

of central banks denominated in CBDC could happen due to unfounded beliefs, the return of those funds to FIs' balance sheet may not take place once those ungrounded beliefs are revealed. The very presence of the CBDC or of foreign currency CBDC may challenge the existing business models of FIs.

- Collateral Scarcity Risk and Credit Risk from wholesale CBDC Funding

Collateral scarcity risk. Facing the prospect that the primary source of funding for FIs, from households or firms, dries up due to the flight of deposits to CBDC, the CB may consider wholesale funding by lending CBDC to FIs. The common practice is to require collateral from FIs in exchange for funds. Lending of CBDC to FIs to undo disintermediation or preempt disruption of lending to economy, may trigger a drastic ***reduction of the amount of liquid assets available*** in the financial market (Grey, 2019).

Credit Risk on CB balance sheet. A second alternative, that CBs accept private securities as collateral (or purchase them) would expose the balance sheet of CBs to credit risk. The measure would be motivated by the necessity to allow FIs maintain a certain stock of government securities to address liquidity needs in the interbank market. The approach would help mitigate the impact on collateral market and allow FIs have sufficient sovereign securities available. In addition, the more risky assets hold CBs in their balance sheets, the greater their involvement in maturity and credit risk transformation, thus exposing CBs to potential public or political pressure and weakening CB independence (BIS, 2018).

For large amounts of deposits migrating to CBDC and equivalent amount of CBDC lent by CB, the amount of private securities in the CB balance sheet, either as collateral or acquired through outright purchases from FIs, will grow proportionally (Williamson, 2019) (Grey, 2019), (Kumhof & Noone, 2019)[13]. The idea will not be unprecedented. Fed and possible other central banks in advanced economies have already injected liquidity in the financial system by

[13] (Williamson, 2019) stresses the benefits of CBDCs in terms of limited criminal activity, interest rate on CBDC as an additional MP instrument and smoothed incentive problem.

accepting private securities as collateral or even purchasing them.

The implications of CB lending CBDC to FIs in less developed economies (LDE) and emerging market economies (EME) with shallower financial markets, exposed to either a local or foreign CBDC are worse.

- The size of the collateral market may be restrictive, limiting CB's policies towards lending large amounts of CBDCs to FIs with the ultimate objective to undo or preempt disintermediation.
- In LDE or EME accepting private securities may be expose CB balance sheets to unacceptably high levels of credit risk because of the ambiguity regarding credit worthiness of private firms.

Finally, the alternative of funding banks with CBDC without collateral as an emergency measure in order to undo disintermediation implies that CB pledges to cover any losses from non-performing loans (NPL) that are not covered by FI equity (Grey, 2019). Currently, those losses are covered by deposit insurance schemes and households themselves.

Exposure of CBs' balance sheet to risk from private firms on a long term basis may jeopardize the trust in the currency and undermine financial and monetary stability.

- Anti-competitive practices

There is a risk of anti-competitive practices due to a vicious circle of data storages in the hands of a singular financial intermediary that may gain market power in managing transactions denominated in CBDC (Shin, 2021)[14]. The risk is similar in case BigTech companies issue stablecoins. Due to the advantages provided by large social networks and access to a large databases, some BigTech companies may dominate the payment markets once their stablecoins are in circulation. A similar effect can be achieved with biggest players in the traditional financial markets. If FIs are to intermediate and record retail transactions made with CBDC, those

[14] A similar risk is present in a stablecoin arrangement.

with the largest branch networks or similar advantages due to larger customer databases, may end up accumulating larger databases of recording of retail transactions with CBDC. Such advantages may be used to dominate the market and play out smaller FIs.

- Spillover effects across countries or cross-border effects

Cross-border implications are a topic that have received less interest compared to the disintermediation risk. The latter is a greater concern to CBs issuing CBDCs while the former is of a greater interest to LDEs and EMEs. While the payment system and money issuance remain a domestic issue, emergence of CBDCs has international implications. Allowing foreigners to hold CBDC may amplify capital flight shocks on vulnerable economies. Similarly, small shocks on exchange rate and asset prices could be magnified due to instant access on a CBDC serving as a safe heaven (BIS, 2018). A counterview is that the above argument may overstate the role of CBDC for currency substitution in vulnerable economies with current levels of dollarization of financial assets. Whatever the macro or institutional reasons for the presence of dollarization, foreign CBDC may simply aggravate the trend, though it cannot be the culprit behind it (Carstens, 2021). When present, the risk can be addressed via restrictions by the CBDC-issuing CB and also by the regulatory restrictions of host countries (BIS (2018), BIS (2021)). Same restrictions on the access of CBDC by the issuing country and other regulations by host ones seem to mitigate the implications of international transmission of MP and technology shocks in a theoretical setting (Ferrari, Mehl, & Stracca, 2020).

Applying regulatory restrictions onto the access of CBDC by foreigners may not be a long-term solution. Ultimately cross-border effects could turn out to be larger than what is currently thought. While it is true that regulatory restrictions can contain the cross-border effects in the short term, over the medium term the competition among CBDCs for international reserve currency may lead to a gradual lift of those restrictions by issuing countries. In addition, once restrictions to access are lifted, it may take very harsh restrictions, probably with strong downside risks, by the host countries to limit the fallout.

III. POLICY APPROACH TO ADDRESS RISKS FROM DC

Good governance drives competition and innovation which further promote growth. Legal and regulatory framework that ensure a level playing field are key to lend trust to a reshaped financial landscape. A proper design of the regulatory frame by the national authorities will need to strike a balance between opportunities for innovation and resiliency of the financial system as the digital revolution reshapes the system. On one side, private sector participation is also essential for the efficiency of the financial system. On the other, so is monitoring by the public sector to guarantee accessibility of the digital products and resiliency of the system. Joint cooperation between standard-setting organizations, public institutions and private sector players is key to strike the balance.

III.1 CURRENT APPROACHES

There is a strong urgency for international standard-setting organizations and national authorities to address all those risks that threaten financial stability. One form of cooperation is to regulate and supervise those activities to contain risks without jeopardizing the innovative products and services enabled by those private DCs. The alternative is to come up with public digital currencies that can provide the similar innovative financial services. Currently the efforts are put forward towards both these approaches. Gradually, standard-setting organizations are focusing on providing guidance, standards and principles on how to supervise financial institutions exposed directly or indirectly to such cryptoassets while their market capitalization is small. The approach aims at containing the risks from exposure to private cryptoassets while allowing private actors to push forward with innovative practices and products. On the other side, national authorities are investigating the optimal design of public digital currency that allow efficient monetary and macroprudential policies. Standard-setting and international organizations are coordinating some of these efforts.

In reshaping the regulatory landscape, a starting point for the standard-setting bodies is to assess the potential of the existing standards to develop new policy recommendations for private digital currencies. The existing regulatory and supervisory frameworks may apply to a certain degree to address risks related to private digital currencies or to entities exposed to them. A typical approach follows by (1) identifying the activity performed through the use of private DCs and the participants, and (2) applying the existing regulatory framework for that activity based on the principle "same business, same risks, same rules". It implies holding these activities and participants to similar standards to those applied on other forms of private money (Segal-Knowles, 2021). Rules that regulate the offering of private money on a systemic basis can be applied as such.

Following a G20 request, the FSB has issued a set of recommendations build upon the standards of BCBS, FATF, CPMI and IOSCO that could guide national authorities in addressing supervisory challenges related to private digital currencies and in particular to stablecoins[15]. Similarly, a G7 working group on stablecoins (2019) recommends that cross-national cooperation is critical to address cross-border risks form stablecoins and ensure consistent regulation across countries.

At the same time, the G7 Working Group recommends the public authorities at national level should cooperate to come up with roadmaps to support the improvements of payment and financial services. The efforts should focus on (i) improving cross-border payment, (ii) promoting financial inclusion, and (iii) establishing cooperative oversight arrangements among national authorities to improve on supervisory practices.

Key to the efforts to contain the risks from further spread of private digital currencies are the initiatives emphasized by some of the standard setting institutions. National regulatory and supervisory authorities are expected to follow these guidelines over time.

[15] See the Appendix for a summary of acronyms of international organizations used in this document.

- Financial Action Task Force (FATF) has one of the most comprehensive approaches taken by employing its existing anti money-laundering and counter financing of terrorism (AML-CFT) framework as a tool that enables regulators to limit risk exposure of FIs' balance sheet towards cryptoassets. Their approach is broadly led and supported by the Group of Seven (G7).
- The Basel Committee on Banking Supervision (BCBS) has taken a very cautious approach towards any possible adoption of cryptoassets on the financial activity of banks and financial institutions.
- BSCB has warned FIs to be very conservative towards providing financial services related to digital cryptoassets or providing services to crypto-related businesses.
- Financial Stability Board (FSB) takes stock from monitoring the growth of cryptoassets as an indicator of the potential threat of cryptocurrencies to financial stability.
- Closer to the region, ECB has not taken any new regulatory initiative to address risks to euro area's financial system from cryptoassets. So far risks from the cryptoassets are low due to small scale of adoption of these unregulated DCs. Instead, ECB has expanded the scope of its existing regulatory frameworks not only to align them with the AML-CFT guidelines, but also to ensure consumer and investor protection, as well as market integrity (Adachi, Cominetta, Kaufmann, & van der Kraaij, 2020).

III.2 KEY CHALLENGES FACING REGULATORY INSTITUTIONS

The risks from adoption of digital currencies vary across the types of DCs. In private DCs, cryptoassets and stablecoins, those risks are much larger than in the currently regulated networks of financial activity. While private DCs remain a liability of private agents, the attached functions of unit of account, means of payment and store of value to these kind of liabilities amplify the typical credit, market and liquidity risks observed in other financial markets.

a) Given the desirable characteristics that distinguish stablecoins among many other cryptocurrencies, their use is expected to grow. Having at the same time a unit of account role attached to its core payment vehicle and store of wealth functions, makes stablecoins a growing challenge for the regulatory and supervisory authorities to be dealt with. To harvest the benefits of stablecoins in terms of the efficiency in payments without undermining financial stability, it is essential that stablecoin arrangements are designed to comply with the existing principles that promote financial stability. How can regulators address risks from failure of stablecoins to maintain its function as a unit of account or from remaining in circulation at all? The current approach by standard-setting organizations suggesting national authorities take a middle ground by applying existing regulatory frameworks may be too little to limit the fallout in the future.

b) A much greater risk would pose a private DC issued by BigTechs with large platforms that could scale the adoption of their DC through a much larger customer reach and offer an easily accessible platform. It is due to the advantage of larger customer base that the DC of a BigTech has the potential to overhaul the overall payment system and through it aim to become an international currency (BIS, 2019). With such a global reach BigTech DCs may become a threat for the domestic currency financial sector particularly of those fragile economies with yet underdeveloped financial markets. In a similar way, they could facilitate cross-border transmission of shocks. An effective policy approach towards these DCs is through the cooperation of international standard-setting organizations and national authorities to address those risks right at the designing phase of such initiatives.

c) Finally, public DCs, or as broadly known CBDCs, are not yet a common form of money in circulation[16]. Various issues are being investigated by national authorities, mainly CBs. Critical issues that require strong international cooperation are those related to cross-border operation of CBDC. For standard-setting organizations the cross-border use of account-based CBDCs would be particularly challenging. Unlike token-based CBDCs, the former require the share of digital ID information outside the originating country. Different data-protection regulations may inhibit the information sharing by CBs due to data privacy issues. A typical promising approach is mutual recognition of national ID credentials, which may in turn force a gradual convergence of data protection regulations towards a universal version (BIS, 2021).

IV. A PERSPECTIVE ON ALBANIAN ECONOMY

Crypto-assets do not represent an important source of systemic risk yet, due to their limited size compared to traditional financial assets, their limited use for payment services and their low interlinkage with the regulated financial institutions in terms of exposures (ECB, 2021). However, the status-quo of a banking centered financial system, with all the safeguards provided by a central bank serving as a lender of last resort may be challenged in case people and markets convert to widespread use of private forms of digital money. This scenario would certainly have implications for financial stability and the role of the central bank in this regard.

[16] One exception is "Sand Dollar", the retail CBDC of the island nation of Bahamas. Sand Dollar is the digital type of the Bahamian dollar (B$). It is issued by the Central Bank of The Bahamas through authorized financial institutions (see https://www.sanddollar.bs).
A CBDC-like platform for next-Generation Mobile Payments on a blockchain platform is also launched by the Central Bank of Cambodia. While it is only based on fiat currency rather than a proper CBDC, it shares many CBDC features that allow users faster and cheaper payments (https://bakong.nbc.org.kh/en/).

Global developments in the crypto area will sooner or later have implications for an open economy like Albania. The main risk in the form of currency substitution comes mainly from the potential affirmation and widespread use of global stablecoins[17]. Global stablecoins could be the closest substitute to fiat currency, due to their stabilizing mechanism which does not allow for high volatility as seen in several cryptocurrencies with floating prices. Price stability is a precondition to be met for a currency to be used widely as a means of exchange or a store of value.

So far, the issuing and use of stablecoins is at its early stages and there is no systemic stablecoin in any country. That is why it is not possible to foresee with any certainty the level of trust citizens will have with regard to the new forms of digital money and to what level they will substitute fiat money. Moreover, the landscape around cryptocurrencies is evolving rapidly with new financial service providers and instruments becoming active, which will impact the level of endogenous risks inherent to such activities. In case the risk of currency substitution and bank disintermediation materialize, one potential implication during a transitional phase is that deposits migrate away from the regulated banking system. In the longer term, the financial system will adjust to the new realities through the usual forces of innovation and competition, and such adjustments will become more apparent as the new forms of money emerge on a systemic scale.

As cryptocurrencies enter the financial scene, new vulnerabilities arise. The introduction and widespread use of private stablecoins will not only limit monetary sovereignty of the central bank, but also carries risks inherent to the ability of the issuers to meet the stability promise of their coins[18]. Despite the operational, market and liquidity risks inherent to the business model of a stablecoin

[17] Stablecoins with a potential reach and adoption across multiple jurisdictions and the potential to achieve substantial volume (FSB, 2020).

[18] Loss of monetary sovereignty could trigger: a) long-term periods of high inflation; b) exchange rate depreciations, which would limit the country's ability to import and export in its own currency and hence increase the country's foreign-denominated debt; and c) a subordination to a foreign country's monetary policy. The currency substitution process is eased by fractional reserve banking systems, which are linked by international correspondent banks (Viñuela, Sapena, & Wandosell, 2020).

(FSB, 2018-b), additional vulnerabilities arise in the context of a small, open and euroized economy. The IMF report on macro-financial implications of digital money across borders, argues that global stablecoins have the potential to increase the intensity of currency substitution in countries that already have a relatively high degree of dollarization/euroization level and in such case it could amplify the vulnerabilities with respect to funding and solvency risks (IMF, 2020). Financial euroization of banking system balance sheet is relatively high in Albania. Around 50% of deposits and loans are denominated in foreign currency[19]. As new forms of digital money are not yet widely used in any economy, it is difficult to predict the level of demand for stablecoins with any certainty. However, at this phase, we can discuss how the main characteristics of a stablecoin may shift the main drivers of traditional currency substitution in Albania (euroization) towards a certain form of stablecoinisation.

The promise of being a better means of payment would probably be the main reason that could lead to additional currency substitution in Albania. This is in line with theory that the leading function of a global currency is to serve as a means of payment in international trade (Cœuré, 2019). The promise of stablecoins technology to provide faster, easier and cheaper cross-border payments, will give them a competitive advantage to fiat money and existing payment channels, particularly for incoming remittances in Albania. The same competitive advantage could be exploited by economic agents in international trade. The use of stablecoins in exchanging goods and services abroad could be imposed to Albanian businesses, especially if the foreign providers of those goods and services would have embraced the use of payment services based on distributed ledger technologies.

[19] Studies conducted by Tase (2005); Manjani (2014); G. Della Valle et al. (IMF, 2018) confirm that all forms of euroization are present in Albania, despite an environment of restored overall macroeconomic stability with exchange rate stability and very low inflation, which theoretically would reduce the value of holding foreign currency as a store of value.

Albania has a bank-centric financial system with underdeveloped financial capital markets. As such, global stablecoins could provide easier access to global capital markets, through a wide variety of FinTech solutions with lower market frictions in cross-border capital flows. This can potentially increase capital flows volatility which may have implications for exchange rate stability and domestic financial conditions in general, especially if such capital flows are material and one-sided (IMF, 2020). The high level of trade openness as well as the EU integration process will also impose network effects from developments outside the country.

Demand for stablecoins will also depend on other factors, despite the ones that have traditionally driven currency substitution in Albania:

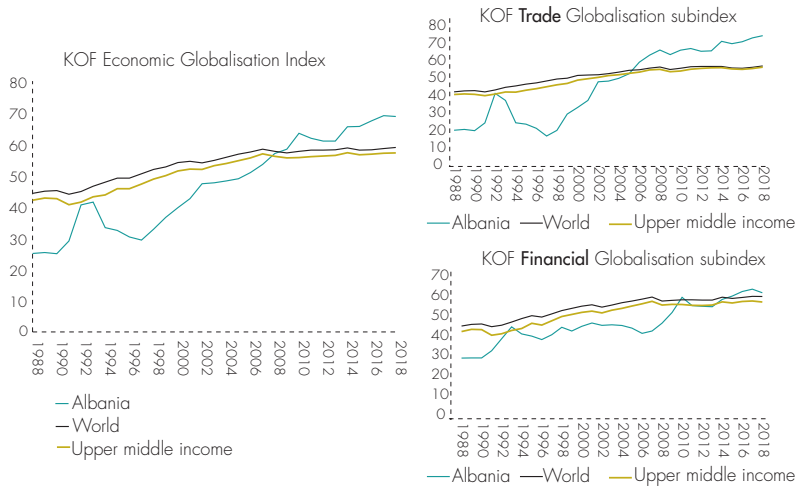
- The speed of development of e-commerce, which requires an online payment infrastructure that works across borders and is more efficient to use, a phenomenon greatly boosted during the Covid-19 crisis.
- Stablecoins issued by BigTechs with international reach, could also make it easier for the Albanian public active in social media platforms to have preferential access on their extra financial services (loans, advice etc.).
- And last, but not least, many people may find it easier with less costs to set up a relationship with crypto- financial services providers compared to traditional financial institutions.
- This will potentially enhance financial inclusion, but careful consideration of customer protection regulations is needed to be put forward.

IV.1 KEY FACTS ABOUT ALBANIAN ECONOMY

Albanian economy and its financial system have become progressively more integrated internationally, as indicated by the increased level of the standardized KOF economic globalization index. As of 2018, Albanian economy is ranked in the 72th

percentile with regard to the level of economic integration in a pool of 190 countries. Economic globalization index represents a category with the highest score compared with social integration (51th percentile) and political integration (45th percentile). The main driver of economic integration has been trade, which during the last decade has outpaced the average level of similar developing upper middle income countries.

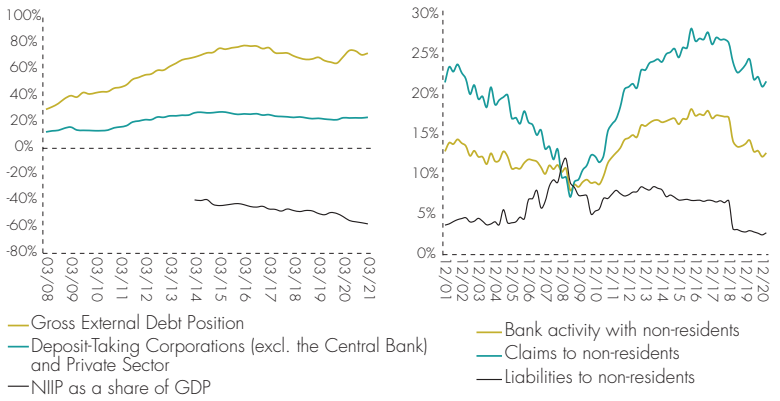
Figure 2 Albanian economy global integration as measured by KOF Globalization Index



Source: KOF Globalization Index database, available at https://doi.org/10.1007/s11558-019-09344-2

Albania has increased its gross external debt position, maintains a negative and deepening net international investment position and is characterized by a high presence of foreign capital commercial banks. There are 12 commercial banks operating in Albania, with 8 foreign-owned banks accounting for 69% of total assets. The banking sector has maintained a net crediting position toward non-residents most of the time during the last two decades. As of March 2021, 13% of bank activity is related to non-residents, with claims to non-residents giving the main contribution.

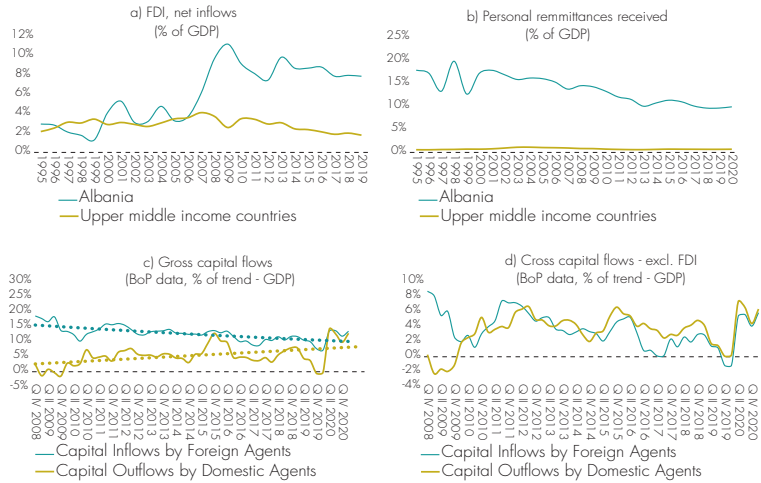
Figure 3 Albanian gross external debt and banking sector international activity



Note: Bank activity with non-residents is measured as [(non-resident assets + non-resident liabilities)/ (total assets + total liabilities)].
Source: Bank of Albania.

Albanian capital inflow exposure, the share of net foreign direct investment flows plus remittances as a percentage of GDP, is ranked among the top tercile in a pool of 143 countries (World Bank Group, 2020). Such high capital exposure makes Albania vulnerable to capital flights during a crisis, as investors seek to relocate funds to safe-haven countries, while at the same time migrants living abroad and providing a significant source of income are the most vulnerable to unemployment. FDI inflows and remittances have maintained a decreasing trend after the global financial crisis, even though their ratio to GDP is relatively high compared to the upper middle income countries. Gross capital flows are positively correlated to business cycles. Such correlation is stronger (around 17%) when FDI investments are excluded. Indeed, portfolio and other investments have a higher degree of liquidity, are shorter-term investments and they tend to display sharper reactions around crisis events such as the global financial crisis and Covid-19 crisis.

Figure 4 Some indicators of cross-border capital flows



Note: a) Capital inflows by foreign agents (CIF) is the sum of direct investments of foreigners in Albania, portfolio investment liabilities, financial derivatives liabilities and other investment liabilities; b) Capital outflows by domestic agents (COD) is the sum of direct investments of domestic agents abroad, portfolio investment assets, financial derivatives assets, other investment assets and international reserve assets; c)Trend-GDP is calculated using Hodrick-Prescott filter, using a smoothing parameter of 1600 to quarterly GDP data.

Source: World Bank Database, Bank of Albania and author calculations.

Greater financial openness and deeper financial systems amplify countries' exposure to the global financial cycle. On top of this, widespread adoption of cryptocurrencies has the potential to make a small receiver economy like Albania more vulnerable to global shocks, leaving less room for policymakers to effectively manage crisis events.

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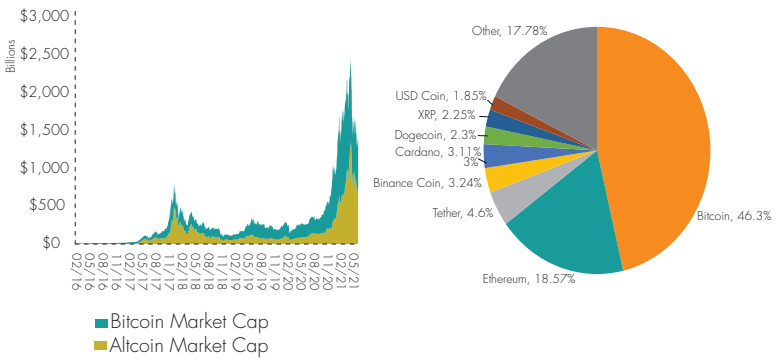
APPENDIX

ACRONYMS

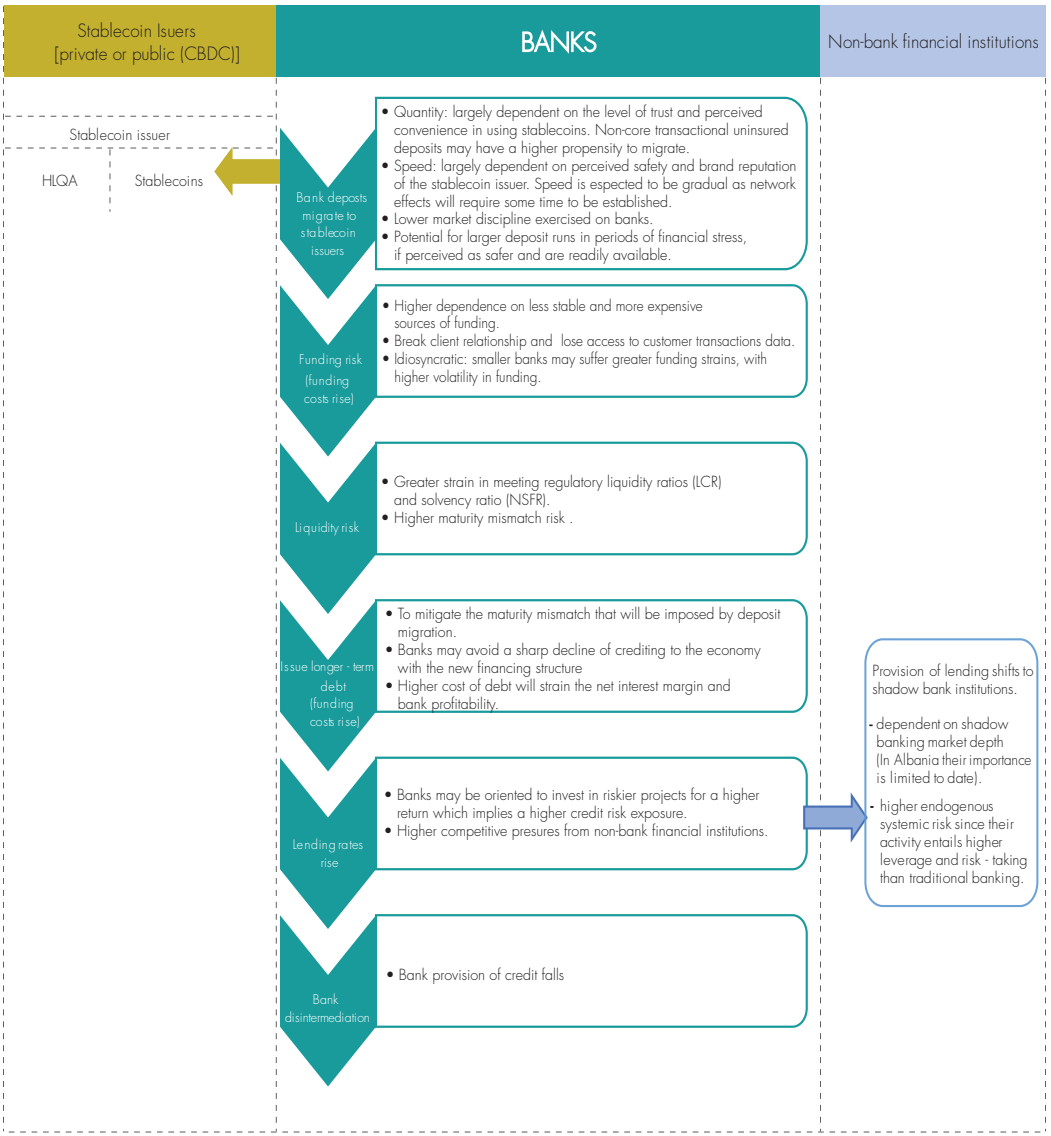
BCBS	Basel Committee for Banking Supervision
CPMI	Committee for Payment and Market Infrastructure
FATF	Financial Action Task Force
FSB	Financial Stability Board
IOSCO	The International Organization of Securities Commissions

Figure 5 Cryptocurrencies by market capitalization



Note: Data as of July 1, 2021. "Altcoin" refers to all crytocurrencies other than Bitcoin.
Source: coin.dance.

Figure 6 Overview of risks arising from currency substitution and bank deposit migration



Source: Authors.

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