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# Stablecoins

An Introduction and Recommendations for the European Union

Private Digital Euro Working Group

**Digital Euro Association** 

## Digital Euro Association Private Digital Euro Working Group

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#### Abstract

How will Euro stablecoins fit into the landscape of digital money in the future? This paper reviews the various design choices and features of stablecoins, how stablecoins would interact with CBDCs, and the legal and regulatory framework required to support the introduction of stablecoins in the eurozone and the global financial system. The paper concludes with well-considered recommendations. The outcomes are particularly aimed at those policy-makers involved in EU crypto and stablecoin regulation.

<sup>\*</sup>The views expressed in this paper are the authors' own and do not necessarily reflect the views of their employers or the Digital Euro Association (DEA). The DEA would like to thank its supporting members, whose support was instrumental in making this work possible.

## List of abbreviations

AML	Anti-Money Laundering
AMDL5	Fifth EU Anti-Money Laundering Directive
API	Application Programming Interface
AaaS	Asset-as-a-Service
BIS	Bank of International Settlement
BUSD	Binance USD
CASP	Crypto Assets Service Provider
CBDC	Central Bank Digital Currency
CDD	Customer Due Diligence
CFT	Combating the Financing of Terrorism
DEA	Digital Euro Association
DLT	Distributed Ledger Technology
DvP	Delivery versus Payment
ECB	European Central Bank
ECON	European Parliament Committee on Economic and Monetary Affairs
elDAS 2	Electronic IDentification, Authentication and Trust Services
EU	European Union
EEA	European Economic Area
EURO1	EBA CLEARING Company
FATF	Financial Action Task Force
FinTech	Financial Technology
FSB	Financial Stability Board
FX	Foreign Exchange
GSC	Global Stablecoin
IMF	International Monetary Fund
IoT	Internet of Things
KYC	Know-Your-Customer
MiCA	Markets in Crypto-assets Regulation
MiFID	Markets in Financial Instruments Directive
MiFID2	Markets in Financial Instruments Directive 2
NCB	National Central Bank
PoS	Point of Sale
PSD2	Revised Payment Services Directive
PSP	Payment Service Provider
SEPA	Single Euro Payments Area
SCA	Strong Customer Authentication
SCT	SEPA Credit Transfer
SWIFT	Society for Worldwide Interbank Financial Telecommunication
TARGET2	Trans-European Automated Real-time Gross Settlement Express Transfer System
USA	United States of America
WEF	World Economic Forum

## Foreword

Since the Digital Euro Association's Private Digital Euro Working Group started writing this paper at the beginning of 2022, the world of stablecoins has changed more dramatically than any of us could have imagined.

The 'de-peg' event that many of us had feared occurred in the third week of May 2022 when TerraUST spectacularly lost its peg against the US dollar and shook the crypto sphere to its foundations. There has, predictably, been a call within the European Union (EU) for greater regulation of crypto in general and stablecoins in particular. Still, the level of confusion around stablecoins has only increased as policymakers, regulators and market participants navigate their way into a new era. In this paper, we endeavor to bring some clarity to the discussion.

The word 'stablecoin' means different things to different people, and we start by sharing our definition. Some observers bucket all stablecoins together, whereas others attempt to divide stablecoins based on their use cases, their collateral composition, or their reserve's transparency. Next, the design choices and features of stablecoins and how they might be used are analyzed, and we consider the types of programmable payments that could be enabled. The technical and policy designs offer risks and opportunities for policymakers and analysts to regard.

Stablecoins are often discussed alongside central bank digital currencies (CBDCs) but they will never be the same instruments, and it could be that a euro CBDC would act as a reserve for a future eurozone stablecoin.

Finally, we look at the regulation and consider the unwieldy and complex framework that has made the Markets in Crypto-assets (MiCA) regulation such a dilemma for European policymakers and lobbyists alike.

Europe's desire to be a hub for digital innovation and enterprise will only be met when the decentralized internet pioneers feel they can thrive within the EU. A euro stablecoin should certainly be an option on the table as a new era unfolds.

Chris Ostrowski Dr.Oriol Caudevilla **Chairpersons** 

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## 1. Introduction to stablecoins

Over the last few years, stablecoins have grown in popularity and many believe their role in the future financial system to be profound. Towards better understanding stablecoins it is important to accurately define them, understand their interaction with the current financial system, and explore their value propositions.

To frame this discussion, we have modified the "money flower" originally proposed by Bech & Garratt (2017). This graphical representation classifies different forms of money based on their specific criteria. Money can be issued and held in digital or physical form. It can be exchanged peer-to-peer or via a centralized system and can be issued by a public institution (e.g. central bank) or a private corporation. In contrast to Bech & Garratt (2017), who use 'universally accessible' as one of the four features, we use 'convertibility with fixed exchange rate'. In our modified "money flower" (Figure 1) stablecoins are characterized by the following features: they are a private form of money, having a private issuer; they are convertible (for example, they can be converted to a fiat currency, e.g., USD), and they are digital in nature since they are typically (although not always) built on distributed ledger technology. As they are usually based on a distributed ledger, they are transferable peer-to-peer. In our version of the money flower, we consider stablecoins to be universally accessible because existing stablecoins are. One could of course also think of stablecoins that are not universally accessible, like b2b-stablecoins for example.



Figure 1: The 'money flower' (based on Bech & Garratt (2017))

#### 1.1 Definitions

In the most general definition, most stablecoins are privately issued tokens having a value that is tied to an underlying asset or basket of assets. This could take the form of more traditional government-issued (fiat) currencies, one or more cryptocurrencies, a commodity (e.g. gold), or a basket of these or even a combination of multiple asset types. In this sense, stablecoins are intended and structured to provide value stability – not relative to general price levels, but relative to the underlying asset(s). The issuer designs and structures the stablecoin such that its value is effectively pegged to the aforementioned underlying asset(s). Stablecoins can be issued by a centralized authority or using a decentralized system. Whilst many are built on distributed ledger technologies such as blockchains, they can also be implemented using traditional technologies.

The crucial distinction between stablecoins and other forms of currencies becomes clear when they are examined in the context of the "money flower" (Figure 1). Stablecoins are digital, non-public, peer-to-peer currencies with a fixed exchange rate to one asset or a basket of assets. This makes them a whole new asset class, different from cryptocurrencies without a fixed rate of exchange, or public central bank digital currencies.

The topic of transparency has gained considerable attention recently, for reasons that shall be explored further in this paper. Transparency can be assessed at different levels. At the most fundamental level, stablecoin transparency involves understanding and having visibility of the mechanism for collateralization and valuation of a given stablecoin. At the transaction level, it is relevant to consider the extent to which each transfer is recorded on a public blockchain, for example, or whether user information is attached to individual transactions. Stablecoins can have varying degrees of transparency when it comes to their backing, governance and privacy. This depends on the degree of auditing, the ways in which collateral is managed, and the technology used to record transactions.

#### Types of stablecoins

The high price volatility of cryptocurrencies led to the emergence of the concept of stablecoins since they are pegged to one or more reference assets. At present, stablecoins are predominantly used as a medium of exchange to allow market participants to move in and out of cryptocurrencies, as a protection in times of market turmoil, to arbitrage price differences between exchanges, and to operate within decentralized finance applications. Nevertheless, further use cases – e.g. for peer-to-peer international payments – are emerging. Beyond their common characteristic of the price being pegged to another asset or basket of assets, stablecoins can differ substantially in terms of their: economic design and structure, the quality of backing and collateralization, underlying stability assumptions, and the legal protections afforded to holders and users of the stablecoin.

The following are the most common types of stablecoins currently in circulation (although it should be noted that new types of stablecoins are constantly emerging):

**Fiat-backed stablecoins** dominate the market. They offer an easy to understand approach as their price is pegged to the value of a particular fiat currency (e.g. US dollar, euro, etc.) or a basket of fiat currencies. The issuer promises to exchange the stablecoin for the fiat currency on a 1:1 basis and undertakes to hold the corresponding amount of fiat money or

liquid equivalents (such as short-term notes and other short-term "cash-equivalent" assets) as collateral. As of today, the most popular versions of fiat-backed stablecoins are based on the US dollar. The coins with the highest market capitalization are currently USD Tether (USDT), USD Coin (USDC) and Binance USD (BUSD).

**Commodity-backed stablecoins** are backed by a commodity or a basket of commodities and typically require a custodian for safekeeping. They are most often used as a means of investment rather than a means of payment. For example, market participants are able to invest via commodity-backed tokens in gold or other precious metals without the need to store or transfer the commodities themselves.

**Cryptocurrency-backed stablecoins** are backed by a single cryptocurrency (e.g. Bitcoin, Ethereum, etc.) or by a basket of cryptocurrencies. In practice, these types of stablecoins are overcollateralized as cryptocurrencies regularly show a high degree of price volatility. The largest cryptocurrency-backed stablecoin by market capitalization is DAI (MakerDAO).

**Algorithmic stablecoins** use a complex algorithm to manage the peg to a reference asset (e.g. US dollar) by automatically adjusting (burning and minting) the supply and demand of the stablecoin. Unlike other types of stablecoins, they do not require any reserves to be held, as their value is managed through the control of tokens in circulation.

The recent turmoil in the crypto market has been challenging for stablecoins. While fiat-backed stablecoins like USDT or USDC were able to retain their peg despite the high volatility in the overall crypto market, the algorithmic stablecoin TerraUSD infamously broke its peg and lost its value entirely. As already mentioned, US dollar-denominated stablecoins currently dominate the market. The prominence of the US dollar's position in the stablecoin world is likely a reflection of the currency's dominance in international finance, its status as the world's reserve currency, and its liquidity. However, a full discussion of the US-dollar dominance in stablecoins is beyond the scope of this paper.

#### 1.2 Stablecoins and commercial banks

Stablecoins can be relevant for the banking sector in two ways:

- 1. As a privately issued form of money and a store of value that offers no interest payments but also offers reduced costs and transaction fees, stablecoin issuers are potential competitors to banks in terms of the products and services that they can offer to customers and users.
- 2. Stablecoin issuers can create services specifically aimed at people who either do not have access to the existing banking system, or who want to exit the banking system. These people may be incentivized to use stablecoins for a variety of reasons including: their facilitation of peer-to-peer transactions, the removal of intermediaries, easy access to decentralized apps and decentralized finance, but also (perceived) anonymity, tax avoidance, and bypassing existing money laundering regulations.

As far as the store of value is concerned, a study by the Federal Reserve Bank predicts that a proportion of the banknotes in circulation will be replaced by stablecoins pegged to the US Dollar since stablecoins are seen as a digital substitute of cash. The same study also discusses the possibility that stablecoins reduce commercial bank deposits if households see stablecoins as an attractive alternative and stablecoin issuers have direct access to central bank money. This could lead to a decline in credit provision by commercial banks, resulting in higher costs of credit and financing for banks, with knock-on economic impacts (Liao & Caramichael, 2022).

When it comes to financial inclusion, stablecoins can provide access to a medium of exchange and a store of value for those without access to the conventional banking system. The question would of course be, how people without access to the banking system can initially convert their resources into stablecoins. Stablecoins could also be a means to reduce the barriers existing between traditional fiat currencies and their corresponding banking systems and therefore be beneficial for international trade. In the case of stablecoins that are not subject to supervision by financial authorities, a number of potentially dangerous problems could arise. Apart from potential issues like money laundering, financing of terrorism, and drug trade, lacking supervision also puts users of stablecoins at risk of fraud. Even though stablecoins have put emphasis on transparency in recent times, with examples being the monthly audits of reserves of USDC (Centre, 2022) and BUSD (Binance, 2022), the actual holdings, their liquidity and the legal status of the commitment to the peg are still very opaque for many stablecoins. Recent events have also shown the dangers that can arise if algorithmic stablecoins are not properly configured. If stablecoins continue to grow in market size, the damage of fraudulent behavior of issuers of stablecoins could expand from the crypto market into the regular financial system.

#### 1.3 Stablecoins and unpegged crypto assets

Stablecoins have become an important part of the cryptocurrency world. As of July 2022, USDT is the third-largest cryptocurrency by market capitalization (Coinmarketcap, 2022). Another stablecoin, USDC, is currently ranked fifth in terms of market capitalization. In terms of the daily trading volume, USDT is the leading cryptocurrency (Coinmarketcap, 2022). BUSD, another stablecoin, and USDC are also amongst the most traded cryptocurrencies.



Figure 2: Average daily trading volume of the most traded cryptocurrencies in August 2022 (Source: Coinmarketcap.com)

One could argue, however, that the difference between 'classic' cryptocurrencies (Bitcoin, Ethereum, etc.) and stablecoins are so large that stablecoins constitute a form of digital currencies that is distinct from unpegged cryptocurrencies. The features users value in stablecoins are, in some cases, diametrically opposed to those valued in unpegged cryptocurrencies. The most prominent feature of stablecoins is their stability in value relative to the underlying asset, which is the US-Dollar for the vast majority of current stablecoins. In contrast, volatility is valued for cryptocurrencies. As seen in Figure 3, for cryptocurrencies there is a weak positive correlation between volatility and market capitalization which can be explained by viewing cryptocurrencies as a speculative object of investment. In this case, higher volatility allows for higher possible returns and is thus seen as favorable. It is therefore understandable that the issuers, be it centralized authorities or decentralized issuing mechanisms, might have other incentives than to limit volatility. We would argue that the two most important use cases of cryptocurrencies are that of a speculative object and that of a specialized currency for a clearly defined and limited environment.



Figure 3: Volatility and market capitalization of selected cryptocurrencies, average over January 2016-February 2022 (Source: Coinmarketcap.com, own calculations)

For stablecoins, the case is different as can also be seen in Figure 3. The most successful stablecoins have so far managed to stay very close to their set price goal and are valued for their relative price stability and not their volatility. We distinguish two main use cases for stablecoins: First, as a medium of exchange and second, as a store of value. As seen in Figure 2, the stablecoin USDT is by far the cryptocurrency most widely used for transactions. Although BUSD and USDC are also among the ten most exchanged cryptocurrencies, their trading volume is dwarfed by that of USDT. This is particularly interesting as USDC has recently caught up to USDT in terms of market capitalization (Figure 4). This is however not visible when looking at its transaction volume.

We therefore conclude that USDC and also BUSD, which is similar to USDC in that respect, are not primarily used as a medium of exchange but as a stable store of value. The demand for a reliable store of value, especially one that is easily accessible with cryptocurrencies, also becomes apparent when looking at times when the crypto market is in distress. As a study by the Federal Reserve Bank points out, stablecoins are seen as a digital safe haven during these periods which manifests in increasing demand for and price of stablecoins (Liao & Caramichael, 2022). These deviations from the peg are however only observed in the short-time and are usually countered, either actively by the issuers of the stablecoins or algorithmically. In this regard, stablecoins can have a stabilizing effect on the crypto market as a whole as they prevent users from exiting the crypto market in times of turmoil. On the

other hand, given the crucial role of stablecoins and especially USDT for the exchange of cryptocurrencies, the collapse of one stablecoin, e.g., due to insufficient reserves could severely destabilize the cryptocurrency market, a concern that is also voiced by the Financial Stability Board (FSB) (Financial Stability Board, 2022).



Figure 4: Market capitalization of top stablecoins in August 2022 (Source: Coinmarketcap.com)

#### 1.4 Stablecoins and central bank digital currencies

As most of the current stablecoins are pegged to the US Dollar, they can be perceived as a digital form of the US Dollar, even though they are privately issued. In a study by the Federal Reserve Bank, fully backed stablecoins are labeled a "pass-through central bank digital currency" (Liao & Caramichael, 2022). The same study discusses the problem of a potentially destabilizing effect on the financial system if, in a period of financial stress, large amounts of commercial bank deposits are moved toward stablecoins, which can be seen as synthetic CBDCs if they are fully backed by central bank money. In that case, commercial banks would be put under additional pressure and limit credit provision, which could then impose further harm on the economy. It is therefore an important factor if the issuers of stablecoins have direct access to central bank money or if they rely on commercial banks for their deposits.

Whilst single-currency backed stablecoins and CBDCs are indisputably related to each other, there are also some key differences between them. The most notable difference is that a CBDC represents a direct claim on the central bank, whereas a single-currency backed stablecoin represents only a claim on the private issuer. Below, we attempt to untangle the relationship and meaning of different types of digital fiat money:

- CBDCs are digital currencies that are issued by the central bank, representing a direct claim on the central bank, and are thus most similar to cash as a public form of money.
- Synthetic CBDCs are private digital currencies that are fully backed by central bank money and regulated and supervised by the central bank.
- Pass-through stablecoins are private digital currencies backed by central bank money.
- Stablecoins like USDC are private digital currencies backed by private (bank) money, commodities, cryptocurrencies or algorithmically.

#### 1.5 Unique selling propositions of stablecoins

Having provided a brief overview of stablecoins, the various types of stablecoins that exist, and the similarities and differences between stablecoins and other types of money or assets, we will conclude by summarizing the key advantages of stablecoins relative to CBDCs, existing commercial bank money, and unpegged cryptocurrencies.

Stablecoins are digital-native and are usually (although not always) built on DLT. This can enable users to settle transactions almost instantaneously, and without the risk of double-spending or the need for an intermediary. On public blockchains, transactions may be executed and completed at any time, regardless of weekends, bank holidays and office hours. Use of DLT enables stablecoin issuers to incorporate additional functionality, such as programmability, and thus allows for the development of innovative business models (Liao & Caramichael, 2022).

Stablecoins can provide an alternative to certain functions of the banking system and offer access to transactions and a store of value for people that either do not have access to the banking system or do not want to participate in it. Stablecoins can also provide a means of exchange that is decentralized and open for peer-to-peer transactions without relying on several layers of intermediaries. The potential to support greater financial inclusion is especially relevant in emerging and developing economies with high numbers of unbanked citizens and a less developed banking system.

In contrast to 'classical' cryptocurrencies where speculation is at least one component related to its use and success, stablecoins are mainly used as a medium of exchange and a store of value. When looking at the data, we see that USDT is not only the most frequently used stablecoin, but also the cryptocurrency with the largest trading volume. In comparison, USDT's main rivals, USDC and BUSD are catching up in terms of market capitalization however the same cannot be said about their trading volume. We therefore conclude that the latter are primarily used as a store of value. In both cases, as a store of value and a medium of exchange, stablecoins provide a crucial addition to cryptomarkets. Stablecoins can be used as a vehicle currency for the trade between cryptocurrencies, a safe haven in times of turmoil in the market, and as a sophisticated means of payment.

Depending on their structure, reserves, governance and the regulatory requirements applicable to them, stablecoins can exhibit varying degrees of similarity to CBDCs, with the fundamental difference being that stablecoins are privately issued digital currencies that cannot provide the same level of security as central bank issued digital currencies. On the

other hand, stablecoins can be designed and implemented in a more sophisticated way that goes beyond simply mirroring existing fiat currencies (e.g. incorporation of programmability as a feature). There is potential, therefore, for stablecoins to provide features and advantages that CBDCs may not be able to provide.

## 2. Design choices and features for stablecoins

#### 2.1 Drivers of design choices and features

Stablecoins have the potential to revolutionize the international payment system, to bank the unbanked or underbanked and to create new business opportunities. While most stablecoins are mainly used at crypto exchanges, the possibility of micropayments, significant reduction of transaction fees, 24/7 availability, and ease of use in international transactions imply that stablecoins are here to stay. In the following section we will explore in more detail some of the stablecoin use cases briefly touched on in Section 1.5, that drive their design choices.

#### 2.1.1 Retail payments

Why should there be a need for a stablecoin for retail payments when there are already dozens of electronic payments alternatives? This is an often heard objection when it comes to payment oriented stablecoins. As alluded to in Chapter 1, there are striking differences between current payment methods like PayPal, Apple Pay, credit cards and girocards (called "e-payment" for simplicity) and stablecoins. While people in developed countries might not perceive some of these differences as relevant, for many in less-developed countries, they certainly are.

The most important difference between stablecoins and electronic payment alternatives is that the e-payment methods rely on the banking sector while stablecoins do not need to. This leads to differences in availability and costs of payments.

Apple Pay, Amazon Pay etc. are connected either to a bank account or to a credit card which in turn is connected to a bank account. Stablecoins, by contrast, can process their payments through their own blockchain (this is the case for BUSD and was the plan for the abolished project of Diem) or through one of the existing blockchains. This means that, in a technical sense, it is rather easy to develop a retail payment system without having to rely on banks. From an individual standpoint, a mobile phone and internet connectivity is sufficient to participate in the payment system. Additionally, a regulator may require that customers undergo a know-your-customer (KYC) procedure.

Overall, this means that the costs for payments could potentially become very small, especially when the stablecoins operate with an energy efficient blockchain. Again, while feeless domestic wire transactions are already a reality in many developed countries like Germany, this is not necessarily the case in developing countries and even in the United States of America (USA) where the charges for domestic wire transfers are surprisingly high (Wells Fargo, 2022). When considering the bottlenecks of access and costs together, stablecoins could improve conditions for financial inclusion.

Apart from this, stablecoins have the potential of being used in combination with other blockchain technology features like smart contracts, meaning that you could have both programmable payments, and programmable money. Smart contracts are lines of code that transfer crypto-assets from one address to another based on a predefined condition (trigger). According to Bundesbank programmable payments are defined as transfers of money for which the time, payment, amount, and/or type of transfer are determined by conditions specified in advance (Gross, 2020, as cited in Bundesbank, 2020). In its simplest form, this is already available for deposit money. By contrast, programmable money is defined as a digital form of money which the user can program to follow an inherent logic for a predefined purpose, based on the attributes of the digital money itself. For this, you need a DLT-based money.

#### 2.1.2 Online payments

Stablecoins offer opportunities for specific use cases, especially in online payments where their purpose as means of payment could be harnessed with peer-to-peer, micro-payments and potential machine-to-machine (M2M) payments, thereby offering a wide range of potential future applications. A unique selling point for stablecoins in online payments relates to their new form of online exchange and its underlying DLT technology which enables 24/7 availability, borderless payments, fractionalisation (the ability to pay in miniscule units) and seamless integration with non-financial services and next-generation innovations (e.g. Web3, Industry 4.0). In the future, it is possible that private stablecoins could challenge existing digital means of payments for online payments (e.g. e-commerce). A prime example was the Meta-initiated digital currency, Diem, which involved the creation of a private stablecoin backed by a group of corporations and aimed at retail payments. Stablecoins are often believed to fill a bridging function between DLT and fiat currencies, hence their robust and decentralized method of exchanging value could be expected to gain market share in e-commerce. Stablecoins have faster settlement times and cheaper international transactions are likely to translate into wider adoption should merchants become more willing to accept new means of payment and regulation providing an opportune and more transparent framework. A sound and well-considered regulatory framework is likely to boost adoption of stablecoins and therefore of blockchain technology above and beyond its current niche uses.

#### 2.1.2 Machine-to-machine payments

In the future Industry 4.0, M2M payments would require new innovative payment solutions. Machines equipped with sensors can be enabled through algorithms (smart contracts) to trigger orders of material and intermediate products and release payment for goods received with minimal human intervention. Connected devices will do business with one another as autonomous legal agents. This may include, for example, payments by Internet of Things (IoT) devices in Industry 4.0 (e.g. automatic recharging of cars, automatic order of supply for manufacturing, toll payments, logistical services, deliveries).

Programmable payments take advantage of the described stablecoins' advantages to fulfill orders. These additional capabilities are underpinned by smart contracts. They allow for automatic execution of both commercial and financial transactions in accordance with a predefined set of hard-coded rules. This holds the promise of substantial efficiency gains by avoiding the need for either manual processing or third-party intervention altogether.

Allowing for direct M2M transactions is important for the general efficiency of the digital economy and the roll-out of IoT infrastructure. This will reduce the need for a trusted third party, reduce settlement delays and reduce settlement costs.

#### 2.1.3 Pay-per-use

Due to the programming capability of stablecoins, they can also be used for conditional contracts in monetary transactions. New business models, such as usage-based billing for machine data, "pay-per-use", could thus be automated, saving processing costs. Currently, such processes can be mapped in a roundabout way using a trigger solution. However, a trigger solution cannot implement an optimal Delivery versus payment (DvP) for the execution of payment-on-delivery transactions. Atomic transaction settlements, for example, pose major challenges. Pay-per-use can be used to develop additional business models. One example is Asset-as-a-service (AaaS), a further development of today's "operating leasing". Here, the customer pays primarily according to the use of a machine and not according to its ownership. This is possible through sensor technology built into the machines. The IoT data is sent to a smart contract in a DLT network. This smart contract is dependent on contract terms where the usage of the asset triggers a payment from the user to the owner. Additional use cases such as predictive maintenance financing or integrated insurance for the machine owner in case of operational failure are therefore made possible due to smart contracts.

#### 2.1.4 Cross-border payments

The current international payment system is complicated, expensive and lengthy. According to the World Bank (2021), fees for international retail payments average six percent. Most of these payments are processed on the basis of the Society for Worldwide Interbank Financial Telecommunication (SWIFT) system and a network of around 9.000 correspondent banks. Differences in time zones, working hours, and bank holidays mean that payments take two to three working days to process. Since stablecoins are underpinned by blockchain technology which is not jurisdiction-bound, their operation for payments would be 24/7. The prerequisite for this to work would be a stablecoin issuer, which offers regulated wallets. Thus, clients would have to register with the correspondent financial supervisory authority, while regulator-approved smart contracts would accept or reject payments after checking for KYC issues. This requires a certain international coordination between financial supervisors. Such a development would especially benefit those who regularly send remittances, benefiting from cheaper and faster transactions.

#### 2.2 Business models

#### 2.2.1 Value proposition

As with most innovations, stablecoins can either become a source of cost savings or (part of a) service which generates revenue. The significance here lies in the fact that stablecoins are often built on common infrastructures such as blockchains, which lowers the technical entry barrier for their implementation. It can hence be expected that not just financial service providers will consider business models on the basis of stablecoins, but also technology providers or even providers of any platform that requires a payment mechanism.

Drivers for design choices and features of stablecoins will differ widely by the entity trying to include them in their business models. For instance, banks or other payment service providers will most likely select a design which leverages their current systems, interfaces, and processes. Platforms which involve payments may design the coins in a way that they fit well into their ecosystem and become a cheaper means of payment than the integration of other electronic payment systems.

In any case, due to their efficiency, programmability, and flexibility, stablecoins will most likely reduce costs associated with transactions. Revenue generation streams that are made possible from the issuance of stablecoins include transaction or exchange fees (to other means of payment or currencies) and interest derived from underlying assets held as reserve (eg. fiat in a bank account or invested elsewhere).

#### 2.2.2 Risks

Significant financial loss may occur if an individual purchases a stablecoin purportedly collateralized by fiat currency while the stablecoin issuer does not keep their promise to hold enough collateral against the issued stablecoins. As a result the individual might not find a counterparty to reverse the trade at the same price, but only to a much lower price or not at all. Macroeconomic destabilization would happen if the stablecoin in question is very popular and a run on this stablecoin happens due to suspicion of fraud or another kind of shock. The repercussions for the economy could be similar to a bank run. The rating agency, Fitch, warned in July 2021 of problems with the stablecoin USDT: "A sudden mass redemption of USDT could affect the stability of short-term credit markets if it occurred during a period of wider selling pressure in the CP [Commercial Paper]" (Fitch Ratings, 2021).

A significant use of stablecoins could lead to the diminishing importance of central bank money (i.e., cash) and commercial banks, reducing the efficacy of monetary policy transmission. Additionally, a large-scale conversion of commercial bank deposits into stablecoins could destabilize the financial sector.

Stablecoins used in the payment service could cut into the profits from the payment business of banks. This could lead to further disruption in one of the bank's business segments which has been already under attack by other payment services.

The most effective way to mitigate the aforementioned risks would be to provide transparency about the underlying assets.

The stablecoin issuer could provide credible evidence that the stablecoin collateral is liquid and covers 100% of the outstanding stablecoins. This could be done by an auditor assessing the correctness of the statement of the issuer's reserve account report monthly. The credibility of this statement would increase if the financial supervision would have to accept the audit. This is not the case, for example at Coinbase, where Center is managing the reserve, which is then attested (not fully audited) by auditor Grant Thornton (Center, 2022). In addition, a transparent, audited outline of the assets which serve as collateral for the outstanding stablecoins would lead to more credibility.

A further mitigation of risks could mean that stablecoin issuers would have to be regulated similar to banks, but with some special requirements. This could for example mean that the

stablecoins would have to be covered by 100% of highly liquid assets of the domestic currency. This would not only minimize the risk of fraud and macroeconomic destabilization, but also avoid that stablecoin issuers would create additional money.

#### 2.2.3 Privacy

According to a 2021 European Central Bank (ECB) survey privacy was a top-two feature of a prospective digital euro for 58% of respondents (ECB, 2021). However, a more recent 2022 publication by the ECB on privacy options claims that "User anonymity is not a desirable feature", and that "The Eurosystem should only be able to see the minimum transaction data required to validate digital euro payments" (ECB, 2022).

To garner greater stablecoin use in the future, privacy-preserving stablecoins might be beneficial. These stablecoins would enable privacy that is controlled by users, with no back doors, and not being dependent on a central bank promise to keep data private, like several CBDC options suggest. However, as much as stablecoins should provide as much as possible physical cash-like privacy and anonymity, they should address tax and regulatory issues and constraints, including anti-money laundering (AML) and combating the financing of terrorism (CFT) without disclosing any transaction details to third parties, including the government, unless there is a court order.

There are several serious propositions for enabling privacy by design, while fighting illicit activities. It is on regulators to enable stablecoins that fulfill traders' desire for bilateral privacy payment, cash-like, while they will render a claim check unredeemable per a competent court order.

## 3. Interactions between stablecoins and CBDCs

A digital euro in the form of a CBDC and existing stablecoins are likely to coexist in the coming years in Europe as private and public actors are developing new forms of money and payments. They present important differences on their issuance, technology and regulatory regime. In some dimensions there might be a competition in different usages and adoption areas. But there are situations in which both types of money will necessarily have to interact, which is a technical, legal, economic and institutional question. More importantly, this coexistence could be anticipated to facilitate their respective positioning and to design advanced interactions. At the core of the synergies described above is the question of interoperability that depends on design choices around a digital euro.

- A first level of interoperability is the use of a digital euro or central bank money in general as a backing for stablecoins. This could focus the role of the central bank and the digital euro as a trust and financial stability provider, while leaving open private payment competition.
- A second level of interoperability is to facilitate the direct exchange between euro stablecoins and a digital euro. The digital euro would have diverse roles and keep a stabilizing effect on stablecoins.

 A third level consists in interoperability in the payment ecosystem. Common regulatory regimes and similar programmatic interfaces would allow service providers to interact with both seamlessly. This would enhance the network effect of both and their adoptions. For financial markets, including open blockchain DeFi, the adoption of similar standards would allow the use of the different forms of money, increasing resilience.

#### 3.1 Encouraging the use of a digital euro as reserve for stablecoins

Perhaps one of the more interesting opportunities for the public and private sectors to interact with and build a potential partnership between CBDCs and stablecoins can be found in the development of a "synthetic CBDC". The idea was first introduced by the International Monetary Fund (IMF, 2019) and effectively seeks to maintain the current advantages of the dual monetary system; namely where the public sector offers financial stability and the private sector provides innovation.

Broadly speaking, a synthetic CBDC could be technically achieved by allowing a private sector stablecoin provider to back-up its digital currency with a central bank liability. It should be noted that the Bank for International Settlements argued that such a framework is not, strictly speaking, a CBDC since it is neither issued by, nor the direct liability of, a central bank (Bank for International Settlements, 2020). Nonetheless, such a liability could be issued by granting a stablecoin provider access to a central bank reserve account, while others favor a blockchain-based liability (e.g. wholesale CBDC) approach (Copic, 2021).

In either case, from an economic perspective, using a central bank liability as collateral for a privately-issued stablecoin is conceptually similar to backing the issuance of commercial bank money with central bank reserves. Allowing the private sector to focus on technological innovations, customer service, distribution, and due diligence (among other things), while the central bank essentially provides a trusted reserve asset that serves as collateral, the IMF argues that a synthetic CBDC is thus a "far cheaper and less risky model of CBDC for central banks, relative to the full-fledged model" (Adrian, 2019, p.15).

Nonetheless, there are legal issues that would need to be considered. Granting a private sector stablecoin provider access to a reserve account would likely require legislative changes, as such accounts are typically only issued to bank holding companies. The e-money directive (European Parliament and of the Council, 2009) and the upcoming MiCA regulation (European Parliament and of the Council, 2019) could serve as an opportunity to open this access to private sector actors. Additionally, while access to a reserve account may give the stablecoin provider a legal claim on the central bank, it is uncertain how this claim would pass through to the end-user should the stablecoin provider go bankrupt.

However, it is possible that such issues may be resolved if a blockchain-based central bank liability (such as wholesale CBDC) is used, instead of a traditional reserve account. Specifically, the programmable nature of a blockchain-based liability could allow for a stipulation in the smart contract, such that if a stablecoin provider goes bankrupt, the legal claim on the liability is transferred from the provider to the end-user (or holder) of the stablecoin.

#### 3.2 Ensuring exchangeability

Stablecoins generate a digital claim check for money (or any transactable valuable) held ready for instant redemption. Any bank, or any public or private entity commanding public trust, can declare itself a mint of stablecoins, submit itself to the issued regulatory guidelines, and compete for public attention. Stablecoins can establish a payment regime in a small or large community, offering users a digital claim check of their local currency, that is simpler than CBDC, secure, private phone-to-phone, local or remote. Stablecoins should be redemption-ready making them a de-facto transactable currency.

This dynamic could be leveraged by providing a common framework for various stablecoins. Each mint will be free to put out its own protocol, fees, wallet, service, and security. The key regulatory requirements will be: (i) payer-to-payee payment privacy shall be upheld; and (ii) the various stablecoin mints will honor each other's products. The trading public will have a large selection of coins to choose from and a large selection of mints to do business with. Thereby competition and choice are brought into the currency business, replacing the "one-size-fits-all" model prevailing today, lingering from the pre-digital era. Only a few entities that command sufficient public trust will flourish and sustain a society of traders, while staying in constant competition. If one mint fails in quality of service or reliability, then traders will shift to the next mint. To facilitate this common framework, an exchange solution is required, where coins from one mint are readily convertible to coins from any other mint in the network, all priced via a dominant pricing currency, euros in the Eurozone.

Such an ecosystem could be expanded to the digital euro, either by having it directly issued on the same platforms or by facilitating exchange between digital euro units and those stablecoins by private actors. This exchange would facilitate the usage of both forms of money. The service would likely be offered by private actors, offering de facto interoperability at the technical and legal level. Those actors would likely be strongly regulated, as Crypto Assets Service Providers (CASPs) and as financial institutions. They may be the stablecoins issuers themselves, especially if they are reserve-backed stablecoins.

#### 3.3 Establishing a common payment regime

Some of the major use cases for stablecoins are peer-to-peer payments, faster and cheaper cross border transactions and DeFi services, and collateral for decentralized loans. However, due to the weak legislation that affects most of the privately issued stablecoins, their use cases cannot yet be fully transferred to the banking industry or a large part of institutions. This is a similar phenomenon observed with the real uses of CBDCs, since they are generally projects under development, their uses are quite limited. As such, one has to consider the potential that these instruments possess. CBDCs that use blockchain technology could optimize the tokenization of assets, with a positive impact on liquidity, from real assets to parts of the balance sheet that are not liquid today (e.g. certain types of debt). The programmability that blockchain technology allows lets us imagine scenarios in which even monetary policies are programmed into CBDCs, in a way similar to the architecture of algorithmic stablecoins.

While the majority of current stablecoins – not only in the cryptocurrency ecosystem (USDT or USDC) but also those issued by financial institutions (USC Coin) – leverage blockchain technology, many CBDCs do not. If we consider the uses of a CBDC not deployed on a

blockchain network, they will be quite similar to those of digital money (95% of money in circulation is in this format) used today. This is the case of the most developed CBDC project to date – the digital yuan – as well as a hypothetical digital euro that would almost certainly not employ the use of blockchain technology. It is the blockchain that allows us to imagine certain use cases that were previously unimaginable for a currency a few years ago. Its programmability and cost-savings allow a range of uses that will not be available to currencies that do not use the technology.

The biggest distinction between CBDCs deployed on blockchain and those that are not is their traceability. While transfers from the former can be easily publicly audited – just like private stablecoins – this is not the case with the latter. The biggest difference is that central banks are behind the issuance of CBDCs, backed by their assets, while stablecoins are issued by private entities. This is one of the biggest problems with many stablecoins, i.e. what actually backs these coins and allows them to be pegged 1:1 to fiat currency. The case of USDT, where it was shown that its reserves did not back 100% of the coins issued, is a materialization of this fear. It remains to be proven whether there would be differences in, for example, the speed of transfers or settlement between CBDCs that do not use a blockchain network and those that do.

Another important difference is which instrument will be used to store a CBDC or a stablecoin from a retail point of view. Stablecoins can currently only be stored in wallets of external providers (e.g., Metamask or Ledger), but not in a current account. This hinders the real uses of stablecoins in the banking sector. Conversely, a CBDC would enjoy this recognition and could be incorporated into a bank account without any problem, allowing its use in many more cases. As for payments, payment with stablecoins at retailers is at present, very difficult. Most bank card providers that allow the use of crypto, such as Visa or Mastercard, simply do a conversion from stablecoin to fiat for a fee but do not allow real payment with stablecoins. There are very few retailers in Europe that allow direct payment with stablecoins and only allow such payments through third parties and applications. Therefore, their integration into the current payment system is still very poor. A CBDC would not face these roadblocks.

Therefore, facilitating interoperability by allowing stablecoin use in similar cases would facilitate cooperation and increase the resilience of the payment ecosystem. Alternatively, intermediaries might provide this unifying service.

## 4. Outlining a legal framework for stablecoins

#### 4.1 The current legal framework

The current legal framework for euro stablecoins is defined by:

- The Proposal for a Regulation of the European Parliament and of the Council on MiCA, as published in November 2021 and as adopted by the European Parliament's Economic and Monetary Affairs Committee (with amendments) on 14 March 2022. MiCA facilitates the following:
  - provides comprehensive regulation of crypto-assets, using tried-and-tested regulation instruments from the regulation of financial instruments;
  - obligations for issuers, offerers, depositors;
  - $\circ~$  sets up typologies of crypto assets, including asset-referenced tokens and therefore also stablecoins and
  - distinguishes two types of stablecoins:
    - "Asset-referenced tokens" (ARTs). These are stablecoins tracking virtually any asset except for the euro or another EU country currency. This includes dollar-denominated stablecoins, but also stablecoins tracking a basket of currencies or gold, for example.
    - "E-money tokens" (EMTs), stablecoins denominated in euros or another EU country currency. Because they have a very high potential to function as a means of payment, requirements are strict.
- Directive 2014/65/EU, Markets in Financial Instruments Directive 2, commonly known as "MiFID 2": grants investor protections for holders of security tokens which are not within the scope of the MiCA. In this respect, various other regulations apply, e.g. Prospectus Regulation (publication obligations for public offers or for admissions to trading on a trading platform) and the Market Abuse Regulation (rules on the prevention of market abuse).
- Fifth EU Anti-money laundering directive (AMLD5), which came into effect in January 2020.

It is expected that as the new EU regime comes into effect, the cancellation of national concurrent regulations on crypto assets will result, to simplify the legal framework, enable travel rules (European Parliament, 2022) and avoid intra-EU regulatory arbitrage.

#### 4.2 Need for convergence of rules between public and private digital euro

It is desirable that the same regulations have specific and similar provisions also for euro CBDC transactions, to ensure a level playing field, and avoid regulatory arbitrage between euro stablecoins and the euro CBDC. In spite of educational activities and different naming, users of crypto currencies will clearly compare public and private digital euros for similar use

cases. To ensure that a fair competition is in place, similar rules for providers and protection of users have to be in place.

#### 4.3 Need for an internationally coordinated approach

Governance bodies (governments and central banks, other financial regulators etc.) are limited to the specific territory of their jurisdiction however, the digital space is global. Therefore, a globally coordinated approach to the regulation of stablecoins is required (Arner D. et al, 2020). Currently, there is no harmonized global regulation of stablecoins and, as a result, it is unclear whether stablecoins are considered a money equivalent, categorized as contractual claims or property rights, or entail a right against an issuer or underlying assets. Depending on their design and claim structure, stablecoin arrangements might have features of payment systems, bank deposits, foreign currency exchanges, commodities or investment securities. Ambiguous rights and obligations could result in the loss of confidence in stablecoins, with implications for their adoption and financial stability. It is to be observed, incidentally, that cross-border payments in fiat currencies and related foreign exchange (FX) conversions are not covered by any global regulation.

We therefore agree with the FSB principles highlighting:

- 1. the need for the supervisory authority to have appropriate powers, tools and resources;
- 2. that regulatory requirements should be applied on a functional and proportional basis;
- 3. that there is comprehensive regulation, supervision and oversight on a cross border basis and that these are met by a global stablecoin (GSC) arrangement before commencing operations;
- 4. that GSC arrangements have in place a comprehensive governance, risk management and fit and proper framework, robust data systems, appropriate resolution and recovery plans; and
- 5. that GSC arrangements provide sufficient data and legal clarity for users, particularly around redemption and insolvency.

Moreover, the tax treatment of transactions using stablecoins is unclear in some jurisdictions, and the absence of harmonized comprehensive guidance at international level complicates matters further.

A major principle regarding international regulation of global stablecoins should be that regulatory arbitrage should be avoided, covering also cross-border transactions and transactions in global private stablecoins.

The goal should be to ensure that innovation in digital currencies promotes fair trade and global growth rather than regulatory arbitrage, illegal transactions, and currency sovereignty shifts.

#### 4.4 Recommended further regulatory activities

Further regulatory attention should be dedicated towards:

- The extension of the protection of non-professional investors to investments in crypto assets, including those issued outside of the European Economic Area (EEA) but offered in the EEA. The goal is to ensure the same protection and the same requirements of risk awareness and education that apply today in the EU to traditional investments in equities and derivatives, including deposit guarantee schemes.
- 2. The scope extension of current EU rules affecting payment services (e.g. PSD2) to payments in crypto assets too. The goal is to ensure transparent payment fees and delays, and ensure KYC of users and transparency of information of the ordering party, beneficiary and respective providers, for payments where an EU user or provider is involved. The same transparency is required for M2M payments, where legal persons or natural persons need to be identified as the ordering party and beneficiary.
- 3. The amendment of the specific EU Cross Border Payment Regulation (Regulation 2019/518) for FX transparency to conversions involving crypto assets, including conversions, from and to, fiat currencies. The goal is to ensure that the ordering party is informed of the conversion rate and conversion fee before their confirmation of the execution, and that no conversion fee is applied to the beneficiary without their consent.

Nonetheless, interoperability of different private and public digital currencies, both as assets and as vehicles for payments, require efficient and transparent conversion exchanges that need to be globally regulated to ensure free availability of rate quotes and fair, unmanipulated pricing.

#### 4.5 Public education programs

The EU should promote public education programs in all member states, addressed to citizens with and without a financial education background, and to SMEs, perhaps within the existing digital finance literacy programs such as the those going on in Uruguay that specifically indicate that the Ministry of Education will have to develop programs for all the citizens including knowledge of virtual assets (Sartori, 2021). Education programs should contain content such as:

- 1. What is a stablecoin?
- 2. What are the main use cases (intentional payments, programmed payments, investments, loans, online purchases, etc.) and the peculiarities of stablecoins?
- 3. How to convert physical euros into euro stablecoins and back into euros?
- 4. What are the practical differences between a stablecoin, a euro CBDC, a physical euro, a euro as bank deposit, a non-euro private digital currency like USDT, or an e-money crypto asset like Bitcoin, all within the EU jurisdiction?

- 5. What are the rights and the duties of the users and the providers within the EU, for digital currency investments, lending, payments, and other transactions, and for conversions into stablecoins?
- 6. What are practices to minimize the risk of losses from scams and fraud?

#### 4.6 Fair marketing communication by authorized providers

Industry associations should promote transparent communication, ensuring that all providers involved in the offering of the digital euro to EU citizens and EU business entities openly show:

- all the costs involved,
- all the risks involved,
- and all the user rights according to EU regulation

## 5. Recommendations

(1) Clearly define and categorize stablecoins towards developing a regulatory regime that fosters greater development and innovation in the stablecoin market such that new business models and use cases (M2M, paper-per-use etc.) are encouraged, and risks for end users are mitigated.

(2) Encourage the use of the potential digital euro as a reserve for stablecoins to facilitate ease of exchange between digital euro units and stablecoins by private actors.

(3) Ensure exchangeability by providing a common framework for various stablecoins.

(4) Establish a common payment regime for CBDCs and stablecoins to facilitate cooperation and increase the resilience of the payment ecosystem.

(5) Define a legal framework and regulations for investments, lending, payments, and other transactions denominated in euro stablecoins.

(6) Undertake an internationally coordinated approach to stablecoin regulation to prevent ambiguity of classification and create confidence in stablecoin use.

(7) Develop public education programs to educate the public on stablecoin benefits, uses and risks towards greater adoption.

(8) Ensure transparent marketing communication by authorized providers in terms of costs, risks and user protection regulation.

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