

ECB Internal Crypto-Assets Task Force (ICA-TF)

Research Report

Stablecoins: Implications for monetary policy, financial stability, market infrastructure and payments, and banking supervision in the euro area

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ECB Crypto-Assets Task Force

Stablecoins:

Implications for monetary policy,
financial stability, market
infrastructure and payments, and
banking supervision in the euro area

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Contents

Abstract	2
Executive summary	3
1 Introduction	5
2 Characterisation of stablecoins	7
3 Recent developments and current status of stablecoins	11
4 Risk assessment	17
4.1 Monetary policy	19
4.2 Financial stability	22
4.3 Market infrastructures and payments	23
4.4 Banking supervision and prudential regulation	27
5 Conclusions	31
References	33
Acknowledgements	35

Abstract

This paper summarises the outcome of an analysis of stablecoins undertaken by the ECB Crypto-Assets Task Force. At the time of writing, the stablecoin debate lacks a common taxonomy and unambiguous terminology. This paper applies a definition that distinguishes stablecoins from existing forms of currencies – regardless of the technology used – and characterises stablecoin arrangements based on the functions they fulfil. This approach emphasises the role of technology-neutral regulation in preventing arbitrage, as well as comprehensive Eurosystem oversight, irrespective of stablecoins' regulatory status. Against this background, this paper assesses stablecoins' implications for the euro area based on three scenarios for the uptake of stablecoins: (i) as a crypto-assets accessory function; (ii) as a new payment method; and (iii) as an alternative store of value. While the first scenario is merely the continuation of the current state of the market and, thus far, has not posed concerns for the financial sector and/or central bank tasks, stablecoins of the type envisaged in the second scenario may reach a scale such that financial stability risks can become material, and the safety and efficiency of the payment system may be affected. The third scenario is both the least plausible and the most relevant from a monetary policy perspective. The paper concludes that the Eurosystem relies on appropriate regulation, oversight, and supervision to manage the implications of stablecoins (and the risks that stem from them) on its mandate and tasks under plausible scenarios. The Eurosystem continues monitoring the evolution of the stablecoin market and stands ready to respond to rapid changes in all possible scenarios.

Keywords: stablecoins, implications of stablecoins, regulation, oversight

JEL codes: E42, G21, G23, O33

Executive summary

“Stablecoins” are a relatively recent payment innovation, which has already been the subject of much debate – particularly in the last year. Initially, terminology can be a confusing, even misleading, element in the discussion surrounding new technological phenomena. This report builds on an earlier definition of stablecoins as digital units of value that differ from existing forms of currencies (e.g. deposits, e-money, etc.) and rely on a set of stabilisation tools to minimise fluctuations in their price against a currency, or basket thereof.¹ Different types of stablecoins have emerged.² To maintain a stable price, some stablecoin initiatives pledge to hold funds and/or other assets (“collateral”) against which stablecoin holdings may be redeemed or exchanged. Stablecoin arrangements fulfil multiple functions: from the stabilisation of the value of stablecoins to the transfer of value, and interaction with users.

Recent initiatives may stimulate the adoption of stablecoins and raise implications for public policy, regulation, oversight and supervision. The extent of these implications will depend on the specific scenario for the uptake of stablecoins. This article identifies three such scenarios. Stablecoins could have a “crypto-assets accessory function” that allow securing crypto-asset revenues in less volatile assets without leaving the crypto-ecosystem (first scenario), or become a “new payment method” (second scenario), or even an “alternative store of value” (third scenario). These scenarios depend on the specific features of stablecoins – the second and third scenarios are reliant on stablecoin types that offer high levels of price stability and credible redemption policies – and on key drivers for their adoption (e.g. convenience and ease of use as compared to existing instruments).

This analysis shows that a stablecoin arrangement of the type entailed in the second scenario (“new payment method”) could reach a scale of operations such that fragilities within the stablecoin arrangement itself, and its links to the financial system, may give rise to financial stability risks. Stablecoins are vulnerable to liquidity “runs”. Where a stablecoin is exchanged/redeemed at the market value of its collateral, a run could occur if end users are confronted with the prospect that the stablecoin’s collateral may lose its value. Runs could also occur in the case of an arrangement that guarantees redeemability at face value – if the stablecoin sponsor is perceived as lacking sufficient loss-absorbing capacity. In these events, the liquidation of assets to cover redemptions could have negative contagion effects on the financial system.

As part of their transfer of value function, stablecoins can also have implications for the safety and efficiency of payment systems and, under certain conditions, even pose systemic risk. The specific sources of risks and inefficiencies would depend on the design of the transfer of value system, ranging from the legal basis to governance (especially in a highly decentralised arrangement), the

¹ See Bullmann et al. (2019).

² See European Central Bank (2019).

arrangement's choice of settlement asset, operational complexities and, among other things, cyber risks.

Euro deposits and cash are expected to be resilient to the possible advent of an “alternative store of value”. In the event that this less plausible “alternative store of value” scenario materialises, significant implications for monetary policy could arise. This scenario involves stablecoin types that hold safe assets as collateral to achieve high levels of stability of the stablecoin's value. Their significant uptake could increase demand for safe assets by stablecoin arrangements and might have a negative impact on price formation, collateral valuation, money market functioning and the monetary policy space. Banks' intermediation capacity might also be challenged. That being said, the current negative interest rate environment could place significant constraints on the profitability of a non-interest-bearing stablecoin, as its collateral would be remunerated negatively.

The Eurosystem can use a range of tools to manage the implications of stablecoins in plausible scenarios. The Eurosystem's oversight framework will cover stablecoin arrangements that qualify as payment systems regardless of the technology used and their organisational setup. Furthermore, the Eurosystem is reviewing its oversight framework for payment instruments and schemes, with a view to broadening its scope to include any electronic payment instruments that enable end users to send and receive value, including based on stablecoins. The Single Supervisory Mechanism (SSM) can rely on the existing approach for supervision and require banks to put in place an appropriate risk management framework for addressing risks resulting from their potential involvement in stablecoin arrangements/ecosystems.

These efforts need to be complemented by adequate, internationally coordinated regulation and cooperative oversight and supervision. The European Union (EU) and Eurosystem regulatory and oversight response should follow the principle of “same business, same risks, same rules” to ensure a level playing field by applying existing requirements as appropriate and closing gaps (e.g. through suitable prudential requirements for large stablecoin issuers) in a manner consistent with the guidance of international standard setting bodies. Appropriate accounting and prudential treatments should be identified in a timely fashion. Overseers and supervisors should strengthen cooperation arrangements in the light of ecosystems spanning multiple jurisdictions.

The Eurosystem continues to monitor the evolution of the stablecoins market and stands ready to respond to rapid changes in all possible scenarios. Current initiatives could alter the European payments landscape and may exacerbate Europe's dependence on global players in the field of payments. This may call for, inter alia, fostering central bank innovations to cater for a changed environment in the payments space and altered conditions for the exercise of a central bank's core mandate.

1 Introduction

The ECB Internal Crypto-Assets Task Force (ICA-TF) was established in 2018 with a mandate to deepen the analysis around virtual currencies and crypto-assets. The ICA-TF analysis focuses on assessing and identifying how to contain any adverse impacts of crypto-assets on the use of the euro, the Eurosystem's monetary policy, the safety and efficiency of financial market infrastructures and payments, and the stability of the financial system. This analysis serves as a basis for European Central Bank (ECB) contributions to policy discussions in the European System of Central Banks (ESCB), the EU and other international fora, and with the relevant regulatory authorities. The Occasional Paper³ published in May 2019 summarises the ICA-TF analysis on crypto-assets. Since then, the ICA-TF has been monitoring market developments with a view to keeping this assessment up to date.

While stablecoins are not a new development – the currently most traded stablecoin dates back to 2014 – recent initiatives have brought about a paradigm shift in the public debate on stablecoins. In particular, the announcement of one such initiative – Libra – in June 2019 triggered a globally-coordinated response under the umbrella of the G7. The G7 working group report on the impact of global stablecoins was published in October 2019.⁴ From then on, the G20, the Financial Stability Board (FSB), and several standard setting bodies have also embarked on efforts to address the potential risks while harnessing the potential of technological innovation.⁵ The ECB participates in these efforts via the relevant fora. In December 2019 the Council and the European Commission released a joint statement on stablecoins, calling for a coordinated approach to tackling the challenges raised by global stablecoins, and swift action on the part of the relevant authorities in cooperation with the ECB.⁶

Building on ongoing work at the international level and leveraging its crypto-asset analytical framework, the ICA-TF has analysed stablecoins with a view to identifying their potential implications for the Eurosystem's monetary policy, as well as euro area financial stability, market infrastructure and payments, and banking supervision. This analysis is not intended as an evaluation of the merits of stablecoins versus their drawbacks, but rather serves as a contribution to the development of a safe environment for innovations in payments and financial services.

This paper is organised as follows. Section 2 provides a characterisation of stablecoins and stablecoin arrangements. Section 3 summarises recent developments and current status of stablecoin markets. Then, Section 4 provides an assessment of stablecoins' implications, covering monetary policy, financial stability,

³ See ECB Crypto-Assets Task Force (2019).

⁴ G7 Working Group on Stablecoins (2019).

⁵ See Financial Stability Board (2020).

⁶ See Council of the European Union (2019).

market infrastructure and payment dimensions, as well as the banking supervision and prudential regulation perspective. Section 5 concludes.

2 Characterisation of stablecoins

Stablecoins can be generally defined as digital units of value that are not a form of any specific currency, or basket thereof, and that rely on a set of stabilisation tools to minimise fluctuations of their price against such currency, or currencies.⁷

To maintain a stable price against the currency, or currencies, of reference, some stablecoins pledge to hold funds and/or other assets (“collateral”) against which stablecoin holdings can be redeemed. Alternatively, stablecoins rely on a mechanism that attempts to match demand and supply so as to maintain parity between the stablecoin and the reference currency, or currencies, and to guide users’ expectations on its future value (algorithmic stablecoins). An element common to all stablecoin initiatives is their reliance on an open market to reinstitute par value by providing arbitrage opportunities. Stablecoin arrangements fulfil multiple functions including the stabilisation of the value of stablecoins, the transfer of stablecoins and the facilitation of the interaction with the users via a dedicated interface.⁸

Existing forms of currencies and other traditional assets that use innovative technologies are not the focus of this analysis. Examples include e-money and commercial bank deposits recorded by means of distributed ledger technology (DLT), which nevertheless may be marketed as stablecoins. Wholesale digital tokens for the settlement of large-value transactions between institutions (usually banks), which represent an existing claim, either on a specific issuer or on underlying assets or funds, or some other right or interest⁹ – and often referred to as stablecoins – are not addressed in this paper. Central bank digital currencies (CBDCs) are also excluded from the scope of this analysis insofar as they are a liability of the central bank.

Based on their design, stablecoins have been classified into four types: (i) tokenised funds¹⁰; (ii) off-chain collateralised stablecoins; (iii) on-chain collateralised stablecoins; and (iv) algorithmic stablecoins.¹¹ Table 1 summarises the main characteristics of each stablecoin type. Stablecoins can also be distinguished on the basis of their geographic scope, whereby “global” stablecoins would encompass multiple jurisdictions in terms of their users, the entities comprising the arrangement, and the composition of the collateral (if relevant).

⁷ See Bullmann et al. (2019).

⁸ See G7 Working Group on Stablecoins (2019).

⁹ See CPMI, Wholesale digital tokens, December 2019.

¹⁰ The term “tokenised funds” is borrowed from Bullmann et al. (2019) and is used here without prejudice to the competent authorities’ determination of applicable law, i.e. whether or not the initiative can be qualified as funds in the meaning of the Revised Payment Services Directive (PSD2). In practice, as noted later in this paper, these initiatives share several features of supervised or overseen payment instruments, payment schemes and payment systems.

¹¹ Bullmann et al. (2019).

Table 1

Summary table of stablecoin characteristics

	issued on the receipt of:	"collateralised" by:	redeemable at:
Tokenised funds	funds (i.e. cash, deposits or electronic money)	funds and/or close substitutes (i.e. secure, low-risk, liquid assets ¹²)	market value of the collateral at the time of redemption or face value of the stablecoin
Off-chain collateralised stablecoin	assets held through an accountable entity (e.g. securities, commodities, or crypto-assets in custody with an intermediary)	assets held through an accountable entity (e.g. securities, commodities, or crypto-assets in custody with an intermediary)	market value of the collateral at the time of redemption
On-chain collateralised stablecoin	crypto-assets held directly on the distributed ledger	crypto-assets held directly on the distributed ledger	market value of the collateral at the time of redemption
Algorithmic stablecoins	crypto-assets or given away for free	no collateral – value of stablecoin is based purely on the expectation of its future market value	not redeemable

Source: Based on Bullmann et al. (2019).

Notes: Some stablecoin initiatives add to the pool of collateral own funds, which are raised through either fees or margin calls. Redemptions are subject to the conditions set out in the stablecoin's terms of service. For the purposes of this table, only voluntary redemption is considered. Compulsory redemption occurs when the value of the collateral for a stablecoin unit drops below the level specified within the rules of the stablecoin initiative.

Most stablecoins currently in operation (see also Section 3) do not share the most prominent characteristic of crypto-assets, which is the absence of a financial claim on, liability of, or proprietary right against any identifiable entity.¹³ In fact, tokenised funds and off-chain collateralised stablecoins necessitate an accountable issuer that is responsible for safekeeping of the collateral, either directly or through a custody agreement with a third-party, and can therefore be held to account for satisfying holders' rights.

Stablecoins that entail a claim/liability on an identifiable entity (which are not crypto-assets as per the ECB definition) should be subject to existing regulatory standards, as amended, to impose additional requirements where needed.¹⁴ Some initiatives in tokenised funds share the function and characteristics of e-money but the application of the Electronic Money Directive (EMD2)¹⁵ may be insufficient on its own to address increased complexities and risks of stablecoin business models. The application of EU investment fund regulation is also premised on the condition that the investment fund share represents a claim of its holder on the investment fund's assets¹⁶. Otherwise the issuer would not be bound by the standard EU regulatory framework of Undertakings for the Collective Investment in Transferable

¹² See, for example, Table 1 of Point 14 of Annex I to Directive 2006/49/EC of the European Parliament and of the Council of 14 June 2006 on the capital adequacy of investment firms and credit institutions (OJ L 177, 30.6.2006, p. 201).

¹³ See ECB Crypto-assets Task Force (2019).

¹⁴ See European System of Central Banks (2020).

¹⁵ Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 on the taking up, pursuit and prudential supervision of the business of electronic money institutions amending Directives 2005/60/EC and 2006/48/EC and repealing Directive 2000/46/EC (OJ L 267, 10.10.2009, p. 7). See Article 2.2 "electronic money" means electronically, including magnetically, stored monetary value as represented by a claim on the issuer which is issued on receipt of funds for the purpose of making payment transactions as defined in Point 5 of Article 4 of Directive 2007/64/EC, and which is accepted by a natural or legal person other than the electronic money issuer". See also EBA (2019a), which outlines the circumstance in which assets will qualify as electronic money and will therefore fall within the scope of the EMD2.

¹⁶ See Adachi et al. (2020).

Securities¹⁷ or Alternative Investment Fund Managers (AIFM)¹⁸, or by the regulation of Money Market Funds.¹⁹

Irrespective of the regulatory treatment of stablecoins, the function of stablecoin arrangements that caters for the execution of transfer orders may qualify as “payment system” for the purposes of Eurosystem oversight. The ECB Regulation on oversight requirements for systemically important payment systems²⁰ (SIPS Regulation) defines a payment system as “a formal arrangement between three or more participants, [...] with common rules and standardised arrangements for the execution of transfer orders between the participants”. Within this definition, transfer order and participants are defined in broad terms that allow accommodation of “any instruction which results in the assumption or discharge of a payment obligation” (Article 2(i) of the Settlement Finality Directive²¹) and any “entity that is identified or recognised by a payment system and, either directly or indirectly, is allowed to send transfer orders to that system and is capable of receiving transfer orders from it” (Article 2 (18) of SIPS Regulation), respectively. To the extent that stablecoin arrangements qualify as payment systems, the Eurosystem payment system oversight framework based on the Principles for Financial Market Infrastructures (PFMI) of the Committee on Payments and Market Infrastructures (CPMI) and the International Organisation of Securities Commissions (IOSCO)²² would apply.

Similarly, the function of stablecoin arrangements that sets standardised and common rules for the execution of payment transactions between end users could qualify as a “payment scheme”. Where stablecoins are denominated in, funded by or collateralised by euro, the governance body that is responsible for the overall functioning of the payment scheme might be subject to the revised and consolidated Eurosystem oversight framework for payment instruments and schemes. This framework, which is currently under development, would be applicable to any electronic payment instruments that enable end users to send and receive value, and hence would apply irrespective of the qualification of the asset as funds under the Revised Payment Services Directive (PSD2).²³

Furthermore, individual entities comprising a stablecoin arrangement’s ecosystem could take up activities to offer services or products that may well be subject to licensing regimes under EU or national law. Depending on the

¹⁷ Directive 2009/65/EC of the European Parliament and of the Council of 13 July 2009 on the coordination of laws, regulations and administrative provisions relating to undertakings for collective investment in transferable securities (UCITS) (OJ L 302, 17.11.2009, p. 32).

¹⁸ See Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers and amending Directives 2003/41/EC and 2009/65/EC and Regulations (EC) No 1060/2009 and (EU) No 1095/2010 (OJ L 174, 1.7.2011, p. 1).

¹⁹ See Regulation (EU) 2017/1131 of the European Parliament and of the Council of 14 June 2017 on money market funds (OJ L 169, 30.6.2017, p. 8).

²⁰ Regulation of the European Central Bank (EU) No 795/2014 of 3 July 2014 on oversight requirements for systemically important payment systems (ECB/2014/28) (OJ L 217, 23.07.2014, p. 16).

²¹ Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems, (OJ L 166, 11.6.1998, p. 45).

²² See Committee on Payments and Market Infrastructures and the International Organisation of Securities Commissions (2012).

²³ See footnote 9.

products they offer, and the services they provide, several legal and regulatory regimes could apply to them (including MiFID2²⁴, PSD2, AIFMD, etc.). The entire set of applicable frameworks could only be identified on a case-by-case basis.

Stablecoin arrangements should be subject to relevant regulation, oversight, and supervision across all relevant functions. Efforts are underway in the EU to examine the applicability of existing rules and evaluate the need for new legislation as appropriate. These efforts should prioritise substance over form and apply the same rules to all activities that give rise to the same risks, irrespective of the technologies used or the type of service provider/operator. Furthermore, regulation, oversight and supervision should cover all relevant functions comprising a stablecoin ecosystem, including those that are not governed by a stablecoin's issuer or scheme manager. Finally, given the cross-border nature of stablecoin arrangements, international coordination is crucial to ensure consistency and prevent regulatory arbitrage.

²⁴ Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU (OJ L 173, 12.6.2014, p. 349).

3 Recent developments and current status of stablecoins

A growing number of stablecoin initiatives have been reported in the last few years especially since 2018: of these, 50 are currently traded on crypto-asset trading platforms.^{25 26}

Most traded stablecoins were launched in 2018 (around 40%) while those that started to trade this year account for 16% of all traded stablecoins. Tokenised funds are estimated to be the most numerous stablecoin type, followed by on-chain collateral and algorithmic²⁷. Europe, including the United Kingdom and Switzerland, hosts a third of traded stablecoins, whereas a quarter have their headquarters in the euro area. Stablecoin market dynamism is also evidenced by a relatively high number of reportedly closed initiatives.²⁸

Stablecoins trade at levels comparable to those of bitcoin – the most prominent crypto-asset – with Tether, a stablecoin, in a dominant position (see Chart 1).

Trading volumes of stablecoins²⁹ showed dynamic increases since spring 2019, driven by the release of the initial Libra White Paper. However, by mid-2020 they returned broadly to pre-Libra levels. Trading volumes peaked again in 2020, following the outbreak of the coronavirus (COVID-19) crisis and related financial market and crypto-asset turbulences including a bitcoin price nosedive which led investors to turn to stablecoins.

²⁵ Blockdata (2019) reports about 134 project announcements as of 2019.

²⁶ Number currently being traded on crypto-asset trading platforms based on information retrieved from Coinmarketcap.

²⁷ See also Bullmann et al. (2019).

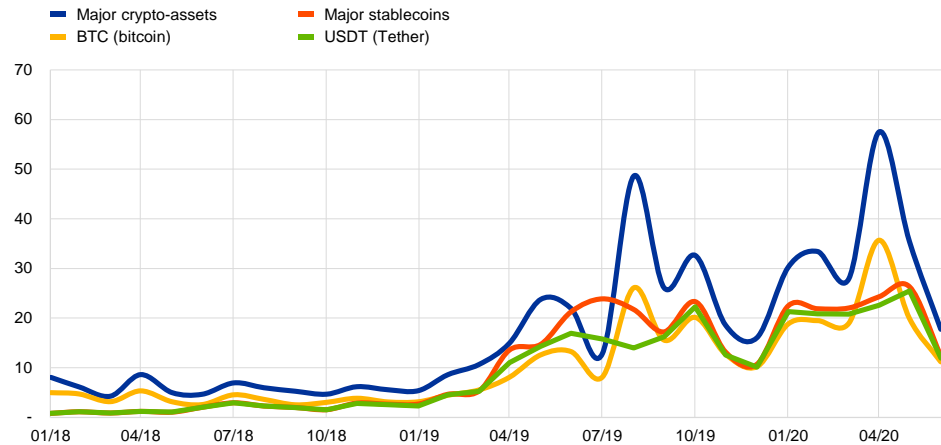
²⁸ Blockdata (2019) reports 26 initiatives closed (i.e. no longer operational) as of 2019.

²⁹ Trading volumes provide a partial measure of the use of the stablecoins generally intended as a means of exchange in the real economy. Data on the use of stablecoins for retail payments are not currently available.

Chart 1

Trading volumes

(USD billion, Jan. 2018 – June 2020, end-of-month data)



Sources: Cryptocompare and ECB calculations.

Notes: The coverage included on the chart is as follows: major crypto-assets: BCH (bitcoin cash), BTC (bitcoin), EOS (Eos), ETH (Ethereum), XLM (Stellar), XRP (Ripple) and major stablecoins: DAI (Dai coin), GUSD (Gemini Dollar), PAX (Paxos Standard), TUSD (TrueUSD), USDC (USD coin) and USDT (Tether).

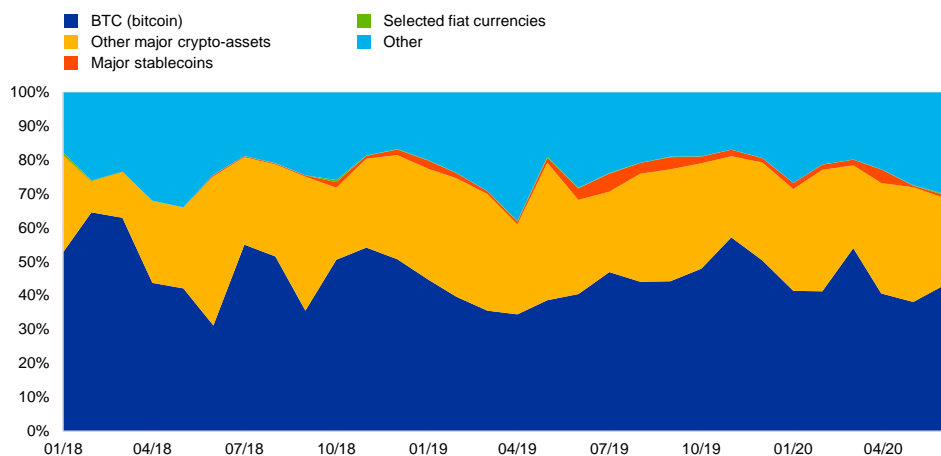
Trading data confirms earlier findings that the prevalent use case of stablecoins is to provide a store of value for revenues related to crypto-asset investments.

Trades of Tether versus those of crypto-assets, and especially versus those of bitcoin, constitute the vast majority of all trades, while trades of Tether versus those of other stablecoins and fiat currencies are very small (see Chart 2). Although most stablecoins are referenced to international fiat currencies of USD, EUR, GBP, or baskets thereof, the volumes of direct trades of stablecoins versus those of fiat currencies are insignificant, which further supports the aforementioned observation regarding the original stablecoin function.

Chart 2

Trading volumes of Tether vis-à-vis crypto-assets and fiat currencies

(percentages, Jan. 2018 – June 2020, end-of-month data)

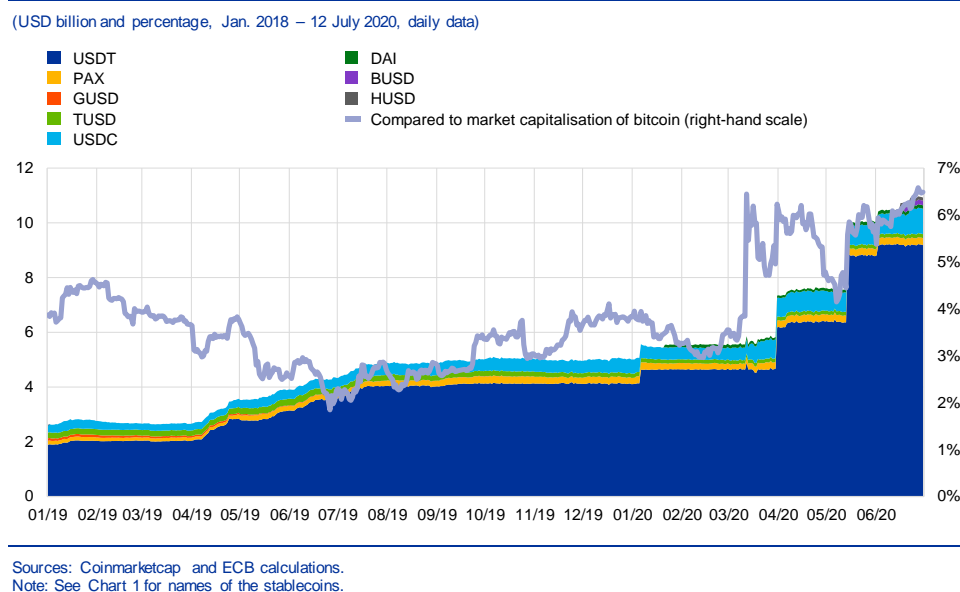


Sources: Cryptocompare and ECB calculations.

Note: For coverage see Chart 1.

Market capitalisation of major stablecoins represents a fraction (6.5%) of that of bitcoin, however it increased multi-fold only in 2020. The driver behind the increased market capitalisation was a growing supply of stablecoins, which has almost tripled for Gemini USD and more than doubled for Tether, USD Coin and DAI since the beginning of 2020 (see Chart 3). The increased supply might have resulted from higher demand from investors amid the start of the COVID-19 crisis.³⁰

Chart 3
Market capitalisation



With respect to prices, the volatility of stablecoin prices is less pronounced than that of popular crypto-assets (see Chart 4). The price volatility varies across stablecoin types, with tokenised funds showing the lowest volatility. Price volatility of both stablecoins and crypto-assets peaked in the first quarter of 2020, while the price volatility of the latter decreased afterwards to the lowest levels since 2019. Price volatility for stablecoins also decreased, although to a lesser degree. Increased volatility for some stablecoins may suggest difficulties in competing against other dominant stablecoins and also vulnerabilities of stablecoin design.

³⁰ See, for example, Coin Metrics (2020).

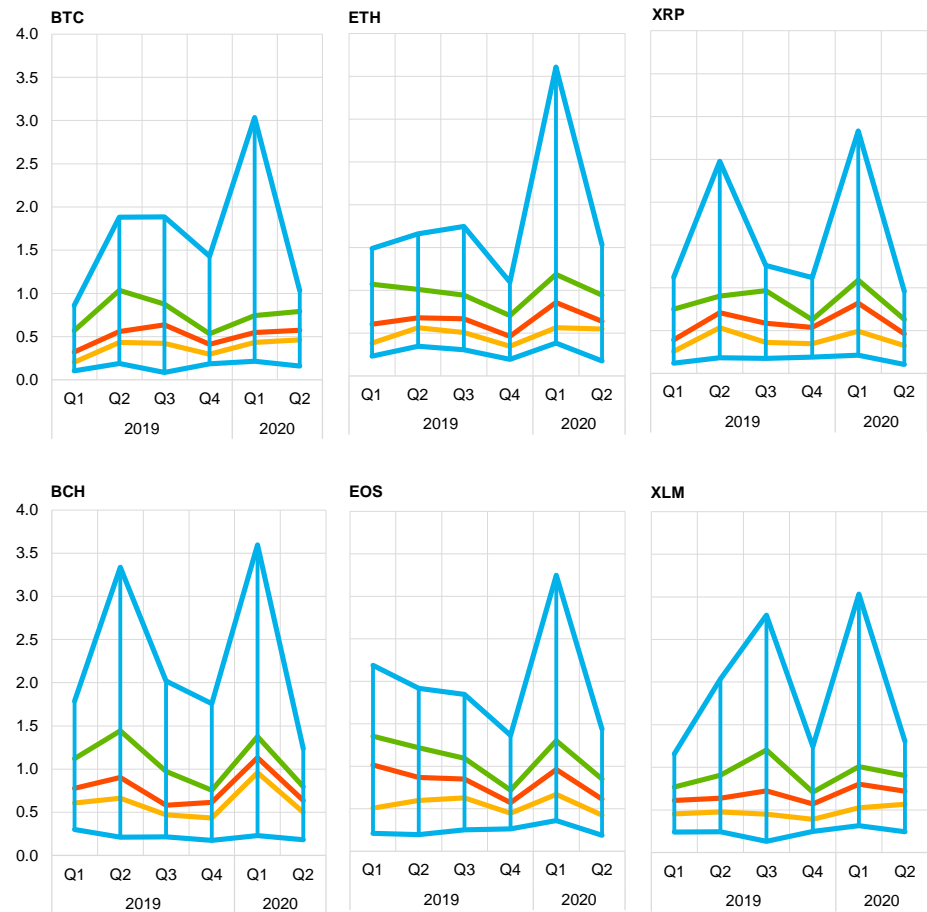
Chart 4

Price volatility

Selected non-stablecoin crypto-assets

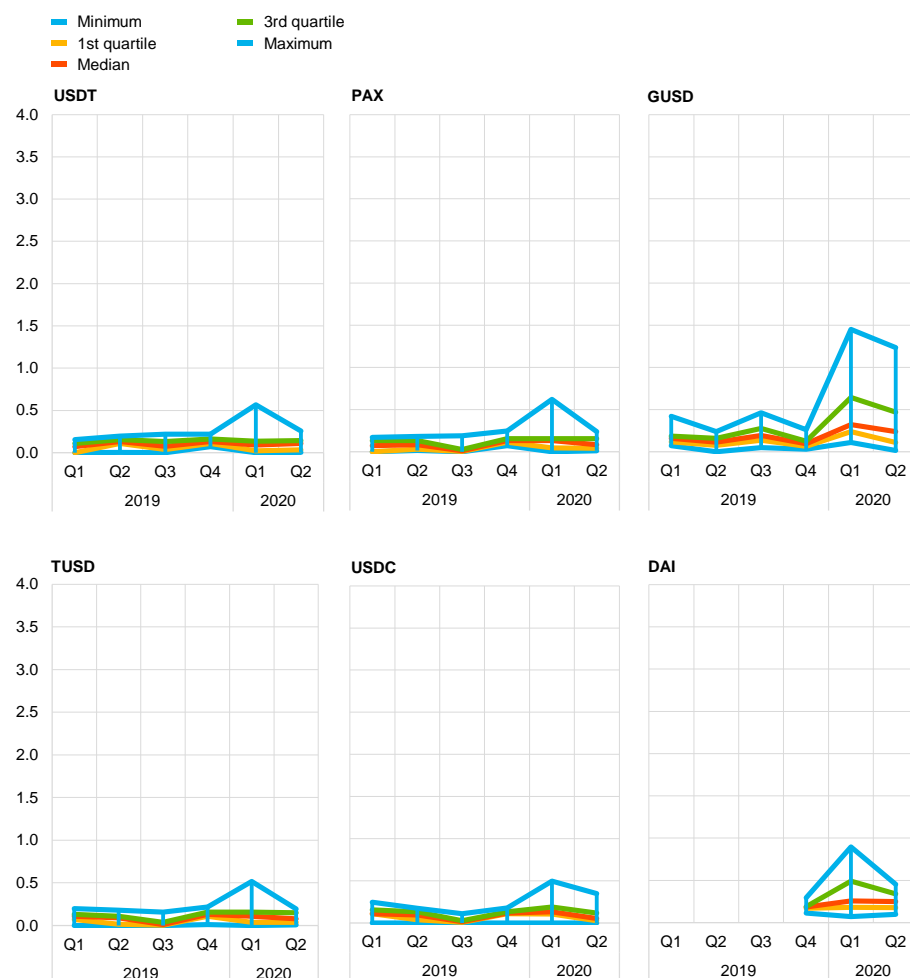
(1 Jan. 2019 – 30 June 2020)

Minimum 3rd quartile
1st quartile Maximum
Median



Stablecoins

(1 Jan. 2019 – 30 June 2020)



Sources: Coinmarketcap and ECB calculations.

Notes: Volatility is measured as the standard deviation of day-to-day per cent changes of rolling seven day windows. Volatility is annualised. Coverage of crypto-asset as in Chart 1.

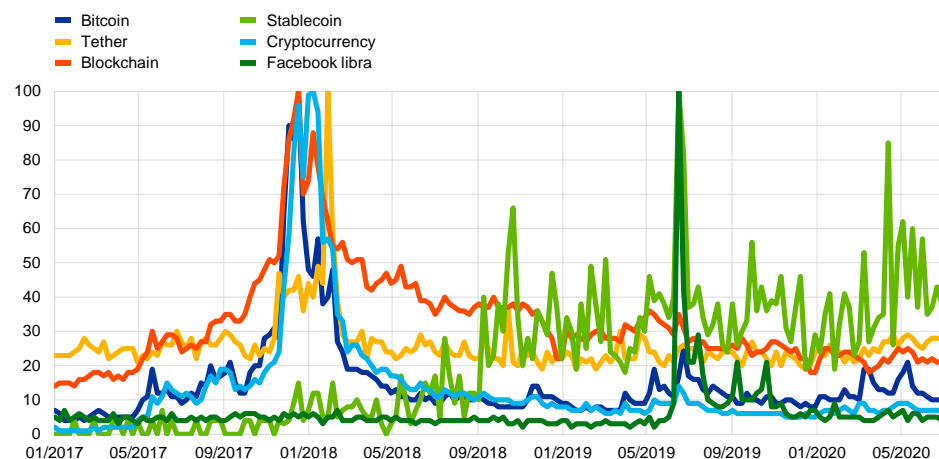
Insights into the current linkages of stablecoins with the real economy and the financial system are hindered by a lack of data. In general, crypto-assets and related technology draw significant public and media attention. Looking at “alternative” data sources, the Google Trends indicators point to significant traffic generated by the searches of terms related to crypto-assets with growing interest in stablecoins (see Chart 5). Turning to the reach of stablecoin initiatives via Twitter, a few hundred thousand follow the accounts of stablecoins, with more than 100,000 followers of Gemini Dollar. Tether and the MakerDAO have 40,000 and 47,700 followers, respectively.³¹

³¹ Data collected on 27 July 2020.

Chart 5

Interest in crypto-assets and related searches

(interest over time, collected on 13 July 2020, weekly data)



Source: Google Trends.

Notes: Interest over time represents search interest worldwide relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. A score of 0 means there was not enough data for this term.

The current status of the market might change significantly as a result of new stablecoin initiatives that purport to provide efficient means of payment for mainstream use cases (e.g. international remittances, cash transfer programmes, international consumer-to-business payments). Furthermore, the involvement of large technology and consumer companies with vast user bases (as in the case of Libra) provides a natural platform for a more significant uptake of stablecoins.³²

³² The Libra Association is progressing swiftly on technical design and development and has recently unveiled a [revised whitepaper](#) – see Libra Association (2020). The Libra Association proposes to offer single-currency stablecoins, in addition to a multi-currency Libra, and to tighten access to the Libra network, among other things. It also submitted a formal application for a payment system licence under the Swiss Financial Market Infrastructure Act to the Financial Markets Supervisory Authority.

4 Risk assessment

This section aims to illustrate the potential impact of stablecoins on the Eurosystem's ability to set the monetary policy stance, maintain financial stability, ensure the safety and efficiency of market infrastructures and payments, and for the conduct of banking supervision.

Based on stablecoins currently in operation (see Section 3), a risk assessment would, in principle, not significantly differ from the current ECB stance on crypto-assets³³, but may change substantially in the light of emerging stablecoin initiatives. The current market capitalisation does not give rise to concerns with regard to the financial stability of the euro area. There is a shortage of data on interlinkages between stablecoins and the financial system but overall EU financial institutions have been applying the same conservative approach as is applied to exposures to crypto-assets. There is limited evidence of existing stablecoins being used for payments outside of the crypto-assets market. Therefore, at the moment, the implications of stablecoins for economic developments and monetary policy would be as negligible as those of crypto-assets. However, emerging initiatives have the potential to provide attractive means of payment and possibly store of value alternatives that can scale up rapidly and become ingrained in the payment habits of EU consumers and businesses.

Stablecoin features play a critical role in influencing the uptake of stablecoins as means of payment and/or store of value, which in turn determine the concrete implications for monetary policy, financial stability, and market infrastructures and payments. As mentioned in Section 2, stablecoins may differ based on their design including, inter alia, levels of price stability vis-à-vis fiat currencies and the conditions for their redemption. In addition to these features, there are several factors that may drive user adoption of stablecoins as means of payment and/or store of value. Three scenarios³⁴ for the potential use of stablecoins can be discerned, the second and third of which are reliant on stablecoin types that offer high levels of price stability and credible redemption policies:

- **“crypto-assets accessory function”**: stablecoins that lack the (perceived) safety and ease of use to compete with established payment means for mainstream use cases continue to cater mostly for the crypto-asset market or specific user needs;
- **“new payment method”**: stablecoins that are convenient, easy to use and also cater for payment use cases and user segments that are typically underserved by existing solutions (e.g. cross-border payments) and at the same time appear to mitigate the main perceived risks (e.g. loss of funds, fraud), becoming an ordinary means of payment;

³³ See ECB Crypto-Assets Task Force (2019).

³⁴ These scenarios are simplified representations of possible future developments.

- **“alternative store of value”**: stablecoins that satisfy user demand for a cheap store of value through (more) attractive remuneration rates and are sponsored by reputable institutions, and may therefore lead their users to replace (part of) their euro deposits and cash with stablecoins.

A fourth scenario could be considered in which the central bank issues a CBDC with technical and functional features similar to those of stablecoins, making their value proposition redundant (at least for domestic payments) and delivering the highest level of stability for users in a monetary jurisdiction. The current paper does not elaborate on this scenario. The possibility of issuing a digital euro, including in relation to the risks associated with stablecoins, and its specific features, is currently being analysed by a Eurosystem high-level task force. In parallel, several central banks (e.g. Sveriges Riksbank, Bank of Canada, People's Bank of China) are conducting practical experimentation – mainly through Proofs of Concept – to explore the technical feasibility and the domestic and international implications of issuing CBDC.

The first scenario is essentially the continuation of the current state of the market, whereas the second and third scenarios are premised on future developments changing the stablecoins landscape. Under the second scenario, notwithstanding the progress made so far in enhancing euro payments, stablecoin initiatives could exploit certain weaknesses or gaps (e.g. lagging instant payments deployment and uptake, slow and costly cross-currency payments) and built-in advantages to compete with existing electronic means of payment. A large-scale substitution under the third scenario is less likely to materialise in situations where confidence in the regulated financial system and financial regulators is high. Furthermore, under certain constraints such as negative interest rates, this scenario would be even more remote if the stablecoin initiative invested (mostly or solely) in negatively remunerated safe assets and were to pass on the negative remuneration of reserve assets to users (see Section 4.1.1). That said, variants of this scenario cannot be ruled out in other economies, in which case there could be spill-overs to the euro area.³⁵

The following sections of this report aim at illustrating the impact of stablecoins, in the second and third scenarios, on the Eurosystem's ability to set the monetary policy stance for the euro area (Section 4.1), maintain financial stability (Section 4.2), and ensure the safety and efficiency of financial market infrastructures and payments (Section 4.3). Finally, Section 4.4 addresses aspects related to banking supervision and prudential regulation.

³⁵ Using the Libra project as an example, Adachi et al. (2020) provides estimates of the potential size of a stablecoin arrangement. The Libra Reserve's total assets under management could range from €153 billion, when Libra coin is mostly used as a means of payment, to around €3 trillion, if it becomes a widely adopted store of value under extreme assumptions.

4.1 Monetary policy

A hypothetical situation in which stablecoins become an “alternative store of value” (the third scenario described above) would have consequences for the transmission of monetary policy and other related issues.

4.1.1 Policy constraints

A non-interest-bearing stablecoin could in principle set a zero effective lower bound on policy rates. Widespread investment into non-interest-bearing stablecoins could induce substitution out of assets yielding negative interest to the point where further cuts in key policy rates no longer transmit to other interest rates in the economy. Such shifts are, however, unlikely to occur in a negative interest rate environment. To be able to offer a zero interest rate on a sustained basis, stablecoin initiatives would have to charge fees to avoid significant losses or alternatively they would have to cross-subsidise the issuance of stablecoins because collateralisation makes them subject to the low rate environment as well. It must also be noted that holding stablecoins entails costs such as foregoing public deposit guarantee schemes or foreign exchange risk for multi-currency stablecoins. Foreign currency-denominated bank deposits already offer a substitution possibility for euro-denominated deposit holders, though they have not been materially exploited as of now.³⁶

4.1.2 Impact on monetary policy transmission via banks

A hypothetical significant use of stablecoins as a store of value under the third scenario could affect the stability and cost of bank deposit funding, which could pose challenges for bank intermediation capacity. As the financial system in the euro area is predominantly bank based, changes in the composition and strength of bank balance sheets can affect the transmission of monetary policy. A significant use of stablecoins as a “new payment method” under the second scenario could reduce banks’ fee and commission income and somewhat dent their profitability, although it would probably not significantly affect their funding conditions. Under the third scenario, banks may need to shift from deposits to more expensive sources of funding, thereby potentially increasing the cost of credit for households and smaller, bank-dependent firms. Further possible implications of stablecoins for SSM banks are discussed in Section 4.4.

³⁶ A significant substitution towards foreign currency-denominated deposits by the money-holding sector has not been observed yet, which is consistent with the fact that most customer deposits in the euro area do not offer a negative interest rate. However, there are indications that, when engaging in international transactions, some banks prefer to be paid in foreign currency rather than in reserves with the Eurosystem, in order to avoid the negative deposit facility rate.

4.1.3 Liquidity and money markets

Under the third scenario, stablecoins might affect the demand for central bank liquidity and thereby the ECB's steering of euro money market rates. Demand for central bank liquidity arises, inter alia, from the need to clear payments in central bank money and to cover liquidity shocks resulting from changes in banknote demand. The effect of stablecoins on central bank reserve demand would depend on the concrete design of the stablecoin and the type of collateral used. The substitution of banknotes and central bank money with stablecoins at a degree envisaged in the second scenario could reduce the demand for ECB liquidity but would not necessarily constrain the ability to steer short-term money market rates, as stablecoin reserves would likely be invested in euro-denominated assets, which would respond to changes in key policy rates.

The issuance of stablecoins might raise questions about the central bank acting as a lender of last resort for the institutions that host the stablecoin's collateral, as users will expect full convertibility into fiat currency. Even if stablecoins are collateralised with high-quality assets (such as commercial bank deposits, money market fund shares and government bonds)³⁷ – as in, for example, tokenised funds – a sudden run on stablecoins would require the liquidation of collateral assets, potentially creating funding strains not only for the stablecoin issuer and for banks but also for investment funds and other entities that do not have direct access to central bank lending operations.

4.1.4 Safe asset demand

Under the third scenario, stablecoins collateralised by high-quality liquid assets (e.g. tokenised funds) might increase the demand for safe assets, thereby possibly affecting asset price formation, collateral valuation, money market functioning and monetary policy space. In the event that deposit holders move from bank deposits to stablecoins, the demand for safe assets could increase overall if the stablecoin arrangement holds a large share of such assets as part of the collateral. Safe asset demand may be especially affected if in other jurisdictions non-euro deposits are substituted for euro-denominated stablecoins on a large scale, as these inflows would have to be collateralised by high-quality assets denominated in euro. A higher demand for euro-denominated safe assets might affect the risk-free yield curve, the exchange rate, asset prices generally and collateral valuation, with potential implications for rate volatility in repo markets and the pass through of monetary policy to prices. In addition, an increased demand for safe assets from stablecoin issuers could also affect monetary policy space by reducing the free-float of securities available for monetary policy operations (i.e. purchases under quantitative easing programmes or collateral in credit operations). However, under reasonably plausible calibration scenarios (i.e. where a limited share of potential users adopt stablecoins), the impact on risk-free rates of the additional demand for euro-denominated safe assets is estimated to be limited. Furthermore, an increased

³⁷ By contrast, if a stablecoin issuer had direct access to the central bank's balance sheet, it would be akin to a narrow bank and its reserves would be sufficient to redeem any withdrawals.

demand for euro-denominated safe assets could also strengthen the international role of the euro and bring economic benefits.³⁸

4.1.5 Exchange rate channel

An extensive use of stablecoins in the second scenario could affect the exchange rate channel of monetary policy and might make it more difficult for monetary policy to control domestic developments, as in the case of dollarised countries.

In the case of multi-currency stablecoins, the exchange rate channel might be affected given that the euro is a global reserve currency and is therefore likely to be included in stablecoin currency baskets. If a multi-currency stablecoin were to be used as an invoicing currency, relative prices would be less affected by domestic monetary policy.³⁹ At the same time, prices could be affected by foreign monetary policy or exchange rate shocks. However, the likelihood of multi-currency stablecoins, such as multi-currency Libra, becoming invoicing currencies is estimated to be low. Specifically, internal analyses indicate that, under plausible assumptions regarding Libra's potential use as an international invoicing currency⁴⁰, the pass through of euro exchange rate movements to import prices would hardly change. In turn, the exchange rate pass through would be stronger if invoicing in Libra accounted for a significantly larger share of euro area imports than assumed above. However, in that case holdings of Libra per user would rise to much larger – and possibly economically implausible – levels. At the same time, the euro area economy might become more exposed to shocks in the value of stablecoins like multi-currency Libra, arising for example from changes in the value of one of the currencies in the basket. Shocks affecting the value of stablecoins collateralised by euro would transmit more directly to the euro area by affecting the purchasing power of the stablecoin holders. In a more extreme scenario, “digital currency areas”⁴¹ might arise (characterised as a global network of payments and transactions in a specific stablecoin), which could increase the international comovement of macroeconomic developments and affect the cross-border transmission of monetary policy. This might make it more challenging for monetary policy to stabilise domestic economic developments.

4.1.6 Monetary policy operations

The monetary policy implications outlined above could affect the size of the Eurosystem's balance sheet and its structure. This impact would be especially pronounced under the third scenario where stablecoins are not only used for payments but also as a store of value. A reduced demand for banknotes and central

³⁸ These benefits include, among others, lower transaction and hedging costs for trading internationally for euro area household and companies, seigniorage, and being able to issue debt at lower interest rates (“exorbitant privilege”).

³⁹ Single-currency stablecoins on the other hand should not carry major implications for the exchange-rate channel.

⁴⁰ The assumptions are that (i) euro accounts for 30% of the basket of currencies backing Libra (which is close to the share of the euro in the SDR basket), and (ii) Libra is used as invoicing currency for 5% of euro area imports – about the combined shares of the renminbi and yen in global payments.

⁴¹ See Brunnermeier and Niepelt (2019).

bank reserves, which could be the case already in the second scenario, would lead to a smaller balance sheet and less seigniorage income. If in addition stablecoins were used as a store of value, this would increase the demand for safe assets as outlined in Section 4.1.4. In turn, this could lead to scarcity of eligible assets for central bank policy operations such as asset purchases and open market operations.⁴² In addition, risks arising from traditional counterparties could increase if the use of stablecoins had financial stability implications for the banking system. If the risk of financial instability increased beyond the traditional banking sector, the central bank might consider interacting with a wider range of counterparties. Financial stability issues will be discussed in the following section.

4.2 Financial stability

Both fragilities within the stablecoin arrangement and the interconnectedness with the financial systems represent sources of financial stability risks. As the G7 report on global stablecoins and the FSB consultative document on the regulatory, supervisory and oversight challenges of global stablecoin arrangements⁴³ have already analysed and identified a vast array of financial stability risks from stablecoin arrangements, the following paragraphs will focus on the two most prominent risks: risk of a liquidity “run” impairing the functioning of the stablecoin arrangement, and risk of contagion to the wider financial system emanating from an impaired stablecoin arrangement.⁴⁴

4.2.1 Liquidity run

The value of stablecoins may be exposed to risks inherent in the investment in non-zero risk financial assets such as credit, liquidity, market and foreign exchange (FX) risks. An important question from a financial stability perspective is: who ultimately bears the investment risks? If the stablecoin arrangement does not guarantee any fixed value of the stablecoin, this will move in tandem with the value of the “collateral” (see Section 2). In this case, the end user is the bearer of all risks and the stablecoin is equivalent in substance to a fund share with the price equal to the fund’s net asset value. There is no solvency risk for such an arrangement as it is akin to a “pass through” structure.

Runs on the stablecoin arrangement could occur if end users lose confidence in the issuer or its network. This could happen, for example, if an adverse event occurs (such as a cyberattack to the system or theft from wallet) or if end users realise that the collateral assets are losing value, thereby casting doubts on the value of the stablecoin. Such a realisation could trigger substantial redemptions of stablecoins which could be amplified to the extent that end users misconceive stablecoin holdings as a substitute of bank deposits.

⁴² By contrast, if stablecoins kept the collateral in central bank reserves, this could lead to an expansion of the balance sheet.

⁴³ See Financial Stability Board (2020).

⁴⁴ For more detailed discussion, see Adachi et al. (2020).

Runs could also occur when the stablecoin arrangement guarantees a fixed value of the stablecoin (e.g. some tokenised funds). In this case, any losses stemming from its investment are borne by the stablecoin issuer (or whoever provides such guarantees), including losses from exchange rate fluctuations if relevant. Therefore, confidence in the stablecoin and its arrangement depends critically on the loss absorption capacity of the guarantor and doubt thereof could trigger a run on the stablecoin arrangement. (By implication, applicable regulatory requirements have to be sufficiently comprehensive to addressing complex and interrelated risks posed by the stablecoin arrangement.)

4.2.2 Contagion effects

In the event of a run on a stablecoin with the scale envisaged in the second and third scenarios, the liquidation of assets to cover redemptions could have negative contagion effects on the financial system. It should be noted that shocks to the stablecoin arrangement in emerging markets with weak institutional capacity (such as operational incidents) could spill-back to advanced economies in which the pool of collateral assets mostly reside. Moreover, some components of the stablecoin arrangement (e.g. designated dealers) may stop their function in a manner similar to that observed in the 2007 global financial crisis when securitisation vehicles' redemptions were suspended.

Short-term government debt markets would be most profoundly affected in such scenarios. As the stablecoin arrangement might represent a significant investor in the short-term government debt market, runs on it would translate to large price volatility and illiquidity spikes. In addition, the stability of bank funding may be weakened as stablecoin holders may have moved funds from bank deposits to global stablecoins, creating a banking system in which sticky retail deposits are replaced with institutional deposits as noted in Section 4.1.2.

Banks would be affected through multiple channels in a run: those banks which have received the arrangement's collateral could experience a sudden deposit withdrawal as noted above; those engaged in the arrangement as actors (designated dealers, third-party trading platforms, etc.) could be subject to associated market volatility and also with reputational risks for their role.

4.3 Market infrastructures and payments

The core transfer function of a stablecoin arrangement, regardless of the design of the technical platform (e.g. centralised versus decentralised), can be characterised as a payment system (see Section 2).⁴⁵ Therefore, like other payment systems, stablecoin arrangements that are not properly managed can be a source of large-scale disruption and even systemic risk in the second and third scenarios.

⁴⁵ Certain stablecoin arrangements may also undertake functions of other financial market infrastructures (e.g. central securities depositories).

Separately from their core transfer function, stablecoin arrangements also incorporate a function to provide end users with a means of payment similar to payment schemes. While payment schemes do not give rise to systemic risk concerns, their orderly functioning facilitates secure and effective payment instruments that meet users' needs and are critical for maintaining public trust in the euro.

4.3.1 Risks posed and borne by stablecoin arrangements in their transfer function

The multiplicity of functions and entities involved in stablecoin arrangements raises questions around governance. On the one hand, the involvement of a large spectrum of stakeholders supports the consideration of diverse market interests and views. On the other hand, a highly complex governance structure could hamper the decision-making process pertaining to the arrangement's design and technological evolution or by slowing incident responses related to operational issues. Furthermore, arrangements that rely on intermediaries and third-party providers also bear risks from, and pose risks to, these entities. Clear and transparent governance is all the more important for arrangements that operate in multiple jurisdictions and/or currency areas – as envisaged in global retail stablecoin initiatives.

Stablecoin arrangements that use DLT incur the potential benefits and drawbacks inherent in any distributed setup in terms of operational reliability and resilience. Benefits of using multiple synchronised ledgers and multiple processing nodes include reducing the risk from a single point-of-failure. At the same time, any arrangement operated by many parties is more prone to cyber risk since it has a larger attack surface. In this regard, cryptographic tools play a critical role in ensuring the security and confidentiality of information stored on the distributed ledger. Furthermore, distributed ledgers are inherently more complex and potentially resource-intensive to operate compared to traditional systems.

Stablecoin arrangements operating in a cross-jurisdictional context and/or on a global scale may pose specific risks such as heightened legal risk. Uncertainties regarding the applicable law and/or the competent court(s) in case of disputes may result in conflict-of-law issues. This is in addition to the complexities around the legal and regulatory classification of the asset and the mapping of an arrangement's function to the domestic legal and regulatory framework outlined in Section 2 and the discussion around the legal underpinning of arrangements based on DLT in some jurisdictions e.g. regarding the ownership or transfer of assets, and settlement finality.

4.3.2 Implications for Eurosystem oversight

Preliminary analysis⁴⁶ suggests that the CPMI-IOSCO PFMI provide a sufficient basis for authorities to assess the systemic importance of stablecoin

⁴⁶ See Annex 4 of Financial Stability Board (2020).

arrangements, to ensure their safety and efficiency, and to cooperate with other relevant authorities. While the CPMI-IOSCO has identified no need for an amendment of the PFMI at this time, the application of PFMI to stablecoin arrangements may require further guidance regarding the interpretation of current requirements in the light of the specificities of stablecoin arrangements.

The PFMI provide guidance for relevant authorities to assess the systemic importance of payment systems which, complemented by the qualitative and quantitative factors identified by the relevant authorities, could also inform the assessment of the systemic importance of stablecoin arrangements for the purpose of PFMI application. The regulation of the ECB on oversight requirements for SIPS sets quantitative criteria for the assessment of systemic importance.

The entities involved in the transfer function of a stablecoin arrangement could be subject to the Eurosystem's oversight. A decision in this respect would consider the qualification of the asset/activity under EU regulation. For example, if an asset qualifies as e-money and its issuer is supervised according to EMD2, it is likely that the respective arrangement qualifies as a payment scheme under the Eurosystem's oversight framework. The respective arrangement could still be subject to oversight as a (proxy to) payment system (provided the criteria outlined in Section 2 were fulfilled) and/or payment scheme.

As the criteria for the identification of a SIPS are linked to the activity of clearing and settling euro-denominated payments, the SIPS regulation might not apply to stablecoin arrangements that handle payments denominated in another currency or unit of account, yet the system could be subject to the general payment system oversight framework. In fact, the Eurosystem oversight policy framework is not limited to systems that clear and settle euro-denominated payments. The Eurosystem would still be in a position to apply the PFMI, or a subset thereof, to a non-euro-denominated system that is located in the euro area even though the system is not subject to the SIPS regulation.

Stablecoin arrangements could also qualify as payment schemes (see Section 2). The ongoing review of the Eurosystem oversight framework for payment instruments and schemes should ensure that payment schemes based on stablecoins that are denominated in, funded by or collateralised by euro, fall under oversight. It is further noted that, in the event that a stablecoin arrangement qualifies as a payment scheme, but not as a payment system, the clearing and settlement function of the arrangement could be regarded as an associated function of the scheme and be subject to oversight.

Stablecoin arrangements that settle euro-denominated transactions may warrant the application of the Eurosystem's location policy. If a stablecoin arrangement were to reach a certain threshold⁴⁷, it would have to be operationally and legally located in the euro area under such policy. For other offshore payment systems

⁴⁷ The location policy requirement applies to all payment systems that either settle more than €5 billion per day, or account for more than 0.2% of the total daily average value of payment transactions processed by euro area interbank funds transfer systems which provide for final settlement in central bank money (whichever of the two amounts is higher).

settling euro-denominated transactions or payment systems with significant funding/defunding in euro, the Eurosystem would seek cooperative oversight.⁴⁸ In case banks are used to execute economic functions of a stablecoin arrangement, the already established supervisory arrangements for cross-border coordination will be employed and amended, if need be, according to the specific arrangement.

Stablecoin arrangements established outside of the EU should be subject to international cooperative oversight arrangements comprising all relevant authorities that have a legitimate interest. Responsibility E of the PFMI (together with the Lamfalussy principles for offshore payment systems⁴⁹) provides a strong basis for such cooperation, and allows for the involvement of other relevant regulatory and supervisory authorities if deemed necessary. As an example, the Swiss authorities created the “Libra College” for the oversight of Libra in which the ECB was invited to take part. It is, however, noted that the Eurosystem would have no legal means to enforce such cooperation but would rely on moral suasion (name and shame).

4.3.3 Implications for the retail payments market

Stablecoins of the types described in the second scenario may alter the current retail payments landscape in Europe and globally. Both the international payments landscape – with relatively slow and costly cross-currency transfers – and a fragmented European retail payments market (e.g. in the front-end of instant payment solutions at the point of interaction) provide opportunities for stablecoins to meet users’ demand in terms of speed, affordability, access or convenience. Some initiatives (e.g. Libra) can leverage existing consumer platforms to maximise user convenience and expedite take-up (e.g. through incentives). This might affect the level playing field in payment services and contribute to increasing Europe’s dependence on global players in the area of payments.

Stablecoin arrangements may also pose concerns for EU market integration and interoperability. Stablecoin arrangements may fall outside of the scope of SEPA Regulation that harmonises the way cashless euro payments are made across Europe and mandates interoperability. While a stablecoin initiative such as Libra may de facto ensure pan-European coverage, pan-European reachability (intended as all consumers having the ability to make payments at the national and EU level under the same conditions) may require a deliberate effort. Furthermore, in the event of multiple stablecoin arrangements, fragmentation may occur across the arrangements’ networks. From a demand side perspective, users may face trade-offs between convenience on the one hand and additional costs (e.g. cash-out and other fees, idle balances) and switching barriers on the other hand.

⁴⁸ With regard to oversight of cross-border FMIs, Responsibility E of Committee on Payments and Market Infrastructures and the International Organisation of Securities Commissions (2020) foresees cooperation with other authorities at international level where appropriate. Cross-border cooperation among relevant authorities is typically initiated by the authority of the system’s home jurisdiction. The authority of the home jurisdiction usually has the primary responsibility for the oversight of the system.

⁴⁹ See Committee on Payments and Market Infrastructures (1990).

4.3.4 Implications on the use of euro banknotes for payments

In the second and third scenarios, stablecoins are likely to coexist with cash in payment transactions. This is due to the unique characteristics of cash – being physical – while stablecoins will primarily compete with other electronic means of payment at least in a short/medium term. Even in a scenario where stablecoins satisfy the demand for storing value, they are likely to coexist with euro banknotes. This applies also to the demand from outside the euro area. There, in fact, euro banknotes are often held by people who do not trust the currency or banking system in their own countries, and trust instead an international currency, especially in physical form, i.e. cash. It is hardly imaginable that in such situations people will store their last resort assets in a digital form. It is estimated that about 30% of the total euro banknotes demand originates from outside the euro area.

4.4 Banking supervision and prudential regulation

The possible involvement of supervised institutions in stablecoin arrangements would both support the materialisation of scenarios in which stablecoins effectively fulfil a payment and/or store of value function and have manifold implications for these institutions. A role for banks in these situations would reflect on ECB supervision and the adequacy of prudential regulatory treatment of emerging assets.

4.4.1 Possible roles of SSM banks in stablecoin arrangements

A stablecoin arrangement may rely on banks to ensure its orderly functioning.⁵⁰ SSM banks could take up a variety of roles in stablecoin arrangements to facilitate the creation, redemption, circulation and use of stablecoins. They could fulfil three broad types of non-mutually exclusive roles in a generic stablecoin arrangement to support its core functions (stabilisation, transfer, user interaction) also taking into account jurisdictional restrictions.

1. Provision of various services to the stablecoin arrangement's stabilisation function, as e.g. (i) members of the governance body of stablecoin arrangement who share the responsibility of managing its assets; (ii) custodians of collateral assets; (iii) asset managers; (iv) prime brokers. In the secondary market, banks could act as market makers on exchanges, or exchanges per se, thereby helping to stabilise the price of the stablecoin. They could also support a stablecoin arrangement's stabilisation function indirectly by e.g.: (i) receiving deposits from the stablecoin arrangement, likely to interest-bearing accounts or

⁵⁰ According to Financial Stability Board (2020), in some jurisdictions stablecoin arrangements already deposit funds at major banks. This has the potential to: (i) create an additional layer of intermediation between households and banks; (ii) reduce the stability of bank funding in stress conditions; (iii) impact the functioning and resilience for the financial markets (e.g. short-term government bonds) in which reserve funds are invested (see also Sections 4.1 and 4.2). Currently these risks are likely small given the small scale of existing stablecoin arrangements compared to the balance sheets of major banks. However, there are limited data to assess such bank exposures.

securities/investments; (ii) selling assets (e.g. short-term government securities) to the stablecoin arrangement; (iii) providing FX conversion services; (iv) offering hedging services, e.g. via derivatives, or market access to such services with other third parties.

2. Operation of a validating node in the DLT transfer mechanism.
3. Facilitation of the stablecoin arrangement's interaction with users, as e.g. providers of custodian wallets and payment services in stablecoins.

Banks' role in stablecoin arrangements could also go beyond supporting the core functions, as they could benefit from synergies via the offer of additional services. For example, banks could take deposits and extend credit in stablecoins, including via fractional reserve banking. There could be new forms of cross-selling, such as offering certain financial services or products exclusively to stablecoin users or at preferential rates. Furthermore, custodian wallets might be linked with other financial services (e.g. payment account aggregation services) and create a demand for stablecoin ATMs and merchant acceptance services. Finally, if global stablecoins fostered greater access, they could trigger demand for additional bank services.

Banks could be subject to a wide range of risks through the provision of such services, such as governance, liquidity, market, credit, operational and technological, legal and compliance risks. Governance risk may arise from banks' lack of understanding of the risks of stablecoins and impaired ability to engage in effective risk assessment and decision-making and to establish adequate controls. Banks that receive deposits from stablecoin arrangements could be exposed to funding risk, whereas banks-resellers are subject to market liquidity risks in situations of loss of confidence in the stablecoin. Changes in the valuation and pricing of holding of stablecoins could be a source of risks for banks engaging in trading, dealing, and market making. Credit risk ranges from intraday exposures to loss of equity in the event that the project fails. A stablecoin arrangement's endpoints could be subject to cyberattacks, leading to e.g. private keys held by banks being stolen. Stablecoin arrangements may experience operational issues with reputational and legal implications also for banks. Finally, banks that undertake activities in a stablecoin arrangement or the broader ecosystem will need to consider the application of regulatory framework to their businesses.

Providing financial services to a stablecoin arrangement or within the broader stablecoin ecosystem might not be a profitable strategy for banks in the long run. Especially on initiatives sponsored by large technology companies, the proliferation of innovative products and services may not be sustainable if returns do not outweigh the increased operational complexity and the loss of direct access to transactional data flows that banks would otherwise accumulate and use to their business advantage.

Banks may also face increased competition. In the second scenario ("new payment method"), stablecoins could exert pressure on commissions and fees charged by banks for payments and transfers. Increased competition may also erode revenues that banks currently obtain from the payment card business.

4.4.2 Supervisory powers

Activities undertaken by SSM banks in the context of stablecoin arrangements (see Section 4.4.1) would not constitute regulated financial services pursuant to current EU law but rather ‘other business activities’ of credit institutions.

Crypto-asset (bitcoin-like) related activities also fall under this category.

Even if stablecoin-related activities of credit institutions fall outside of the scope of regulated activities, supervisors have available a range of supervisory powers in the Capital Requirements Directive (CRD IV)⁵¹ that could provide a tool to mitigate relevant risks. In detail, in carrying out other business activities, as mentioned in Article 74 of CRD IV on internal governance, credit institutions must have in place appropriate arrangements to mitigate the operational (including IT) and reputational risks involved. In any case, other powers may also be available under the national laws (e.g. to prohibit other business activities not linked to the carrying out of regulated financial services where this activity could impair the financial soundness of the firm concerned).⁵² The same could apply for CRD IV Article 97 (supervisory review and evaluation process) and Article 104 (supervisory powers).

Further, the EBA Guidelines on internal governance under Directive 2013/36/EU⁵³ as well as the EBA Guidelines on outsourcing arrangements⁵⁴ could be relevant. Supervisors may need to assess governance issues that banks face when entering stablecoin arrangements, as well as the sufficiency of qualified staff in all three lines of defence. Moreover, contractual agreement should comply with the regulatory framework and the right to audit should be warranted for both the bank and the supervisors. Banks should also include specific clauses, as appropriate, ensuring the continuity of operations in case the institution were to face resolution.

As a best practice, the assessment should always take place on a case-by-case basis, taking into account the specifics of each arrangement. The main focus should be the assessment of potential risks that such activities involve, while maintaining a technology-neutral position.

4.4.3 Prudential/accounting treatment

In general, apart from the appropriate risk management framework previously mentioned, the risks inherent in stablecoins will have to be captured in a very

⁵¹ Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC (OJ L 176, 27.6.2013, p. 338).

⁵² The EBA has highlighted multiple times via warnings and opinions the risks (especially money laundering and terrorist financing) arising from two emerging forms of activity involving crypto-assets: (1) crypto-asset trading, usually through digital platforms operated by providers engaged in exchange services between crypto-assets and fiat currencies or other crypto-assets (e.g. the exchange of virtual currencies such as bitcoin or Ethereum), and (2) custodian wallet provision (services to safeguard/store private cryptographic keys granting rights to access and transfer crypto-assets).

⁵³ European Banking Authority (2017).

⁵⁴ European Banking Authority (2019b).

conservative manner via Pillar 1 or even supplemented by Pillar 2 requirements, if necessary.

In its analysis on crypto-assets, the ICA-TF concluded that the regulation on prudential requirements for credit institutions (CRR⁵⁵), as it currently stands, is not tailored to crypto-assets with high volatility and advocated a common conservative prudential treatment for crypto-assets. The ICA-TF favoured Pillar 1 full deduction from CET1 similarly to other assets classified as “intangible assets” under the accounting framework. The ECB position is aligned with the international standard-setters, in particular the Basel Committee for Banking Supervision (BCBS). The BCBS has issued a discussion paper⁵⁶ seeking stakeholders’ views on the prudential/accounting regulatory treatment of crypto-assets. Regarding stablecoins, it is of the view that these assets warrant further assessment and elaboration before specifying a prudential treatment.

According to CRR Article 24, the valuation of assets and off-balance sheet items shall be effected in accordance with the applicable accounting framework. Therefore, should a bank hold stablecoins, the prudential treatment (particularly from a solvency and liquidity perspective) will depend on the IFRS classification of stablecoins as, among other things: cash or cash equivalent (IAS 32), other financial instrument (IAS 32), inventory (IAS 2), intangible asset (IAS 38 – as for crypto-assets in the ECB recommendation). Discussions around the accounting classification of stablecoins are still ongoing and might ultimately differ from crypto-assets due to the different features of these assets, e.g. lower volatility⁵⁷ or collateral. A different accounting treatment under the current regulatory framework also automatically results in a different prudential treatment. Even if full deductions under Pillar 1 do not apply, supervisory considerations in the context of the Pillar 2 framework could still be applied, subject to their risks and according to their materiality following the principle of proportionality.

As some of the ECB supervised institutions might in the future be materially exposed to stablecoin initiatives, it is important that a prudential treatment is developed as soon as possible. CRR provisions will have to be applied to these entities operating in the EU and the risks inherent to stablecoins will have to be captured either via Pillar 1 or Pillar 2, as well as by adopting the appropriate risk management frameworks. A timely prudential treatment could prevent banks from accumulating exposures in a prudential void.

⁵⁵ Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation No 648/2012 (OJ L 176, 27.6.2013, p. 1).

⁵⁶ See Basel Committee on Banking Supervision (2019).

⁵⁷ According to Bullmann et al. (2019), the average volatility, expressed as the annualised average seven-day standard deviation of daily returns between 27 December 2017 (the earliest date when all three stablecoins considered were traded) and 28 July 2019 was 10% for Tether USD, 27% for Dai and 37% for NuBits (now defunct). The same measure of volatility applied to the five crypto-assets with highest market capitalisation in the same period gave values of 69% for Bitcoin, 91% for Ether, 100% for XRP, 117% for Bitcoin Cash, and 96% for Litecoin. See also Section 3, Chart 4.

5 Conclusions

The term “stablecoin” may be perceived to have positive connotations in terms of stablecoins’ intrinsic stability and usability as a form of money but these features are neither intrinsic to, nor a prerogative of, stablecoins in and of themselves – instead they can be attained only through appropriate design and effective risk management. As regulatory principles are established and approaches are defined, the term “stablecoin” should be replaced by a choice of terminology to shift the emphasis away from the issuer’s promise of stability.

The implications of stablecoins for monetary policy, financial stability, market infrastructure and payments, and banking supervision depend on the specific scenario for the uptake of stablecoins as a result of their concrete features and EU user demand. Of all scenarios, stablecoins as an alternative store of value is currently the most remote since stablecoin arrangements through collateralisation will not be exempted from a low rate environment. Besides, deposits and cash have proved resilient to existing alternatives. That said, the uptake in other currency areas of stablecoins collateralised with euro-denominated assets could have implications on the Eurosystem’s monetary policy transmission, which are beyond its control.

Under more plausible scenarios, the Eurosystem has a range of instruments at its disposal to manage the impact of stablecoins on its mandate and tasks. The Eurosystem’s oversight framework will cover stablecoin arrangements that qualify as payment systems, regardless of the technology used and organisational setup. Furthermore, stablecoin arrangements that set standardised and common rules for the execution of payment transactions between end users may fall under the oversight framework for payment instruments and schemes, which is currently in the being revised. From a banking supervision perspective, competent authorities have a range of supervisory powers (based on CRD articles) that can be applied to mitigate the risks stemming from stablecoin-related activities of supervised institutions. Banks should put in place an appropriate risk management framework commensurate to their role in stablecoin arrangements.

The application of these tools needs to be underpinned by adequate, internationally coordinated regulation and cooperative oversight. The general principle “same business, same risks, same rules” should guide regulatory efforts to ensure a level playing field and prevent regulatory arbitrage. Further work may be necessary for international standard setting bodies to address emerging risks. This may include, for example, developing an appropriate accounting and prudential treatment. Given the global nature of stablecoin arrangements, an EU regulatory approach cannot be developed in isolation, but should be informed by ongoing efforts of standard setting bodies. In this respect, the effective oversight and supervision of stablecoin arrangements that span multiple jurisdictions requires relevant authorities to collaborate under the umbrella of international cooperative oversight arrangements.

The Eurosystem continues monitoring the evolution of the stablecoins market to be able to respond to rapid changes in all possible scenarios. Eurosystem

action aims to be commensurate to the risks identified, and to preserve public policy priorities as needed while enabling private sector initiatives to safely extract the most value from technological innovations, to the benefit of a wide range of users. In parallel, this task may entail fostering central bank innovations to cater for a changed environment in the payment space and altered conditions for the exercise of a central bank's core mandate.

References

Adachi, M. Cominetta, M., Kaufmann, C. and van der Kraaij, A. (2020), “A regulatory and financial stability perspective on global stablecoins”, *Macprudential Bulletin*, Issue 10, ECB, Frankfurt am Main, March.

Basel Committee on Banking Supervision (2019), *Discussion paper – Designing a prudential treatment for crypto-assets*, Bank for International Settlements, December.

Blockdata (2019) *Stablecoins – An overview of the current state of stablecoins*, June.

Brunnermeier, M. K., and Niepelt, D. (2019), “On the Equivalence of Private and Public Money”, *Working Paper Series*, No. 25877, NBER, Cambridge, May.

Bullmann D., Klemm, J. and Pinna, A. (2019), “In search for stability in crypto-assets: are stablecoins the solution?”, *Occasional Paper Series*, No 230, ECB, August.

Coin Metrics (2020) “[Weekly Feature: The Rise of Stablecoins](#)”, *Coin Metrics’ State of the Network*, Issue 59 Weekly Feature, published online; last accessed 15 September 2020.

Committee on Payments and Market Infrastructures (1990), “Report of the Committee on Interbank Netting Schemes of the central banks of the Group of Ten countries (Lamfalussy Report)”, *CPMI Papers*, Bank for International Settlements, November.

Committee on Payments and Market Infrastructures (2019), “Wholesale digital tokens”, *CPMI Papers*, No 190, Bank for International Settlements, December.

Committee on Payments and Market Infrastructures and the International Organisation of Securities Commissions (2012), “Principles for financial market infrastructures”, *CPMI Papers*, No 101, Bank for International Settlements, April.

Council of the European Union (2019), [Joint statement by the Council and the Commission on "stablecoins"](#), published online, last accessed 15 September 2020.

ECB Crypto-Assets Task Force (2019), “Crypto-Assets: Implications for financial stability, monetary policy, and payments and market infrastructures”, *Occasional Paper Series*, No 223, ECB, Frankfurt am Main, May.

European Banking Authority (2019a), *Report with advice for the European Commission on crypto-assets*, January.

European Banking Authority (2019b), *Final Report on EBA Guidelines on outsourcing arrangements*, February.

European Banking Authority (2017), *Final Report Guidelines on internal governance under Directive 2013/36/EU*, September.

European Central Bank (2019), “Stablecoins – no coins, but are they stable?”, *In Focus*, No. 3, November.

European System of Central Banks (2020), [European System of Central Banks \(ESCB\) response to the European Commission’s public consultation on EU framework for markets in crypto-assets](#), ECB, Frankfurt am Main, April, published online, last accessed 15 September 2020.

Financial Stability Board (2020), *addressing the regulatory, supervisory and oversight challenges raised by “global stablecoin” arrangements – Consultative document*, April.

G7 Working Group on Stablecoins (2019), *Investigating the Impact of Global Stablecoins*, October.

Libra Association (2020), [White Paper v2.0](#), published online, last accessed 15 September 2020.

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