

# ARTICLE – Cryptoassets and their impact on financial stability

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The market for cryptoassets has grown a lot in a short time.<sup>102</sup> Between the beginning of 2018 and the end of April 2022, the market value of the world's total cryptoassets has increased from just over USD 600 billion to almost USD 1,300 billion. However, the market is generally unregulated in many countries, and the International Monetary Fund (IMF) and the Financial Stability Board (FSB) have assessed that the risks associated with cryptoassets may affect financial stability if the market continues to grow without the risks being managed.

In this article, we describe what cryptoassets are and focus on the most common ones.<sup>103</sup> We also examine the risks that cryptoassets can create and the regulatory initiatives that have been taken in this area in recent years. The article focuses mainly on the global development, but it also analyses developments in Sweden. The risk that shocks in the market for cryptoassets will threaten Swedish financial stability is currently considered to be small. However, these could jeopardise stability further ahead if, for example, the exposures of banks and institutional investors increase.

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## The market for cryptoassets has grown rapidly and consists of various kinds of assets

### Digital assets without underlying collateral

Cryptoassets are a kind of digital asset. The largest cryptoassets, based on market value, are Bitcoin and Ethereum (also known as Ether). They are examples of a category of cryptoassets that are unbacked (i.e. have no underlying collateral) and do not have a central issuer (in this article called “unbacked cryptoassets”). This is a difference compared to ordinary currencies that have a central issuer in the form of a central bank. There is therefore nobody guaranteeing that they will retain their value over time, or that they can be exchanged for ordinary currencies. The value of these cryptoassets can therefore vary in an uncontrolled manner without any intervention,

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<sup>102</sup> For further information, see also H. Eklöf (2022), “An overview of fintech and cryptoassets”, *Staff Memo*, May, Sveriges Riksbank.

<sup>103</sup> Cryptoassets are also known as cryptocurrencies. The Riksbank deems cryptoassets to be a more appropriate term than cryptocurrencies. One reason for this is that cryptoassets lack the institutional and legal framework that ordinary currencies have.

as a central bank, for example, would intervene to maintain the monetary value of an ordinary currency.

### **Stablecoins try to maintain a stable value through a reserve of assets**

However, there are cryptoassets that generally have underlying collateral and a central issuer. These are called stablecoins and are intended to maintain a stable asset value, often by following the price of an ordinary currency, such as the US dollar.<sup>104</sup> They therefore often have a reserve of assets that should correspond to the value of the stablecoins issued. The reserve may consist of anything from bank deposits to various financial instruments or other cryptoassets.

Three of the highest market value stablecoins – USD Tether, USD Coin, and Binance USD – are intended to follow the value of the US dollar. There are also stablecoins that are intended to follow, for example, the value of the euro, but the overall market value of these is still low. At present, there are no stablecoins linked to the Swedish krona that have any significant volumes.

### **The market for cryptoassets has grown rapidly**

The market for cryptoassets has grown by around 150 per cent between 2018 and the middle of May 2022 (see Chart 27). There are around 10,000 different cryptoassets and their total market value was around SEK 12,700 billion (almost USD 1,300 billion) in the middle of May 2022. This is still only a fraction of the global financial system, for which the assets amounted to just under USD 470,000 billion at the end of 2020.<sup>105</sup>

The price of unbacked cryptoassets is based on expectations that someone else will be willing to pay at least as much as what they have paid for them. An important reason why the value of the market for cryptoassets has increased is that the price of unbacked cryptoassets has increased. Stablecoins have, however, over time become an increasingly larger part of the market for cryptoassets. In the middle of May, the market value of three of the largest stablecoins accounted for just over a tenth of the total market value of cryptoassets.<sup>106</sup> Unlike other cryptoassets, the increase in value is due to an increase in the number of stablecoins in circulation. This is a consequence of the fact that the price of stablecoins, at least in theory, should not fluctuate. As the number of stablecoins in circulation has increased, the reserves for these have also increased.

Many unbacked cryptoassets, such as Bitcoin and Ethereum, have market values that fluctuate substantially. This is very much in line with the developments that have taken place so far in 2022. A clear illustration of Bitcoins' volatility, for example, is that

<sup>104</sup> There are several types of stablecoins, such as algorithmic stablecoins that do not have a reserve of assets that fully corresponds to their value. Instead, the supply is controlled by an algorithm, thus keeping the value stable. For a more schematic overview of how different kinds of stablecoins are constructed, see, for example, D. Bullmann, J. Klemm and A. Pinna (2019), "In search for stability in crypto-assets: are stablecoins the solution?", *Occasional Paper Series*, No. 230, European Central Bank.

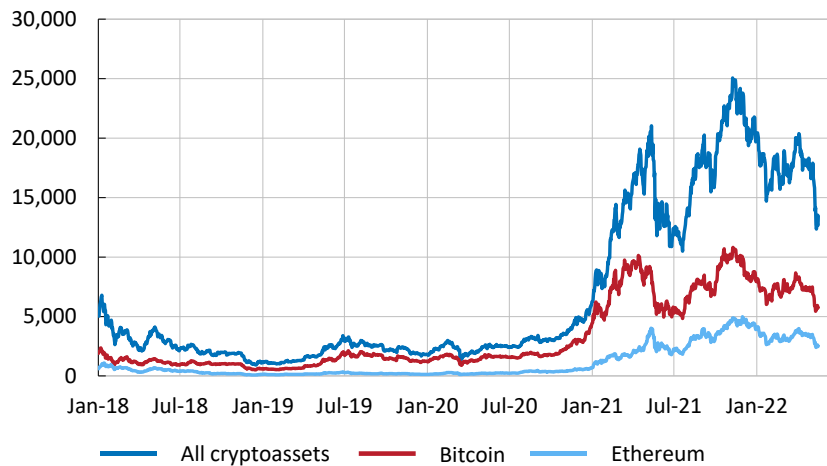
<sup>105</sup> See FSB (2021), "Global Monitoring Report on Non-Bank Financial Intermediation", December 2021, Financial Stability Board.

<sup>106</sup> See Chart A.20 in the Chart Appendix.

the price per Bitcoin on 17 May 2022 was just over SEK 300,000, while it was as much as around SEK 580,000 as recently as November 2021. Bitcoin and Ethereum have also had a significantly higher volatility than, for example, the S&P500 stock market index.<sup>107</sup>

**Chart 27. Market value of cryptoassets**

SEK billion



Source: Macrobond.

### Cryptoassets are energy-intensive

Several cryptoassets have over time become associated with high energy consumption. This is because the method they use to validate transactions and mine new cryptoassets (proof of work) requires considerable computer power.<sup>108</sup> Proof of work entails, in simplified terms, that so-called miners compete to solve a mathematical problem when a transaction is to be confirmed. The one who solves the problem the fastest will be rewarded with newly created cryptoassets. The higher the price of the cryptoassets, the more miners who want to compete for the newly created assets. As more miners compete to validate transactions, the problem becomes more difficult and requires more computer power to resolve it. This is why the energy consumption of Bitcoin, for example, has increased sharply in recent years. A clear example of the high energy consumption is that the Centre for Alternative Finance at Cambridge University estimates that the Bitcoin network has a higher energy consumption than Norway, for instance. A further comparison is that a Bitcoin transaction is estimated to require many thousands of times more energy than a card transaction with Visa or Mastercard.<sup>109</sup> Recently, some mining of cryptoassets has been established in northern

<sup>107</sup> See Chart A.21 in the Chart Appendix.

<sup>108</sup> See B. Segendorf (2014), "What is Bitcoin?" *Economic Review*, 2014:2, Sveriges Riksbank.

<sup>109</sup> See M. Laboure (2021), "The Future of Payments: Part II. When digital currencies become mainstream", February 2021, Deutsche Bank Research.

Sweden, and consumes as much electricity as that for 200,000 households on an annual basis.<sup>110</sup> As a result of the high energy consumption, FI and the Swedish Environmental Protection Agency have argued, among other things, that the proof-of-work method should be banned in the EU in favour of other, less energy-intensive methods and that Sweden should work to prevent the method from becoming even more established. The Riksbank agrees with these proposals.

## Cryptoassets have several areas of use

### **Cryptoassets are often used for speculation...**

To date, unbacked cryptoassets have primarily acted as speculative investments. A sign that cryptoassets are being used in this way, rather than as a means of payment, is that more than 50 per cent of the Bitcoin supply is held for a year or longer.<sup>111</sup>

The traditional way of investing in cryptoassets has been to buy the cryptoasset itself. In recent years, however, many different financial instruments have emerged that have cryptoassets as underlying assets, such as tracker certificates, which are a financial instrument that exactly follows the underlying asset. There are also options and various derivative products. There are also funds specifically targeted at cryptoassets and related activities. Some of these are Exchange Traded Funds (ETF). Investing in financial products with cryptoassets as underlying assets differs from investing directly in cryptoassets. This is because the markets where the instruments are traded are regulated, while the underlying cryptoassets are often not. However, issuers of these tracker certificates are not under the supervision of FI.

Some trading platforms allow a high leverage for these financial instruments. This means that you only have to invest a small amount of equity as collateral for your position and then you can borrow the rest. For example, if a person has SEK 100 in equity to invest and does not use leverage, the loss can at most be SEK 100, if the investment loses 100 per cent in value. If, on the other hand, you invest with leverage of tenfold, this means that the total investment will be SEK 1,000. In the event of a price change of 100 per cent, the profit or loss amounts to SEK 1,000, that is, more than the equity.

Various trading platforms for cryptoassets also offer other financial services, such as loans with cryptoassets as collateral.

The data available, for example, to authorities regarding cryptoassets is limited and there are few reporting requirements for operators who provide services related to

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<sup>110</sup> See debate article by E. Thedéen and B. Risinger (2021), 5 November, FI and the Swedish Environmental Protection Agency. [Crypto-assets are a threat to the climate transition – energy-intensive mining should be banned | Finansinspektionen.](#)

<sup>111</sup> See “Bitcoin: At the Tipping Point”, *Citi GPS: Global Perspectives & Solutions*, March 2021, Citibank.

cryptoassets. However, the data that is available suggests that it is mainly private individuals who have so far invested in cryptoassets.<sup>112</sup> As a global comparison, there are large holdings by private individuals in emerging market economies such as Vietnam, according to an index developed by the company Chainalysis.<sup>113</sup> In the United States, too, the holding is relatively large, while in Sweden it is considerably smaller. FI has also made a thematic review of the Swedish market for tracker certificates, and this showed that at most about 35,000 Swedes have invested in the certificates.<sup>114</sup> Banks' exposure to the market for cryptoassets is judged to be limited so far, both in Sweden and internationally.<sup>115</sup> At an international level, several traditional institutional investors have increased their exposure to cryptoassets in different ways, although these are still small exposures in relation to their total assets. Interest among institutional investors in Asia and Europe is particularly great.<sup>116</sup>

### **...and to a relatively small extent for payments**

In most countries, cryptoassets have generally rarely been used as a means of payment. In fact, cryptoassets, especially those that are unbacked, lack many of the characteristics that we associate with traditional means of payment – that they should be easy and quick to use and have a stable value. As a comparison, a transaction with, for example, Swish takes only a few seconds, while on average it takes about 10 minutes to complete a Bitcoin transaction. Prices are generally not set in Bitcoin, but in ordinary currency. Stablecoins have so far been used for the most part as a means of facilitating trade in other cryptoassets, rather than as a traditional means of payment.

Recently, the payment service providers Mastercard and Visa, among others, have initiated collaboration with several trading platforms for cryptoassets and have developed payment cards that enable payment with cryptoassets. When you make a purchase using these cards, the cryptoassets are exchanged into ordinary currency. The payment then goes through the usual card networks.<sup>117</sup> However, prices are still set in ordinary currencies. This could mean that in the future, cryptoassets will be used more frequently for payments.

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<sup>112</sup> A. Blandin et al. (2020), "3rd Global Cryptoasset Benchmarking Study", September 2020, Cambridge Centre for Alternative Finance.

<sup>113</sup> For more information, see Chainalysis (2021), "The 2021 Geography of Cryptocurrency Report: Analysis of Geographic Trends in Cryptocurrency Adoption and Usage", October 2021, Chainalysis.

<sup>114</sup> See "Financial instruments with cryptoassets as underlying assets", *FI supervision* No. 21, February 2021, Finansinspektionen.

<sup>115</sup> See consultation paper from the Bank for International Settlements, June 2021. [Prudential treatment of cryptoasset exposures \(bis.org\)](https://www.bis.org/prudential-treatment-of-cryptoasset-exposures).

<sup>116</sup> J. Neureuter (2021), "The Institutional Investor Digital Assets Study", September 2021, Fidelity Digital Assets.

<sup>117</sup> For more information, see *Payments Report*, 2021, Sveriges Riksbank.

## Cryptoassets can entail various types of risk

### Cryptoassets as a tool in illegal transactions

Several authorities have concerns about the use of cryptoassets for various types of criminal activity, such as money laundering or terrorist financing. In 2021, the total value of cryptoassets that can be linked to criminal activities is estimated at approximately USD 14 billion or 0.15 per cent of the total transaction volume of cryptoassets.<sup>118</sup> This largely concerns stolen cryptoassets and fraud.

To reduce these problems, the EU has taken the initiative of drawing up a regulatory framework aimed at increasing customer awareness (KYC) and preventing the use of cryptoassets for illegal transactions.<sup>119</sup> Authorities already have certain conditions for tracing transactions with cryptoassets that can be linked to criminal activities. This applies, for example, to the exchange of cryptoassets to different national currencies, as the traditional financial system is generally more regulated.

### Few links to the traditional financial system at present

So far, data suggest that it is mainly private individuals who have exposed themselves to cryptoassets, which means that any price fall primarily creates risks for the individual consumer. Consumer protection for most cryptoassets is also low, or non-existent, which makes it difficult for consumers to make claims in the event of problems arising.

If, for example, institutional investors, such as funds, were to have large exposures to cryptoassets that decline in value, they could find it difficult to fulfil other financial obligations. This is particularly true if the exposures have a high leverage. Such problems can spill over to other participants in the financial system, as well as other markets and types of assets. However, so far there are few links to the traditional financial system, although if they increase this could create risks to financial stability.

### Liquidity risks for stablecoins can spread to the traditional financial system

The term stablecoins may be misleading as they are not necessarily stable. Their stability can depend, among other things, on which assets the stablecoin's reserve consists of.<sup>120</sup> If the value is to be stable and it is to be redeemable without disruption, the reserve must be invested in assets that are both stable and liquid and have a size equivalent to the number of stablecoins issued, something that has not always been the case.

In May 2022, there were large sales of a relatively large stablecoin, TerraUSD, over a short period of time. Several factors are believed to have been behind this, and all in

<sup>118</sup> Chainalysis (2021), "The 2022 Crypto Crime Report", February 2022, Chainalysis.

<sup>119</sup> Regulation of the European Parliament and of the Council on the prevention of the use of the financial system for the purposes of money-laundering or terrorist financing, COM(2021) 420 final, July 2021.

<sup>120</sup> For further information, see FSB (2022), "Assessment of Risks to Financial Stability from Crypto-Assets", February 2022, Financial Stability Board.

all these have led to a fall in the value of TerraUSD of almost 90 per cent, from one dollar to around 13 cents. This shows how difficult it can be for stablecoins to maintain a stable value if they do not have a reserve of stable assets that fully corresponds to the number of stablecoins issued. In connection with the TerraUSD fall, USD Tether, for example, also had difficulty in maintaining its intended value of one dollar. Prices of other cryptoassets also fell.

In the autumn of 2021, a US authority sentenced the company responsible for the USD Tether stablecoin to a fine of USD 41 million, among other reasons for the claim that Tether was fully backed by assets in ordinary currency.<sup>121</sup> However, it turned out that the reserve's assets were not always sufficient to correspond to the number of stablecoins issued, and that the reserve included, among other things, various types of unsecured receivables. In addition, the reserve's assets had to some extent been held by unregulated operators or in other jurisdictions and had not been audited regularly. All in all, these factors could have led to USD Tether owners not being able to redeem them at the intended value of one dollar. As a comparison, the assets in the reserve for another stablecoin, USD Coin, according to their audit report, are fully denominated in US dollars held by regulated US financial institutions.

Depending on the assets in the stablecoins' reserve, there may also be a more direct link between the market for cryptoassets and the traditional financial system. If many holders of stablecoins want to redeem them at the same time, this may mean that the assets in the reserve will have to be sold off quickly. This may in turn lead to disturbances for example to the issuers of the assets that make up the reserve, which may also affect other participants in the financial system. The larger a stablecoin is, the greater the impact any sale of the reserve's assets may have on the financial system.

### **Cryptoassets have gained a larger role in some emerging markets**

The use of cryptoassets has been increasing, especially in some emerging market countries. This means that it is not impossible for cryptoassets, in whole or in part, to replace the ordinary currencies of these economies. This is often referred to as cryptoisation or digital dollarisation. This means, for example, that the consequences of large price falls in cryptoassets can spread more widely in these economies. If this happens, the central bank has little opportunity to implement measures and conduct monetary policy, because its tools are linked to the currency it issues. At present, the degree of cryptoisation in the world is small.<sup>122</sup>

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<sup>121</sup> See press release, "CFTC orders Tether and Bitfinex to Pay Fines Totaling \$42.5 Million", Commodity Futures Trading Commission, October 2021. Last updated 15 October 2021. Accessed 13 April 2022, [CFTC Orders Tether and Bitfinex to Pay Fines Totaling \\$42.5 Million | CFTC](#).

<sup>122</sup> See *BIS Quarterly Review*, March 2022, Bank for International Settlements.

## Cryptoassets are unregulated in many countries, but regulations are planned in several areas

Cryptoassets are mostly unregulated in many countries, including Sweden.<sup>123</sup> But regulations are being planned in several areas, for example in the United States and the EU.<sup>124</sup> However, some aspects of cryptoassets are regulated, for example, legislation aimed at preventing money laundering and terrorist financing may often include cryptoassets.<sup>125</sup> Some countries, such as China, have banned cryptoassets and related activities. However, this can lead to the activities moving to other countries with more lenient legislation, which has already happened to some extent.

As cryptoassets are often unregulated, there is a risk that issuers of cryptoassets and service providers will circumvent regulation in other areas, by providing similar services but with the new technology. This is commonly referred to as ‘regulatory arbitrage’. One example of this is that some stablecoins have a reserve that largely consists of short-term assets such as commercial paper, similar to money market funds, for example.<sup>126</sup> However, these stablecoins do not meet the same requirements as money market funds do. It is also possible to argue that stablecoins conduct banking-like activities, while not complying with the requirements of the banking regulations. To avoid regulatory arbitrage, it is necessary for similar types of financial activities to be subject to the same requirements, regardless of the operator. This can then form the basis for how different agents are regulated so that the risks they give rise to can be managed.

In addition to the various regulatory initiatives that have been taken, work is also being carried out on a broad front within several international standard-setting bodies such as the Committee on Payments and Market Infrastructures (CPMI), the International Organization of Securities Commissions (IOSCO), the Financial Stability Board (FSB) and the Basel Committee on Banking Supervision (BCBS).<sup>127</sup> Their work covers various aspects linked to cryptoassets and providers of such services. Among other things, it focuses on the development of standards that allow the risks associated with them to be adequately addressed.

<sup>123</sup> See *Regulation of Cryptocurrency Around the World: November 2021 Update*, November 2021, Global Legal Research Directorate.

<sup>124</sup> For more information on US regulation, see for example the press release “President’s Working Group on Financial Markets Releases Report and Recommendations on Stablecoins”, November 2021, U.S. Department of the Treasury. Last updated 1 November 2021. Accessed 4 March 2022, [President’s Working Group on Financial Markets Releases Report and Recommendations on Stablecoins | U.S. Department of the Treasury](#).

<sup>125</sup> See, for example, Proposal for a regulation of the European Parliament and of the Council on the prevention of the use of the financial system for the purposes of money-laundering or terrorist financing, COM(2021) 420 final, July 2021.

<sup>126</sup> See Chart A.22 in the Chart Appendix.

<sup>127</sup> For example, see CPMI-IOSCO (2021), “Application of the Principles for Financial Market Infrastructures to stablecoin arrangements”, October 2021, Bank for International Settlements, FSB (2021), “Regulation, supervision and oversight of ‘global stablecoin’ arrangements: Progress report on the implementation of the FSB high-level recommendations”, October 2021, Financial Stability Board and the consultation paper from the Bank for International Settlements, June 2021. [Prudential treatment of cryptoasset exposures \(bis.org\)](#).



## Future regulation of cryptoassets and service providers in the EU

Work is currently under way in the EU on a new regulation on cryptoassets, the so-called Markets in Crypto-Assets (MiCA), which was proposed by the European Commission in September 2020. This regulation focuses, among other things, on consumer and investor protection. MiCA is intended to impose requirements on both issuers of cryptoassets and providers of cryptoasset services, such as trading platforms. The European Commission has proposed that issuers of stablecoins should be authorised by the competent authority in their home country and that, among other things, the issuer should be required to have good governance and control and an available reserve of assets. It is proposed that reserve assets may be invested only in highly liquid financial instruments with minimal market and credit risk.

Additional requirements are proposed for stablecoins considered to be “of significant size”. They concern, for example, that issuers are to monitor their liquidity needs, including by having a liquidity management policy, to be able to meet the requirements for redemption of stablecoins.

## Limited Swedish stability risks at present

The market for cryptoassets has grown substantially in a short time, but is still relatively small. Overall, the risk that shocks in the market for cryptoassets will threaten financial stability in Sweden is currently considered to be limited. The IMF has made a similar assessment for the global financial system.<sup>128</sup> However, cryptoassets may threaten financial stability if, for example, the exposure of banks and institutional investors increases.<sup>129</sup> There is also a link between the reserve assets for stablecoins and the financial system, which can lead to greater risks as stablecoins grow. The proposed MiCA Regulation is a step in the right direction, above all, to increased consumer protection and control over cryptoasset service providers. Reporting requirements for the agents that will comply with the MiCA Regulation would improve the ability to monitor developments in this field.

However, there is a risk that the MiCA Regulation will not be sufficient, partly because activities linked to cryptoassets are largely cross-border. This underlines the importance of international cooperation. Cryptoassets have been a prioritised area in many international forums in recent years and it is important that this work continues going forward. The Riksbank is continuing to monitor developments in this field and is involved in the work of standard-setting bodies.

## Continued work on a Swedish digital central bank currency – the e-krona

In addition to the work regarding cryptoassets in many standard-setting bodies, the Riksbank is investigating whether it is possible to issue a digital complement to cash, a so-called e-krona. One reason for the Riksbank’s work on the e-krona is that cash is

<sup>128</sup> See the chapter “The Crypto Ecosystem and Financial Stability Challenges” in *the Global Financial Stability Report*, October 2021, International Monetary Fund.

<sup>129</sup> See, for instance, FSB (2022), “Assessment of Risks to Financial Stability from Crypto-Assets”, February 2022, Financial Stability Board.

being used less and less often in Sweden. The e-krona would be what in the international discussion is known as a “Central Bank Digital Currency” (CBDC). CBDCs can be similar to cryptoassets through their digital format. However, they differ from these, for example, in that they are issued by a central bank and appear as a liability on the central bank’s balance sheet. A CBDC is not a new currency, but is expressed in the national currency and should therefore be usable in the same way. This also means that the e-krona, in the same way as the ordinary Swedish krona, benefits from the underlying confidence that the Swedish economy and the Swedish financial system are stable, with well-managed institutions. In addition, the e-krona would be covered by the Riksbank’s statutory obligation to maintain price stability. There is no similar underlying trust for cryptoassets. This is also an explanation of the major price changes that characterise a large part of the market for cryptoassets.

Since 2020, the Riksbank has entered a more practical phase of the e-krona project in order, among other things, to examine various technical aspects of the e-krona.<sup>130</sup> However, no decision has yet been taken as to whether an e-krona should be issued.

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<sup>130</sup> For more information, see, for example, the report “E-krona Pilot Stage 2”, *E-krona Report*, April 2022, Sveriges Riksbank.