Box A

Financial Stability Risks from Crypto-assets

There are multiple types of crypto-assets

'Crypto-asset' is a broad term used to describe private sector digital assets that depend primarily on cryptography and distributed ledger technology.[1] This Box focuses on unbacked crypto-assets and asset-backed stablecoins. **Unbacked crypto-assets** – such as Bitcoin and Ether – are so called because their value is not derived from a reserve of other financial assets. They often have very few use cases and derive most or all of their value from investors' speculation about future capital appreciation, which leaves them vulnerable to significant price volatility.

Stablecoins are crypto-assets that aim to minimise price volatility against another asset or a basket of assets – commonly a fiat currency (e.g. the US dollar) or a common store of value (e.g. gold). **Asset-backed stablecoins** maintain a reserve of financial assets that can be sold in order to meet redemption requests at 'par' (e.g. 1 Tether = 1 US dollar); however, for some stablecoins, these redemptions are not legally guaranteed and are subject to fees and restrictions.[2] Asset-backed stablecoins are distinct from **algorithmic stablecoins**, which aim to maintain a peg against a financial asset price through various types of algorithms and incentive mechanisms tied to unbacked crypto-assets. Similar to other unbacked crypto-assets, algorithmic stablecoins are inherently fragile as the stability of the peg depends primarily on investors' confidence in the value of the underlying unbacked crypto-asset.

Stablecoins play an important role in the systems underpinning the trading and use of crypto-assets (the 'crypto ecosystem'). They are commonly used as a 'bridge' between traditional currency and other crypto-assets, or between different crypto-assets, as well as a safer store of value in the crypto ecosystem. More than 75 per cent of trading on crypto trading platforms in 2022 so far has involved a stablecoin.[3]

Authorities in Australia and overseas are in the process of developing regulatory frameworks for stablecoins and other crypto-assets, in recognition of their potential to become systemically important in the future. A particular focus is '**payment stablecoins**' – a subset of asset-backed stablecoins with features that are specifically designed to facilitate their widespread use as a means of payment. This includes being fully backed by high-quality assets and the ability (or implied promise) for customers to be able to withdraw their funds on demand in fiat currency (similar to traditional financial products such as bank deposits or stored-value facilities).

The global crypto-asset market is small relative to other assets but has grown rapidly

The total value of crypto-assets is small relative to other asset markets such as equities; the market capitalisation of all crypto-assets is currently around US$950 billion, equivalent to around 2.5 per cent of the US equity market. However, the crypto-asset market has grown rapidly in value and complexity over recent

Table A1: Risks to Crypto-asset Investors

	Asset-backed stablecoins	Unbacked crypto-assets
Market and liquidity risks	Redemption is not guaranteed due to the possibility of a 'run' (rapid withdrawal of funds with redemption compromised by illiquidity of assets). Reserves are subject to market, credit and liquidity risks.	Highly volatile and susceptible to runs because they derive all, or almost all, of their value from investors' expectations of future capital appreciation. Losses could potentially be amplified because exchanges allow for high leverage.
Operational risks, including cyber-attacks and fraud	High risks due to opacity and reliance on unregulated service providers. Cyber-attacks on individuals or service providers are prevalent. There is minimal recourse for stolen or lost crypto-assets. Fraud and market manipulation are common. Issues for consumer protection and market integrity.	

Source: RBA

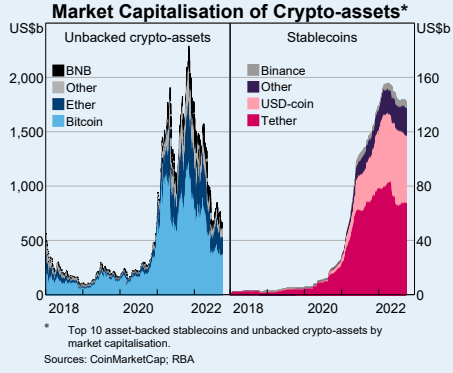
years, and has attracted increasing interest from mainstream financial institutions. Crypto-assets are also actively traded – trading values for the largest crypto-assets reached a peak of more than US$2.2 trillion in May 2021, similar to the values traded on the Nasdaq exchange at that time.[4] There are more than 16,000 crypto-assets in existence, although market capitalisation is heavily concentrated among a small number of larger crypto-assets (Graph A.1). As in many other economies, crypto-related activity has grown in Australia over recent years, although interconnections between the Australian financial system and crypto-assets remain small (see 'Chapter 3: The Australian Financial System').

Crypto-assets present significant risks to investors

Participants in crypto markets face a high level of market, liquidity and operational risks (Table A.1). These risks are exacerbated by the highly interconnected nature of the market and its sensitivity to changes in risk sentiment. Crypto-asset prices fell sharply in early 2022 alongside increases in interest rates; these falls contributed to the failure of several major crypto projects (see 'Chapter 1: The Global Financial Environment').

Less-sophisticated retail participants may be particularly vulnerable to risks from crypto investments, owing to weaker security practices, less awareness of potential risks, and exposure to price manipulation by larger investors. Recent survey data indicate that retail investment remains too small to pose

Graph A.1



issues for financial stability, although it has become much more widespread in the past couple of years. Survey data suggests around 10 per cent of households in the euro area hold crypto-assets (although most investors hold less than €5,000) and an estimated 12 per cent of US households hold or have used crypto-assets.[5] More widespread retail investment could result in stronger real economy linkages in the future – for example, if movements in crypto-asset prices were to affect aggregate consumption through confidence and wealth effects. Highly leveraged retail investors could also pose financial stability risks if crypto investment were to become more widespread in the future.

Growing linkages between the crypto ecosystem and the traditional financial system could see risks spill over

Linkages between crypto-assets and traditional financial markets remain small. As a result, the recent episode of stress in crypto-asset markets did not spill over to affect other parts of the financial system. Nevertheless, linkages have grown in recent years due to greater involvement from institutional investors, banks and other financial institutions. The rapid growth of asset-backed stablecoins has also introduced direct linkages between crypto-assets and financial asset markets. Continued growth and stronger linkages could see financial stability risks arise from a number of sources in the future. Work is underway by policy-makers to consider what adjustments are needed to current regulatory frameworks to enable effective oversight of the risks presented by crypto-asset-related activities.

Fire sales of stablecoin reserves could cause dysfunction in funding markets

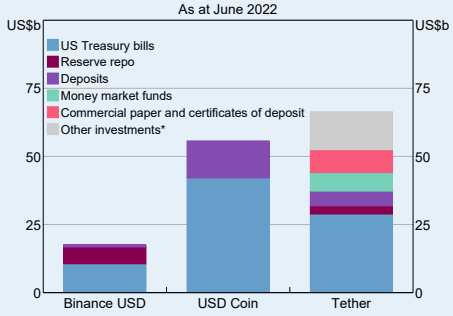
Asset-backed stablecoins are backed by financial assets, including short-term debt such as US Treasury bills and commercial paper. A run on a stablecoin – triggered by, for example, a price fall, rumours of instability or concerns about underlying asset quality – could impair the functioning of short-term funding markets if it resulted in large asset sales. Runs on money market funds (MMFs), which invest in similar assets to stablecoins, have contributed to disruptions in commercial paper markets in the past during periods of market-wide stress (including in 2008 and 2020). Relative to MMFs, some stablecoins are much more susceptible to runs because of their opacity and the lower quality of their reserve holdings – for example, Tether, the largest stablecoin, currently invests a portion of its reserves in higher yielding risky assets (Graph A.2).

At present, the stablecoin market does not yet seem large enough for a run to generate major disruptions in funding markets. The three largest stablecoins (which are all pegged to the US dollar) are comparable in size to some US MMFs, although the total value of stablecoins on issue is much smaller

Graph A.2

Stablecoin Reserves

As at June 2022



* Includes secured loans, corporate bonds, investment funds, precious metals, crypto-assets and non-US government debt securities.

Source: Stablecoin issuer disclosures

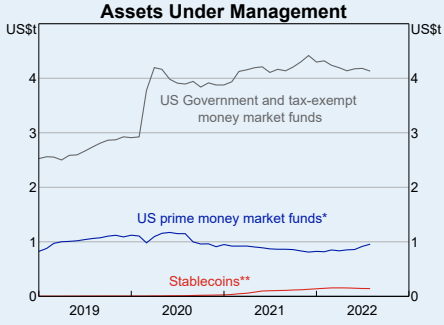
than the US MMF market (Graph A.3). Recent disclosures by these stablecoins also indicate that total holdings of reserve assets are small relative to measures of market depth. For example, Tether's disclosed holdings of commercial paper in June 2022 accounted for less than 1 per cent of total supply outstanding and less than 10 per cent of average daily issuance. The total stock of US Treasury bills held by the three largest stablecoins in June 2022 was around US$80 billion, while the average daily turnover in that market is more than US$140 billion.

In contrast to asset-backed stablecoins, unbacked crypto-assets have minimal direct links with traditional asset markets. Nevertheless, the returns and price volatility of unbacked crypto-assets have become more correlated with traditional 'risk assets' such as equities since the start of the pandemic when interest rates declined to historically low levels (Graph A.4). This likely reflects the fact that a wider range of retail and institutional investors now include crypto-assets in investment portfolios and are buying and selling crypto-assets in response to broad market-wide developments that also affect other risky assets. While their trading volumes may be large, the relatively small size of crypto-assets means spillovers from crypto-assets to financial markets such as equities are likely to be similarly small in aggregate. However, spillovers could increase if the crypto market were to grow significantly, particularly if crypto-assets were to become more actively traded by banks and other financial institutions. For example, volatility in crypto-assets that triggers margin calls could generate widespread liquidity pressures and force liquidation of traditional assets.

Banks face both direct and indirect exposures to crypto-assets

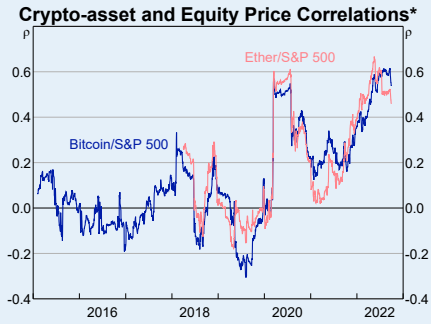
Advanced economy banks' exposures to crypto-assets are very small at present, limiting financial stability risks. Global data collected by the Basel Committee on Banking Supervision indicated that in 2020 only a handful of internationally active banks reported having any cryptocurrency exposures, with the average exposure amounting to less than 0.02 per cent of their risk-weighted assets.[6] More recent information from overseas authorities indicates that banks have been increasingly willing to provide crypto-related services and

Graph A.3



* Prime money market funds primarily invest in corporate debt securities.
** Market capitalisation; predominantly US dollar stablecoins.
Sources: CoinMarketCap; RBA; US Office of Financial Research

Graph A.4



* 100 day rolling correlation between daily returns on unbacked crypto-assets and the S&P 500.
Sources: CoinMarketCap; RBA

integrate crypto-assets into pre-existing services; however, the volumes and exposures involved remain small.[7]

Banks face several risks associated with their involvement with crypto-assets, including the following:

- Banks that have direct exposures to crypto-assets, including through derivatives, face the same market, liquidity and operational risks as other investors. These risks are greatest if a bank invests in these assets directly, but they also arise if banks accept crypto-assets as collateral.
- Banks may perform broking, trading or other services that involve little market exposure but carry legal and reputational risks – for example, due to rules related to anti-money laundering and counter-terrorism financing or if customers make large losses on crypto investments facilitated by the bank.
- Banks have begun issuing their own stablecoins in experimental settings, and issuance could become more widespread in the future. This could have implications for the issuing bank's liquidity management and operational resilience, as well as for customers and payment systems, depending on factors such as the intended use case and the scale of the issuance.

Institutional investors could face large losses

Institutional investment in crypto-assets increases links between the crypto ecosystem and the traditional financial system. For example, portfolio rebalancing by large investors is likely to increase correlations between the prices of crypto-assets and some other financial assets, increasing the likelihood that a shock to crypto-assets affects the prices of other assets.

Institutional investors' crypto-asset exposures are currently not large enough to constitute financial stability risks, but they have been increasing. Global survey data from 2022 suggests around one-third of surveyed funds held digital assets in their investment portfolios (up from around one-fifth in 2021), although crypto-assets comprised only 4 per cent of total assets under management on average.[8]

More widespread use of crypto-assets for payments could generate risks for customers and merchants

At present, crypto-assets are not widely used for payments outside of the crypto ecosystem, and they are currently unsuitable for mainstream payments due to: high fees; capacity and speed constraints imposed by the underlying technology; and volatility (in the case of unbacked crypto-assets). However, there is considerable interest globally in the potential for stablecoins to enhance the efficiency of a range of payment and other financial services.

More widespread use of crypto-assets for payments would generate similar risks for customers and merchants as other payment systems (e.g. credit, liquidity, operational and settlement risks). The extent to which these issues pose risks for financial stability would depend on the scale and nature of the system; however, in an extreme case it could have the potential to disrupt critical financial services or threaten confidence in financial institutions. Regulators in Australia and overseas are attentive to these risks and are in the process of developing regulatory

frameworks that would apply to crypto-assets, with payment stablecoins being a particular focus.

Crypto-asset technologies are highly energy intensive

Some crypto-asset technologies – particularly 'proof of work' systems – require significant amounts of energy and therefore contribute to climate change, which itself poses risks to financial stability. Crypto-assets are estimated to contribute around 0.4–0.9 per cent to annual global energy usage; for comparison, the upper end of this range exceeds the total annual energy usage of Australia.[9] Consumption increases over time, as competition for crypto-asset rewards encourages 'miners' verifying transactions to upgrade to faster, more energy-intensive computers. The high energy intensity of proof-of-work technologies has prompted a shift towards lower intensity technologies over recent years, such as Ethereum's transition to a 'proof of stake' system in September 2022.[10]

Work is being undertaken to better regulate crypto markets

Financial stability risks from crypto-assets remain small, but risks could escalate quickly if the crypto ecosystem grows and becomes more strongly interconnected with the traditional financial system. Central banks, domestic authorities and international bodies are undertaking significant work to understand the financial stability risks stemming from the crypto ecosystem and the need for regulatory adjustments. This work has focused on identifying both the gaps in existing supervisory and regulatory frameworks and the infrastructure required to build resilience against risks. Greater regulatory certainty around the treatment of crypto-assets will also help to encourage innovation that could improve competition and efficiency in areas such as payments.

International regulatory bodies are currently consulting on the prudential treatment of banks' crypto-asset exposures and have issued guidance on the application of the Principles for Financial Market Infrastructures to stablecoin arrangements.[11] In addition, regulators are working to improve consumer protections around crypto-assets, including by targeting misleading or fraudulent advertising by crypto market operators such as exchanges and lending platforms. Most jurisdictions are consulting on, or are in the process of developing, domestic regulation – including Australia. Furthermore, regulators are working to ensure compliance of crypto activities with existing legislation. One focus is on identifying the extent to which crypto-assets and intermediaries share common features with the traditional financial system, with the goal of producing 'technology neutral' regulation (i.e. same activity, same risk, same regulation). For example, Australian regulators are exploring options for incorporating payment stablecoins into the proposed regulatory framework for stored-value facilities, reflecting their similar risks (see 'Chapter 4: Domestic Regulatory Developments').

Endnotes

[1] Dark C, D Emery, J Ma and C Noone (2019), 'Cryptocurrency: Ten Years On', RBA *Bulletin*, June.

[2] For example, the minimum withdrawal from Tether is US$100,000 and incurs US$1,000 in fees. Tether, 'Fees'. Available at <https://tether.to/en/fees/>.

[3] The Block (2022), 'Share of Trade Volume by Pair Denomination', October. Available at <https://www.theblock.co/data/crypto-markets/spot/share-of-trade-volume-by-pair-denomination>.

[4] Hermans L, A Ianiro, U Kochanska, V-M Törmälehto, A van der Kraaij and JM Vendrell Simón (2022), 'Decrypting Financial Stability Risks in Crypto-asset Markets', ECB *Financial Stability Review*, May.

[5] Hermans *et al*, n 4; Board of Governors of the Federal Reserve System (2022), 'Economic Well-being of U.S. Households in 2021', May.

[6] Auer R, M Farag, U Lewrick, L Orazem and M Zoss (2022), 'Banking in the Shadow of Bitcoin? The Institutional Adoption of Cryptocurrencies', BIS Working Paper No 1013, May.

[7] See, for example, Hermans *et al*, n 4; Financial Policy Committee (2022), 'Financial Stability in Focus: Cryptoassets and Decentralised Finance', Bank of England, March.

[8] Alternative Investment Management Association (2022), '4th Annual Global Crypto Hedge Fund Report', June.

[9] The White House, 'Fact Sheet: Climate and Energy Implications of Crypto-Assets in the United States', Press Release, 8 September.

[10] Ethereum (2022), 'The Merge'. Available at <https://ethereum.org/en/upgrades/merge/>.

[11] Committee on Payments and Market Infrastructures and International Organization of Securities Commissions (2022), 'CPMI and IOSCO Publish Guidance, Call for Comments on Stablecoin Arrangements', BIS Press Release, 6 October; Basel Committee on Banking Supervision (2022), 'Basel Committee Publishes Second Consultation Document on the Prudential Treatment of Banks' Cryptoasset Exposures', BIS Press Release, 30 June.