December 2022

Cryptocurrency Special Report

Part 1: Currency in Name Only

Summary

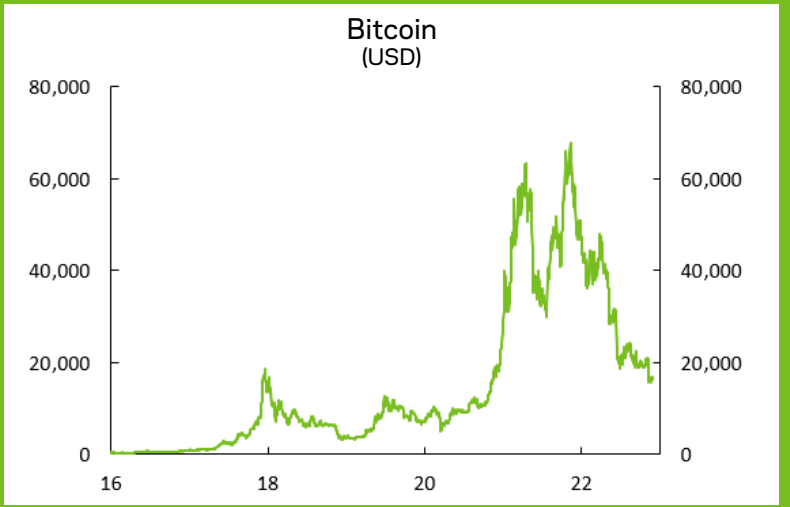
- Cryptocurrencies have generated considerable attention since the creation of Bitcoin in 2009. The space is back in the limelight at present, but for the wrong reasons.

- Implicit in the name is that cryptocurrencies should function as a form of private money. Money has three key characteristics: medium of exchange, store of value, and unit of account.

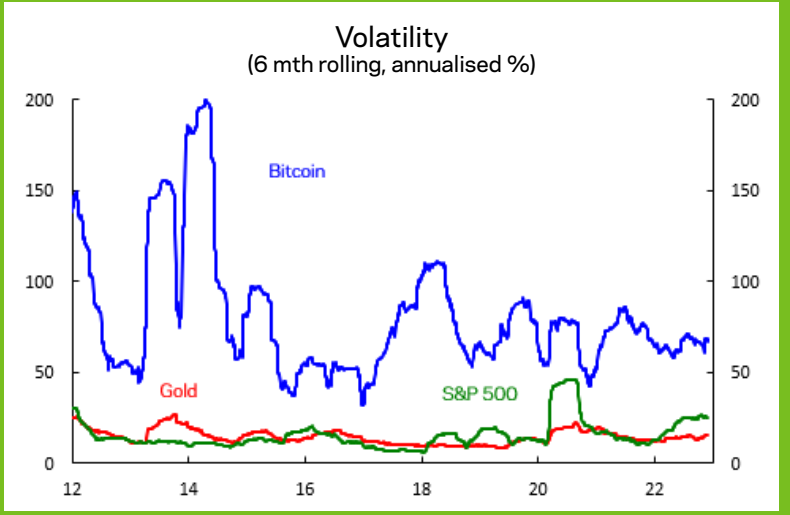
- While some businesses accept cryptocurrencies, their use is extremely limited. So far, cryptocurrencies are an inefficient and expensive payment method. Bitcoin and other cryptocurrencies have exhibited extreme volatility, both in an absolute sense and relative to other assets. Extreme volatility makes cryptocurrencies a poor store of value.

- Cryptocurrencies are not used as a unit of account in Australia or internationally. Businesses that accept cryptocurrencies still typically price their goods and services in fiat currency.

- Despite the name, cryptocurrencies, in their current form and use, do not adequately exhibit any of the three characteristics of money. However, technological innovation is moving quickly, and a range of advances and disruptions may stem from the field.



Source: Bloomberg



Source: Bloomberg

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Introduction

Cryptocurrencies have generated considerable attention since the creation of Bitcoin in January 2009.

Since the birth of Bitcoin, cryptocurrencies have experienced multiple episodes of surging prices, followed by major crashes. Over 10,000 cryptocurrencies currently exist and many more have come and gone. Scams have proliferated the space, as have concerns surrounding the use of cryptocurrencies to facilitate crime, money laundering, and the enormous environmental impact of mining operations.

The space was again thrust into the limelight throughout 2021 and 2022 as the prices of many cryptocurrencies soared, before coming crashing back down. Several companies collapsed. This included the very rapid and high profile bankruptcy of one of the largest cryptocurrency exchanges, FTX.

But putting aside the controversy for a moment, why should we care?

For most people two key questions are:
1. Will cryptocurrencies be used as a mainstream form of payment in the future?
2. Are there potential uses for cryptocurrencies in investment portfolios and what might they be?

What are Cryptocurrencies?

Cryptocurrencies are forms of digital tokens that are secured using cryptography.

They provide users with the ability to transfer ownership of tokens between different 'wallets' in a secure way, without the need for a central counterparty. The cryptographic technology underlying cryptocurrencies ensures that individual tokens can only be transferred to one wallet at a time. This addresses potential issues around tokens being sent to multiple wallets at once (i.e. the double spend problem) or tokens being counterfeited.

Cryptocurrencies use a form of distributed ledger technology known as blockchain. In simple terms, a blockchain is like an append-only database or a log of transactions. Data is stored in 'blocks' which are cryptographically linked to one another using digital signatures known as hashes. This ensures that every block has a fixed relationship with the blocks that came before it, maintaining the security of the blockchain.

Additionally, the underlying data (i.e. the blockchain itself) is not stored in a centralised location. Rather, it is stored on a distributed public ledger across computers on a network (known as nodes). Validator nodes, a special kind of node, hold a record of the entire blockchain and validate whether incoming transactions are legitimate or not. Once transactions are validated, validator nodes add them to the end of the blockchain and are rewarded with newly minted cryptocurrency.

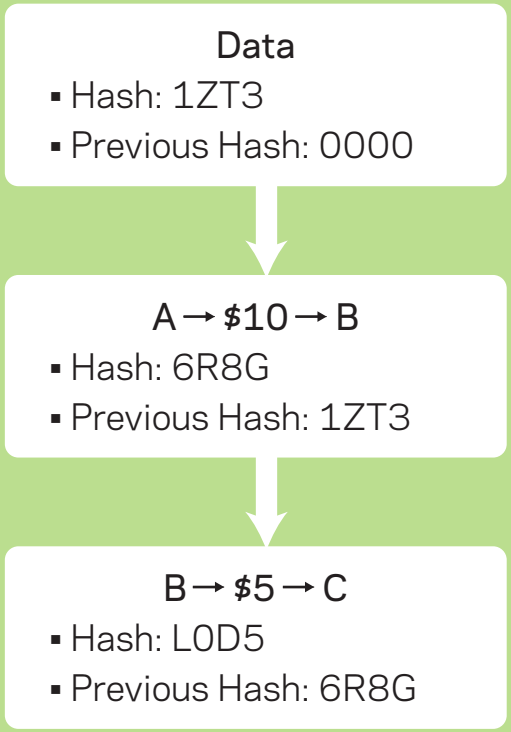
Early blockchains (e.g. Bitcoin) log transactions transferring tokens from one wallet to another. New generation blockchains (e.g. Ethereum) can store transactions, in addition to other data (e.g. URLs), and small bits of computer code, known as 'smart contracts'. Smart contracts enable simple programs to be encoded on the blockchain, which do not need a central counterparty to be executed.

The development of smart contracts is one of the key building blocks of decentralised finance (DeFi) applications.

Potential Uses

Many potential uses have been proposed for blockchain technology and cryptocurrencies, from supply chain management solutions to the digitisation of asset ownership. However, the main proposed uses of cryptocurrencies today remain as an investment or as a form of payment.

Figure 1: Defining Blockchain



Are Cryptocurrencies Money?

Implicit in the name is the suggestion that cryptocurrencies should function as a form of private money.

In thinking about this, it is important to consider what are the main characteristics of traditional 'money' and whether Bitcoin, or other cryptocurrencies, exhibit these characteristics.

The use of cryptocurrencies as a form of private money is appealing to some users. Proponents often note the potential for cryptocurrencies to provide a decentralised, and typically unregulated, form of payment and transfer of value from one party to another. This may be useful in cases where people do not have faith or trust in a central counterparty to facilitate transactions and maintain the purchasing power of a currency.

Proponents often also note the potential for cryptocurrency payments to be cheaper than existing forms of payment, including potentially providing a cheaper solution to sending money across borders (e.g. remittances).

However, do these statements stack up and can cryptocurrencies be considered money in their current form?

Hint: it doesn't look like you'll be paying for your groceries with cryptocurrencies any time soon…

Money has taken many forms over time and evolved over thousands of years, from barter trading, to cowry shells, gold coins, paper money, and electronic money.

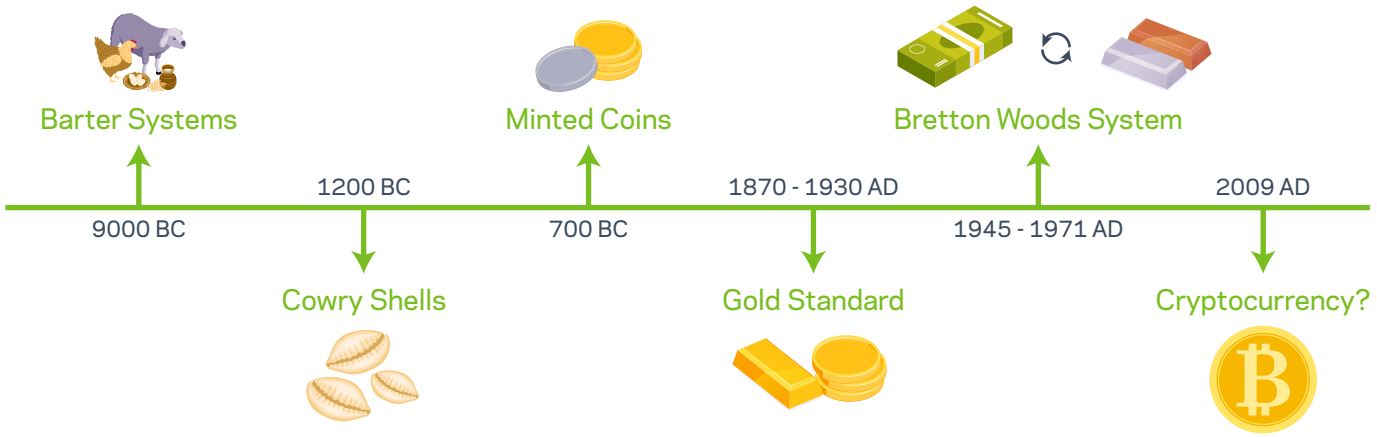
Private money issued has also existed in the past. In the United States, around 8,000 different types of private money were issued by banks, states, municipalities, companies and other organisation by 1860.

However, issuer failures were common, resulting in the money becoming worthless. The National Banking Acts of 1863 and 1864 facilitated the creation of a national currency in the US and an end to privately issued forms of money.

While money has taken numerous forms over time, the different forms of money have exhibited three key characteristics; 1. Medium of exchange, 2. Store of value and 3. Unit of account.

Fiat currencies issued by central banks (the predominant form of money today) exhibits these characteristics, either within a local economy or across the globe (e.g. the US dollar continues to be the dominant currency used to facilitate global trade). Domestically, the Australian dollar is issued by the Reserve Bank of Australia (RBA) and is legal tender across the country, being utilised as the primary medium of exchange in the country.

Figure 2: History of Money



Medium of Exchange

The payments landscape has undergone a huge transformation over recent decades.

The use of electronic forms of payment has continued to grow, while the use of non-electronic mediums, including cash and cheques, has steadily declined. However, while there is a lot of noise around cryptocurrencies, they currently only account for a very small share of global payments.

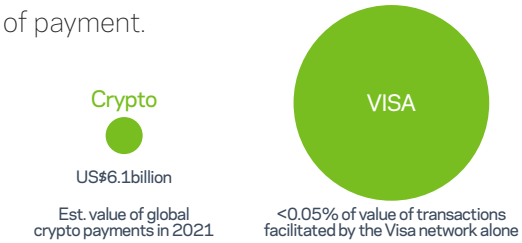
In its 2022 Payments System Board Annual Report, the RBA reported that the number of card purchases grew by an average of around 11% per year over the past decade to 2021-22, while the value of transactions grew by an average of around 7% over the same period. In contrast, the use of cheques declined by almost 20% per year, on average over the same period. Cash use has also consistently declined, accounting for around 27% of the number of consumer payments in 2019, versus around 70% in 2007.

The value of credit and debit card payments grew by 9% in 2021-22, to $710 billion.

Payment Methods					
Cash (notes & coins)	**Credit & debt cards**	**Electronic transfers** (Osko)	**Other Electronic transfers** (BPay, Paypal)	**Mobile Payments** (Apple / Google pay)	**Cheques**

Globally, the Visa network represents a significant piece of infrastructure of the payments system. The network facilitated ~US$13 trillion of transactions over the 12 months to Sep 2021.

In contrast, cryptocurrencies are not readily accepted by most businesses and are not commonly used to facilitate economic transactions. While some businesses accept Bitcoin or other cryptocurrencies to pay for goods and services, the use of cryptocurrencies for payments is extremely limited. It's difficult to know the exact value of cryptocurrency transactions, however, it is estimated to be extremely small relative to other common forms of payment.



The value of transactions facilitated by cryptocurrencies is also a fraction of the total daily trading volume of cryptocurrencies. This suggests that cryptocurrency transactions are primarily undertaken for reasons other than to be used as a medium of exchange, such as speculation.

Medium of Exchange

Another key consideration for whether a form of payment can be effectively utilised as a medium of exchange is how efficient that form of payment is in transferring value from one party to another. For electronic forms of payment, this is often assessed by considering how many transactions can be executed per second and the cost of those transactions.

The cost of processing crypto transactions can be prohibitive. For example, transactions on the Ethereum network incur a transaction fee, known as 'gas'. These gas fees have averaged between a few dollars to more than US$60 over the past 12 months for a single transaction, with occasional spikes even higher. This makes the use of the Ethereum network extremely prohibitive for anything other than large transactions. Additionally, at times of network congestion, 'gas wars' can emerge, where participations bid up the price of gas, in some cases beyond US$1,000, to have their transaction processed ahead of others.

In contrast, in Australia, transaction fees for eftpos and debit cards are exceptionally low, typically below 0.5% of the value of the transaction. Transaction fees for credit cards are generally below 1% and up to around 1.5% for premium cards.

The slow processing ability and prohibitive transaction fees mean that using a cryptocurrency, such as Bitcoin or Ethereum, is not practical for day-to-day transactions. Therefore, cryptocurrencies do not currently function as a means of exchange in a meaningful global or domestic capacity, and it is unclear whether these issues will be fully resolved in the future.

Network	Average transaction per second
Visa & Mastercard	1,700 - 5,000 (up to 24,000 at peak)
Bitcoin	7
Ethereum	20

Store of Value

Currencies can only be an effective store of value if their price remains relatively stable in the near term and does not experience large increases or decreases in value. In other words, its price is expected to exhibit relatively low volatility.

Volatile inflation can change the value of a currency by altering its real purchasing power – that is the rate it can be exchanged at for goods and services. Central banks around the global have generally been able to keep inflation low and stable, making fiat currencies an effective store of value.

The value of a currency can also change relative to another currency. The volatility of the Australian dollar has typically remained low. By contrast, Bitcoin and other cryptocurrencies have exhibited extreme volatility, both in an absolute sense and relative to other asset classes, such as the S&P 500, US Treasury bonds, gold, and the Australian dollar.

	Australian Dollar	Bitcoin
Volatility against US Dollar[1]	6% - 15%	40% - 85%
Share of daily movements between -1% & +1%[2]	90%	35% - 40%

1. Range of annualised 6-month rolling volatility since March 2020.

2. Since January 2016

Unit of Account

The final key characteristic of money is that it acts as a unit of account. This means that the value of goods and services provided by businesses in an economy are measured in terms of the money used in that economy. For example, goods and services in Australia are measured in Australian dollars. Goods and services that are traded across borders are typically measured in US dollars, which remains the key currency for international commerce (e.g. commodity prices are typically measured in US dollars).

Cryptocurrencies are not used as a unit of account in Australia or internationally. For example, businesses that accept Bitcoin or other cryptocurrencies as payment typically price their goods and services in US dollars, or a representative local currency, and accept the equivalent value in cryptocurrency based on the prevailing exchange rate at the time.

Currently, two countries have recognised Bitcoin as legal tender within their economies. El Salvador was the first to make Bitcoin legal tender, in June 2021, followed by the Central African Republic in April 2022. Despite Bitcoin being legal tender in El Salvador for over 12 months, it is not widely used as a medium of exchange or unit of account.

What does the Future hold?

Despite the name, cryptocurrencies, in their current form and use, do not adequately exhibit the three characteristics of money.

A range of private forms of money have existed in the past and have failed for various reasons. The current cryptocurrency landscape suffers from a range of significant technological, reputational, environmental, and regulatory challenges that restrict the adoption and use of digital currencies beyond limited use cases. The current episode of instability has also significantly impacted confidence.

However, technological innovation is moving quickly and a range of advances and disruptions may stem from the field. Stay tuned for Part 2 for information on new innovations that may help to address some of these issues.

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