UNIVERSITY of NICOSIA

MSc in Digital Currency

DFIN-511: Introduction to Digital Currencies

Session 1
A brief history of money

DFIN-511: Introduction to Digital Currencies

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Objectives of Session 1

- The history of currency and money could fill a full course or even a degree program. In this first session, we will attempt to cover it in one class session. Given this, by necessity, we will need to make significant simplifications and cover stretches of hundreds of years of monetary history in 1 session.
- The objectives for this session are:
  - Understand the main functions of currency and be able to apply them when analyzing various types of historical, current or future currencies
  - Understand, at a high-level, the main forms of currencies used over time and the evolution toward fiat currency
  - Understand, from a monetary perspective, how Bitcoin, the most popular cryptocurrency, is designed
- At some level, this is the most theoretical of the sessions as it is simply to provide a framework and some context about currency in general that might be helpful during the remainder of the course

Agenda

1. The Functions of Currencies
2. Barter through Coinage
3. Coinage through Fiat Currency
4. Bitcoin as a Currency?
5. Conclusions
6. Further Reading

1. The Functions of Currencies

The 3 Main Functions of A Currency

Medium of exchange

- ***No currency is perfect on all these dimensions – all present trade-offs***

Unit of account

Store of value

Medium of Exchange

- What is a medium of exchange?
  - The ease/efficiency which a currency can be exchanged for products and services.
  - Current currencies represent a more efficient way to exchange products and services than the barter system (that otherwise requires a "double coincidence of wants" – see slide 11)
  - In this regard, money serves the role of an intermediary between the products or services that people want to trade.

- What makes a good medium of exchange?
  - **Durability:** Whether money can be passed around without the danger of wear and damage. Generally yes for traditional currencies, but there is a slight danger of damage and wear
  - **Transportability:** Whether money can be easily put in my pocket and transferred anywhere. But can they be transferred online without limits?
  - **Divisibility:** A 10-Euro bill can be exchanged for two 5-Euro bills etc.
  - **Fungibility:** Interchangeable? I can exchange 10 Euros for a meal or for 11.38 US Dollars.
  - **Non-counterfeitability:** Fake paper money are everywhere. A long-standing problem for almost all currencies.

Unit of Account

- What is a unit of account?
  - Prices are quoted in terms of money rather than other goods. Prices can indicate the **measurement of the value** of goods, services, economic activities, assets and liabilities.
  - For example we tend to say that:
    - The price of a bottle of Vodka is 50 Euros. We do not say that the price of a bottle of Vodka is equal to 0.0056 Bitcoins. Therefore Euros in this case, (and money in general) is a much better unit of account than any other cryptocurrency.
- **Stability** of the value of the unit of account makes it more useful as a unit of account.
  - In inflationary currencies, for example, over long periods of time, results are not comparable, leading to the need to use nominal (actual) vs. real (inflation-adjusted) values in order to make measurements comparable again.

Store of Value

- What is a store of value?
  - A store of value is a mechanism by which wealth can be saved and retrieved in the future with some predictability about its future value
  - Store of value is not a function solely of currencies, but of assets in general
  - As all asset prices have greater or lesser degrees of unpredictability, there is no perfect store of value
- What drives the ability of something to be a ‘store of value’?
  - Current expectations of stable or predictably knowable future demand for the asset
  - Current expectations of stable or predictably knowable future supply of the asset
- Notable Stores of Value:
  - Gold / Silver / Diamonds
  - Reserve currencies and/or the bonds of reserve currency nations
  - Stocks / Bonds / Real Estate

Note that all of these assets are subject to volatility and none are a perfect store of value

2. Barter through Coinage

Barter

- The earliest form of commerce and trade was through barter, an activity of simply trading goods or services directly, without any intermediary ‘medium of exchange.’ In small villages or tribes, with limited specialization of production and similar needs and wants, this was an acceptable approach
- Barter suffers in a modern specialized economy from the need to uncover a “double coincidence of wants” (William Jevons, Carl Menger, late 19th century). If you assume that everyone is both a seller and buyer of goods and services, the seller has to believe that the good / service that they are receiving from their buyer will, in turn, be acceptable to the sellers that they buy from, a “double coincidence” that imposes significant costs
- What is perhaps surprising, in this light, is barter’s resiliency in some pockets of modern economies:
  - Gift exchange is a form of barter that has not, on the whole, been supplemented with more efficient methods like cash transfers
  - Even as late as the 1980s, there were many bilateral agreements, most notably with the Eastern Bloc and Iran, that primarily involved commodities (such as oil or grain) being exchanged for heavy industrial equipment and products

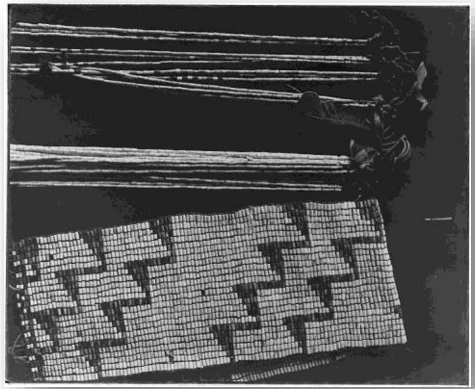
Primitive Money

"All money that is not coin or, like modern paper money, a derivative of coin"
– P. Grierson, Professor of Numismatics at Cambridge

- Primitive money was the only form of money until coinage was invented in Lydia (Greece) in the 7th Century BCE
- Remained in heavy parallel use through the 19th century - e.g. tobacco was made legal tender in Virginia in 1642 and remained so for nearly two centuries
- Remains in parallel use in isolated economies – e.g. cigarettes in prisons
- While an improvement on barter in terms of efficiency, can suffer as a medium of exchange in the areas of transportability, durability, fungibility and divisibility. It is also vulnerable to positive and negative supply shocks that cause price volatility, making it, at times, unstable as a store of value and unit of account

Notable Forms of Primitive Money

Cowry Shells



Wampum Belts

Cattle

Whale's Teeth

Grain

Tobacco

Image Source: Wikimedia Commons

The curious case of the Rai of Yap

A Rai stone, definitely not transportable

Image Source: Wikimedia Commons

The curious case of the Rai of Yap

- The Rai are large stone disks used on Yap island in the Western Pacific. They were “minted” from the limestone deposits of the nearby island of Palau and used as a currency until the 20th century.
- Given their size (up to 9,000 pounds), Rai stones were not moved when spent, but simply changed owners. Every transaction was ‘recorded’ orally within the small community, with the stone’s ownership history becoming common knowledge. Eventually, the “transaction history/ledger” became the only part that mattered (e.g. a stone was once dropped by the canoe transferring it to Yap and sank. The stone was deemed to still be money, since it still exists, even though no one has seen it since, or had access to it)
- This is particularly important, because it demonstrates a naturally occurring use of a ledger of transactions. This ledger was shared orally between the inhabitants, attributed ownership and delegated property without a single stone moving, because everyone agreed on it
- <u>Does this indicate any similarities between Rai ledger and the blockchain?</u>

The Invention of Coinage

- Modern coinage was first invented either in ancient China or ancient Greece, depending on how one defines the separating line between primitive money and modern coins

- China created metal cowries (along with spades, hoes and knifes) as early as 1200 BCE – these metal objects can be considered either institutionally standardized primitive money or early modern coinage.
  They eventually evolved into standardized circular coins around 200 BCE, though solely of base metals, and, therefore, in very low denominations

  - Historical note: As Portuguese trade emerged with China in the 15th century, these coins became known by their Tamilian (South Indian) name of காசு / kāsu / coin money. Today, that name survives, for money in small denominations, in the English word “cash”

- The first clearly modern coinage was developed in Lydia, a Greek kingdom (in modern-day Turkey) in approximately the 7th century BCE, in stamped coins of electrum (a gold/silver mix). While ingots previously existed in Cappadocia and Crete, the Lydian coins are generally accepted as the first modern coinage in form and style and marked a big step forward in transportability, standardization and institutionalization

The Invention of Coinage

Early 6th Century BCE Lydian Coins

Western Han Ban Liang ("Cash")

Image Source: Wikimedia Commons

The Era of Coinage

- After coinage was invented in Lydia, it spread through the Greek city-states and was eventually adopted by the Romans.
- In aggregate, metal coinage became the dominant form of currency in Western economies well into the 18th or 19th century and was issued in a bewildering number of permutations and combinations. A money changer's manual published in Amsterdam in 1606 listed 341 silver and 505 gold coins[1]
- The fact that coins contained valuable commodity metals led to ongoing difficulties with debasement and shaving/clipping
- Coin issuers were perpetually tempted to debase coins (reduce the quantity of valuable metals in coins)
  - Users of coins were also tempted to shave or clip coins, a minor benefit on a per-coin basis, but in aggregate a profitable exercise.
  - Debasement led to Gresham's law that "Bad Money drives out Good Money" – in other words, people prefer to hold on to clearly good money and spend clearly bad money until only bad money is in circulation
- Changes in the prices of the underlying metals change the effective value of the coin relative to its initial value, making useful comparisons across time difficult – <u>Unstable Unit of Account</u>

[1]Richard Van Der Borght, "A History of Banking in the Netherlands," The Journal of Commerce and Commercial Bulletin, 1896, Vol IV, p.192

3. Coinage through Fiat Currency

Some Useful Definitions

Commodity money:	Money that has some other non-monetary use and value (e.g. gold for jewelry). Both primitive and modern money can be commodity money
Gold standard:	This is a form of commodity-backed money or, under some definitions, representational money, where paper notes were redeemable for gold (or, in alternative models, silver)
Fiat money:	Any legal currency defined as money by government law or regulation which is not backed by a physical commodity
Legal tender:	A payment method which is recognized as legal when it is offered to meet a financial obligation.
Bank notes:	Also: bill, note, paper money. A form of promissory note made by a bank, payable to the bearer on the stated sum

Jiao Zi – The First Paper Bank Note

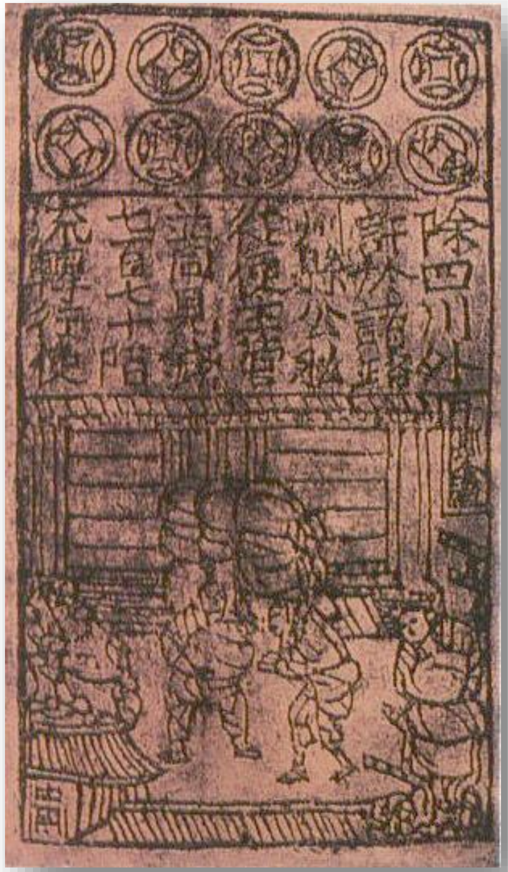


Image Source: Wikimedia Commons

Chengdu, Sichuan Province, China

~10^{th} century AD

Paper Currency Emerged in China

- General consensus is that paper currency emerged in China
- As was seen hundreds of years later in Amsterdam, the origins of paper currency, began with receipts of deposits of coin currency. As we recall, Chinese ‘cash’ coinage was in very small denominations, making it unwieldy for large commercial transactions
- Merchants would deposit their coinage at a small number of government-authorized deposit shops and use their receipts to trade more conveniently
- By 1120, the government had recognized the potential of paper money and started issuing the first generally circulating banknotes, granting itself a monopoly in the area. Currency remained regional until 1265 when the Song government produced a national currency, with notes representing 1 to 100 strings of ‘cash’

Marco Polo described this innovation

"With these pieces of paper, made as I have described, he [Khubilai Khan] causes all payments on his own account to be made; and he makes them to pass current universally over all his kingdoms and provinces and territories, and whithersoever his power and sovereignty extends. And nobody, however important he may think himself, dares to refuse them on pain of death. And indeed everybody takes them readily, for wheresoever a person may go throughout the Great Khan's dominions he shall find these pieces of paper current, and shall be able to transact all sales and purchases of goods by means of them just as well as if they were coins of pure gold. And all the while they are so light that ten bezants' worth does not weigh one golden bezant.

Furthermore all merchants arriving from India or other countries, and bringing with them gold or silver or gems and pearls, are prohibited from selling to any one but the Emperor. He has twelve experts chosen for this business, men of shrewdness and experience in such affairs; these appraise the articles, and the Emperor then pays a liberal price for them in those pieces of paper. The merchants accept his price readily, for in the first place they would not get so good a one from anybody else, and secondly they are paid without any delay. And with this paper-money they can buy what they like anywhere over the Empire, whilst it is also vastly lighter to carry about on their journeys."

Marco Polo and Rustichello of Pisa, "Book Second, Part I, Chapter XXIV: How the Great Kaan Causeth the Bark of Trees, Made into Something Like Paper, to Pass for Money over All His Country," in *The Book of Ser Marco Polo: The Venetian Concerning Kingdoms and Marvels of the East*, translated and edited by Colonel Sir Henry Yule, Volume 1 (London: John Murray, 1903)

The Bank of Amsterdam, Part I

- Depository receipts for precious metals had existed in Southern Europe countries for centuries, but the first true public bank was the Bank of Amsterdam, founded in 1609

- The Bank of Amsterdam was guaranteed by the City of Amsterdam and was tasked with bringing order and efficiency to the wide range of coinage in circulation in Amsterdam, a major commercial center at the time

- The Bank accepted local, foreign and debased coins, valued them according to common standards, and then gave credit in an account in a common value, 'bank money,' for which it issued a receipt (and charged a small administrative fee). This standardization of values significantly diminished the incentives to debase money (and the profitability of doing so) and was an important step in making European currency more efficient

- As in China, we see that the first step toward paper money was a receipt for metal coinage, that itself became tradeable

- Bank of Amsterdam, however, also presaged several other modern Central Banking and banking concepts including:
  - A state guarantor, while maintaining an independent entity from the Treasury
  - A form of legal compulsion (the bank money was required to be used for transactions above a certain value)
  - Fractional reserve lending (something we will discuss in the next page)

The Bank of Amsterdam, Part II

- The Bank of Amsterdam, initially operated solely as a depository institution, on a 100% reserve basis. In other words, none of the precious metals on deposit were loaned out to other parties

- In time, however, the Bank of Amsterdam started lending money to the Dutch East India Company, initially on a short-term basis, out of the deposits of others

- This activity is known today as ‘fractional reserve banking’ and is a key aspect of how money is created and how money supply is managed in a modern economy. We will discuss this later in the course, in the session on Central Banking, but, for now, it suffices to note that this was one of the earliest steps toward modern fiat money, generating notes that were only fractionally backed by metal deposits

- Unfortunately, the Dutch East India Company fell on progressively harder times and eventually defaulted to the Bank of Amsterdam. So, in a manner that would be repeated by thousands of banks over the ensuing centuries, the Bank of Amsterdam become an early victim of overly optimistic lending, was taken over by the City of Amsterdam in 1791 and wound up in 1819

The Bank of England

- Unlike the Bank of Amsterdam, the Bank of England, founded in 1694, survived through to the present day, became the predecessor of all modern Central Banks and was, for centuries, the most important Central Bank in the world, during the period that the pound sterling was the world reserve currency

- The Bank of England was founded as a private bank, incorporated to allow William III to borrow 1.2M sterling that the city goldsmiths could not support. In exchange for a share rights offering of 1.2M sterling (that was then lent to the government), the bank gained the right to issue notes, including against the government bonds it had received

- This was an important right and another step toward modern fiat currency. In time, and through a succession of Acts restricting its competitors, the Bank of England came to monopolize bank note issuance in England and Wales, effectively become the Central Bank of the UK

Bank Notes & Legal Tender: UK Case Study

- Many people believe 'legal tender' means 'you are required to use this currency' and this subsequently gives currency its value

- The Anglo-Saxon definition is quite different and narrow, simply stating that a debtor cannot refuse settlement of an existing debt in the legal tender of the nation. In other words, the legal tender can be used as a Medium of Exchange for outstanding debt (but does not require its use for prospective transactions nor as a Unit of Account)

- <u>In the UK</u>:
  - The Bank of England is the only bank authorized to issue banknotes in England & Wales and its notes are legal tender in both
  - In Scotland and Northern Ireland, however, banknotes are still issued by seven retail banks (thanks to an Act in 1845), provided they keep equivalent assets on deposit at the Bank of England. These banks are, in Scotland, the Bank of Scotland, Clydesdale Bank, Royal Bank of Scotland and, in Northern Ireland, the Bank of Ireland, AIB Group, Northern Bank, Ulster Bank
  - Interestingly, neither the bank notes of the Bank of England, nor the bank notes of the private banks in Scotland and Northern Ireland, are considered legal tender in Scotland or Northern Ireland. In fact, no bank notes of any kind are legal tender in Scotland and Northern Ireland (though some coinage is in limited amounts)

- Bank notes are, of course, accepted for day-to-day trade in Scotland and Northern Ireland as a matter of convention without being legal tender. This is an excellent reminder that almost all currencies are accepted largely as a matter of convention

The USD and the Federal Reserve

- By the 20th Century, the US dollar (USD) had replaced the pound sterling (GBP) as the most important reserve currency in the world and, as a consequence, the Federal Reserve became the key Central Bank in the world

- Like the GBP, the USD exhibited a long history of fluctuating through periods of convertibility and non-convertibility to metals throughout its history. Specifically, the USD has been a fully metal-backed currency for 124 years of its existence, a fully fiat currency for 58 years and quasi-metal-backed for 39 years, as follows:
  - 1792-1834: Bimetallic Standard (Gold and Silver), but Basically Silver
  - 1834-1862: Basically Gold Standard
  - 1862-1879: Fiat Paper Money
  - 1879-1933: True Gold Standard
  - 1934-1973: Quasi-Gold Standard (only for foreign exchange with Central Banks, not for individuals)
  - 1973-present day: Fiat Paper Money
- Today, the USD is a 100% fiat currency with no redeemability into any commodity assets, managed by the Federal Reserve, the Central Bank of the United States

- As with many modern fiat currencies, the dollar is managed with a bias toward slight inflation (targets are usually 2-3% per year) in order to discourage hoarding of money, stimulate economic activity and maintain full employment

Bretton Woods – The Quasi-Gold Standard

- Toward the end of World War II, at the Bretton Woods conference (July 1944), many major world economies attempted to regulate future intra-country financial flows and currency 'competition' through fixed exchange rates pegged to the USD, itself pegged to gold

- The structure of Bretton Woods was based around the USD
  - The USD would remain redeemable for gold at $35/ounce
  - Ratifying countries pegged their currencies to the USD (generating an implicit gold standard for them)
  - The newly formed International Monetary Fund would act as a bridge for payment imbalances among the ratifying countries

- This gold standard was not available to citizens, just to counter-party Central Banks so it is not considered a full gold standard

- The peg to gold ran into severe difficulties in 1968. The USA, abandoned the Bretton Woods agreement in August 15, 1971. Gold could no longer be exchanged at a fixed rate with US Dollars (also called the "Nixon Shock")

- This action effectively marked the end of metal-backed sovereign currencies and the move from commodity money to fiat money

Currently no countries use a gold standard – all sovereign currencies today are fiat currencies

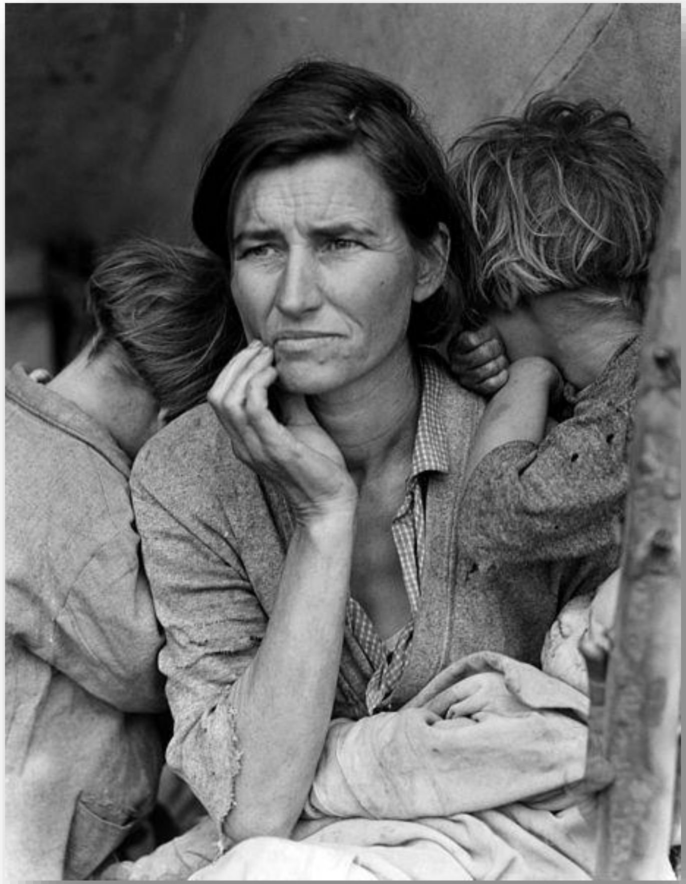
Simplification: From metals to paper

Physical Metal Coinage	Receipts for Metal Coinage Storage	Notes Redeemable in Metal	Notes Not Redeemable in Metal “Fiat”
~700 BCE (Greece)	**900 AD (China)**	**~1200 AD (China)**	**1800s+ (on & off, in West)**
~200 BCE (China)	**~1600 AD (Europe)**	**~1700 AD (Europe)**	**Globally, post-1973**

Primitive / commodity money has continued to exist in parallel through most of this period

When Currency Goes Wrong: Deflation & the Great Depression

Bank Run, American Union Bank



Destitute Migrant Workers, 1932

Image Source: Wikimedia Commons

When Currency Goes Wrong: Deflation & the Great Depression

- The stock market collapse of 1929 triggered a recession in the United States

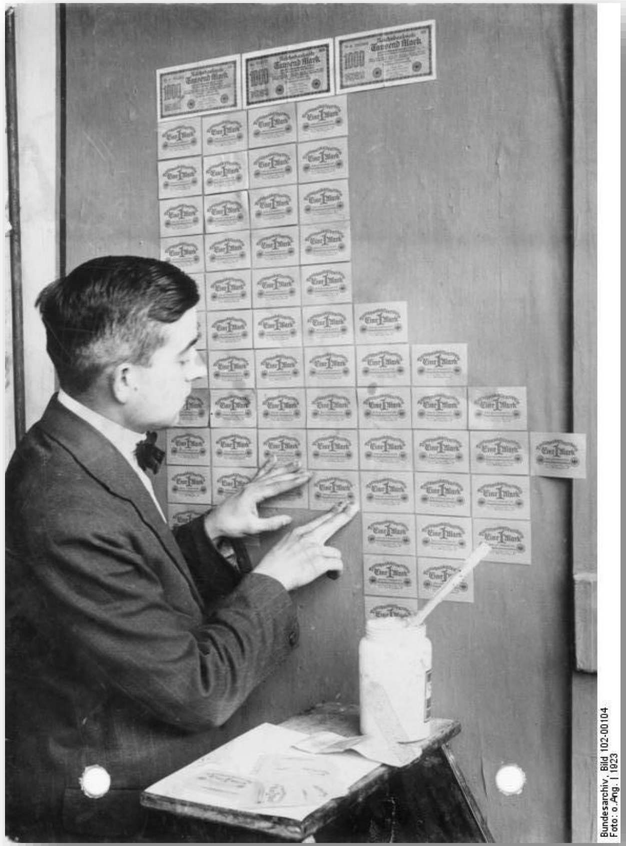
- Constrained by the gold standard, the Federal Reserve constricted money supply, causing severe deflation. Deflation, by making debts larger in real-terms, tends to create a self-fulfilling trap for economies, with progressive defaults, and increased unemployment (and loss of productive output caused by that increased unemployment)

- The Great Depression effectively caused the end of the domestic gold standard in the United States. In 1933, with severe deflation ravaging the economy, Congress and President Roosevelt took the following measures:
  - Devalued the dollar in gold terms
  - Suspended the gold standard (except for foreign exchange)
  - Revoked gold as universal legal tender for debts
  - Banned private ownership of significant amounts of gold coin in order to increase Treasury holdings of gold

- Some parts of Southern Europe (e.g. Greece) are facing a modern form of the same issue via their use of the Euro. Given their severe economic depression, the natural response would be to allow their currency to depreciate, making their products and services less expensive, increasing demand for them and increasing employment

  They are, however, locked into an 'expensive' currency that is functioning like a gold standard and forcing the adjustment in prices to happen through internal devaluation (deflation), which is leading to Depression-level unemployment figures (nearly 30% in Greece)

When Currency Goes Wrong: Hyperinflation



Using German Marks as wallpaper

Zimbabwean Notes, 2008

Image Source: Wikimedia Commons

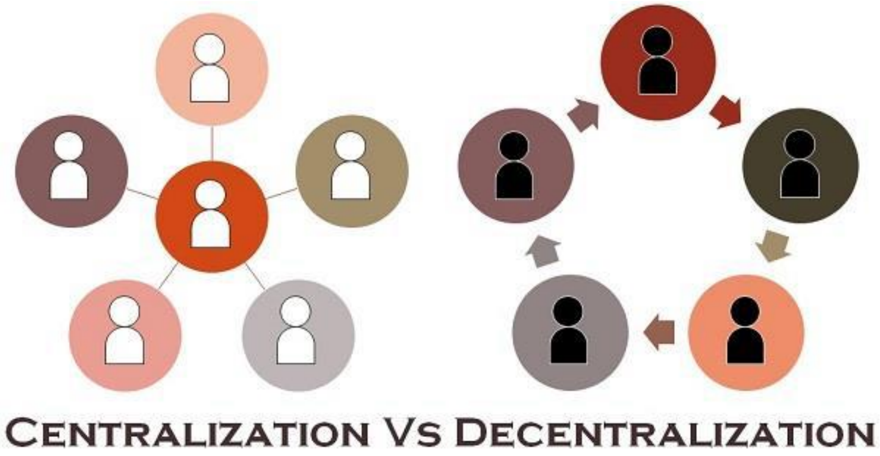
When Currency Goes Wrong: Hyperinflation

- In extreme circumstances, paper currency is vulnerable to hyperinflation if the money supply is not controlled. Two of the examples in the 20th century came from over-printing to meet war obligations
- **Germany, 1923**: Germany had very high war reparation obligations after World War I that it had to meet in foreign currency. Unable to meet its obligations, it tried to print more Marks to buy foreign currency, triggering a further drop in Marks, necessitating more printing and creating a vicious spiral. Once the Mark was untradeable on foreign markets, the printing was used to finance government operations.
  The paper Mark traded at 6.7 Marks to the US dollar in 1919. By November 1923, the US dollar was worth 4,210,500,000,000 Marks
- **Hungary, 1945**: Hungary is believed to have had the single worst episode of hyperinflation in history (for similar reasons – an economy devastated by war and high reparations). Its inflation peak was at 1.3 × 10^16 percent per month (which approximately means that prices doubled every 15 hours)
- Inevitably, in cases of hyper-inflation, the country re-denominates its currency and has to start anew. See here for the most known examples
- While there is no hard line, aside from extreme cases like the above, it is believed that once inflation reaches double-digits, it starts having negative coordination effects in the economy in terms of requiring constant re-adjustment of prices and wages to stay in sync. Most credible modern Central Banks try to keep inflation in the 2-3% range

4. Bitcoin/Cryptocurrencies as a currency?

Private currencies

- A large number of private currencies have been created by a **centralized issuer** with specific uses (in-game or community currencies) by a number of communities or organizations. Examples: Facebook Credits, Linden Dollars, Disney Coins



https://keydifferences.com/difference-between-centralization-and-decentralization.html

- Reasons of creation: Inflation Avoidance, Increased Velocity of Money, Facilitation of Trade, Mutual Exchange of Credit – Similar to Crypto?

- They are often vulnerable to regulatory pressures e.g. Liberty Reserve (Costa Rica's centralized digital currency)

Bitcoin and other Cryptocurrencies

Private:	Not issued by an official state authority
Decentralized:	No centralized issuing party / counter-party, instead units are issued to a decentralized group of users
Digital:	Fully electronic currency, no physical coins or notes
Cryptocurrency:	Anti-counterfeiting is conducted through cryptography. No fake coins

↓

A private decentralized digital cryptocurrency

For discussion: Is Bitcoin a fiat currency (used only by convention) or a commodity-backed currency (where the commodity is the usage of the applications that the Bitcoin network enables)?

Bitcoin: The Blockchain

- Bitcoin's most prevalent innovation is the concept of the "blockchain", a publically reviewable ledger containing a verified record of every Bitcoin transaction. Bitcoins act as the mediums of exchange in this network and exist only as entries in the decentralized Bitcoin ledger
- https://www.smartbit.com.au/
- https://blockexplorer.com/ and more…
- **Blockchain is a decentralized data structure that allows untrusted participants to transact directly with each other and stores the history and state of these transactions**
- Blockchain is an ownership database that needs no central issuer, controller, verification or storage
- More on this on a later session

Bitcoin: Monetary Policies

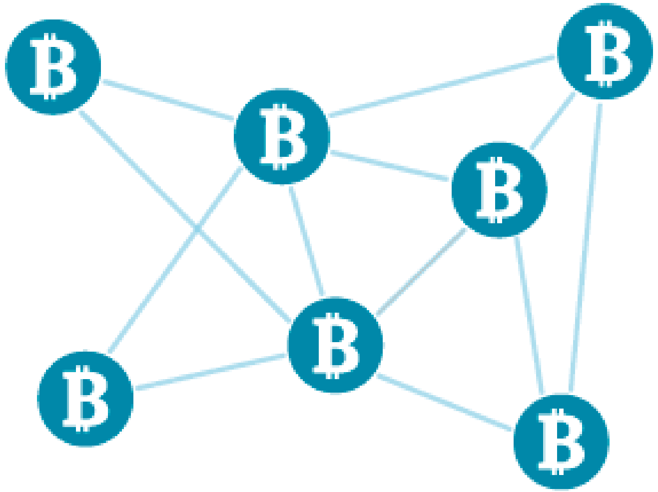
The network facilitated by the same protocol has a number of interesting features from a **monetary perspective**.

- **Fixed Supply**: The money supply is regulated from the protocol itself and only 21,000,000 bitcoins (BTC) will ever exist. They are being issued on a declining schedule (currently 12.5 BTC every approximately 10 minutes)
- **Transparent "monetary policy":** This policy is available to everyone to examine and verify, as the protocol is based on open source code
- **Driven by consensus**: Each user chooses to agree on the **proposed set of rules**, propose their own, or recreate the whole network with their own set, but independently from the original (as the changes would not be compatible). Key characteristics (like money supply) can't change unless a majority of participants in key parts of the system vote to change them

Bitcoin as a Medium of Exchange

Bitcoin shows very interesting potential as a digital medium of exchange:

- **Highly durable**: No way for it to degrade/break (it is just code) and the blockchain is backed up on thousands of computers globally
- **Highly portable**: No intermediaries, worldwide, initial confirmation in about 10 minutes and near-irreversibility in an hour. Can be 'transported' i.e. change ownership
- **Highly fungible**: All bitcoins have the same value, regardless of who owns them or what their history is. Can be exchanged for products/services
- **Highly divisible**: Each bitcoin can be divided into 100 million units
- **Highly resistant to counterfeiting**: Bitcoin funds are assigned to a specific address (i.e. the individual who owns the address). Cannot be duplicated.



Source: https://www.theglobeandmail.com/report-on-business/explainer-what-is-bicoin-and-how-do-you-buy-it/article15501238/

Bitcoin as a Unit of Account

 = 3530 US Dollars

 = 3100 Euros

0.001 BTC = 3.53 USD

0.0001 BTC = 0.31 Euros

But

- **<u>Significant fluctuations in Price. Just think about the hypes (2017) and crypto winters (2018) we have already experienced</u>**

Could the price become more stable over time? Probably, after:

- Regulatory environment will become clearer over time.
- Markets between Bitcoin and fiat currency will become more liquid. (i.e. at a point more cryptocurrency users will buy/sell big amount of money but the price will not change so significantly as now)
- There is an increased development of futures markets between Bitcoin and fiat currency, which may stabilize spot prices

Bitcoin as a Store of Value

- Over the last few years, its price has risen dramatically, before the 2018 bearish run
- Still, high volatility. Price depends on Demand and Supply

On the other hand:

- Supply is predictable (only 21 million coins will exist)
- Issuance of new coins is predetermined
- It decreases in half every ~4 years
- Imposed regulations will help over time

- Bitcoin and cryptocurrencies in general are clearly not a perfect store of value because of the significant fluctuations in price. (the same applies to a lesser degree for traditional currencies)

Bitcoin as a Unit of Account/Store of Value(?)

Source: www.coinmarketcap.com

Bitcoin/Crypto Advantages for the average consumer

- **Bitcoin is not just digital money**: It is a financial instrument, a currency, a method of investment, a medium of exchange, a unit of account a store of value, a type of settlement system and many more
- **Freedom in payments**: Any amount of money can be sent anywhere globally and without limit restrictions. It does not matter if it is a bank holiday or if the time of the required transaction is after midnight
- **Transparency:** Cryptographically secured transactions are presented on the Blockchain, which allows anyone to verify the validity of them
- **Personal information is not displayed:** Possibility of fraud on payments or theft of coins is eliminated.
- **Low transaction fees(how applicable is it now?)**: Regularly, Bitcoin fees used to be significantly low (between 5 to 10 cents of the US dollar), while transaction fees via other methods like credit cards, PayPal and Western Union in some occasions may reach the level of 9%-10% of the transaction. Alternatives of Bitcoin have emerged to address cost and time issues e.g. Bitcoin Cash

Bitcoin/Crypto Disadvantages for the average consumer

- **Volatility**: Enhances uncertainty for people who are not fully aware of the Bitcoin concept. This is due to many different kinds of discussions and events that occur globally
- **No chargeback option**: As soon as the order for execution is performed, no option to cancel a transaction is available
- **Lack of knowledge**: May lead to loss of private keys(which act like passwords). Knowledge on security options is also essential. More on this on a later session.
- **Fees passed to consumers:** Even if the merchant uses BitPay(company which converts Bitcoins to local currencies), BitPay charges a fee of approximately 1% and this is on top of the exchange rate. The customer of the merchant will ultimately pay this as it will be reflected on the product's price, even though it will be hidden.
- **Average transaction time has risen on certain occasions (from minutes to hours/days)**
- **No provision of credit, generally no reward programs**

The Role of Merchants

- Merchants enjoy the irreversibility of Bitcoin transactions and the elimination of the exchange risk assisted by payment processing companies like BitPay and Coinbase.

But,

- Merchants should encourage customers to pay via Bitcoin or other cryptocurrencies, providing them with a relevant **discount** or **loyalty points**.
- By giving incentives to customers to use digital currencies for their payments, merchants will be able to raise demand for their products - therefore their revenue as well.

Conclusions

- Currency has three functions:
  - Medium of Exchange
  - Unit of Account
  - Store of Value

No currency plays all those roles perfectly. There are always trade-offs, between efficiency and stability, ease of use and counterfeitability, inflation risks and deflation risks, and so on

- Currency has passed through the following phases, though long overlapping cycles exist:
  - Barter
  - Primitive Money
  - Commodity Money
  - Fiat Money

- Bitcoin and several other cryptocurrencies represent a new form of currency that is:
  - Private
  - Decentralized, with a fixed algorithmic money supply
  - Possibly commodity-backed

- The current landscape mainly favors the merchants. Discounts and loyalty rewards are able to provide a boost for people to adopt Bitcoin as a method of payment.
- Bitcoin may not be the “king” of cryptocurrencies for long if solutions are not implemented to address average cost and time of transactions.

Some Further Reading

Andreas Antonopoulos: "Mastering Bitcoin, Unlocking Digital Crypto-Currencies"
https://github.com/aantonop/bitcoinbook/blob/develop/ch01.asciidoc
(book available for purchase, but also in Github for public feedback and contribution)

Nick Szabo : Shelling Out – The Origins of Money
http://nakamotoinstitute.org/shelling-out/

The history of money: from barter to bitcoin

https://www.telegraph.co.uk/finance/businessclub/money/11174013/The-history-of-money-from-barter-to-bitcoin.html

Money in the Modern economy: An Introduction (Bank of England)

http://poseidon01.ssrn.com/delivery.php?ID=610126066081067006104082022097116031027087059053021075022004077123068081
002084092106062099021118024016045069092004067089127126016091088002016110003015127123012107031033079110103121
0901271111130650730310980780931060690650670731130061190311201190840 21&EXT=pdf

Some Further Reading

Why Bitcoin Matters, Marc Andreessen
https://dealbook.nytimes.com/2014/01/21/why-bitcoin-matters
(article explaining the basic Bitcoin characteristics, by a Bitcoin evangelist)

Wences Cesares : What is Bitcoin ?
https://www.linkedin.com/pulse/20141120164624-208991-what-is-bitcoin
(overview of Yap and it's parallels with Bitcoin)

What is Bitcoin?
https://www.coindesk.com/information/what-is-bitcoin/

Bitcoin: Money or Financial Investment?
https://files.stlouisfed.org/files/htdocs/publications/page1-econ/2018/03/01/bitcoin-money-or-financial-investment_SE.pdf

From Barter to Bitcoins
https://www.blockchaintechnews.com/blogs/from-barter-to-bitcoins-the-evolution-of-international-money-transfers/

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