# The Bitcoin Standard

## Chapter 1 - Money

Process of *direct exchange* - **Barter**

The problem of **coincidence of wants**:

You want to acquire is produced by someone who doesn’t want what you have to sell

Only way around this is through *indirect exchange*: you tr/to find some other good that another person would want and find someone who exchange it with You for what you want to sell.

That intermediary is a **medium of exchange**

* While any good could serve as the medium of exchange, as the scope and size of the economy grows it becomes impractical for people to constantly search for different goods that their counterparty is looking for, carrying out several exchanges for each exchange they want to conduct.
* The quintessential function that defines money
* Carl Menger, the father of the Austrian school of economics and founder of marginal analysis in economics,
  + Key property that leads to a good being adopted freely as money
    - **Salability -**the ease with which a good can sold on the market
    - Throughout human his many things have served the function of money: gold and silver, most notably, but also copper, seashells, large stones, salt, cattle, government paper, precious stones, and even alcohol and cigarettes in certain conditions. Peoples choices are subjective, and so there is no “right” and choice of money. There are, however, consequences to choice

The second function of money: **store of value**

* + - It is safe to say anyone who thought he could store his wealth for the term in fish, apples, or oranges learned the lesson the hard way and had very little reason to worry about storing wealth for a while.
    - The relative difficulty of producing new monetary Units determines the hardness of money: money whose supply is hard to increase is known hard money, while easy money is money whose supply is amenable to large increases.
      * 1) the **Stock**, which is its existing supply, consisting of everything that has been produced in past, minus everything that has been consumed or destroyed ;
      * 2) **Flow**, which is the extra production that will be made in the next time period.
      * The ratio of the stock to the flow, is a reliable indicator of a good’s hardness as money
      * The higher the ratio of a stock to flow, the more a good is to maintain its value over time and thus be more salable across time.

*If people choose* a **hard money**, with a high **stock-to-flow** ratio, as a of value, their purchasing of it to store it would increase demand causing a rise in its price, which would incentivize its producers to make more of it.

The easy money trap: anything used as a store of value have its supply increased, and anything whose supply can be easily increased will destroy the wealth of those who used it as a store of value.

* Something to assume a monetary role, it has be costly to produce, otherwise the temptation to make money on cheap will destroy the wealth of the savers, and destroy the incentive has to save in this medium.

In reality, the choice of what makes the best money has always been determined by the technological realities of societies shaping the salability of different goods.

The *soundness of the monetary media*, in terms of its ability to hold value time, is a key determinant of how much individuals value the present the future, or their **time preference**, a pivotal concept in this book.

Social settings with peer-to-peer interactions, as computing protocols demonstrate, it natural for a few standards to emerge to dominate exchange, because gains from joining a network grow exponentially the larger the size of the network.

The third function of money: **unit of account**

Only with a uniform medium of exchange acting as a unit of account does complex economic calculation become possible, and with it conies the possibility for specialization into complex tasks, capital accumulation, and large markets.

Having a single medium of exchange allows the size of the economy grow as large as the number of people willing to use that medium of exchange.

The Producing capital goods that will produce final consumer goods after longer intervals,

As capital accumulation has made the process longer, it has become more productive per unit of labor, and it can produce superior products that were never possible for the primitive economy with asic tools and no capital accumulation.

None of this would be possible without money playing the roles of medium of exchange to allow specialization; store of value to create future-orientation and incentivize individuals to direct resources to investment instead of consumption; and of account to allow economic calculation of profits and losses.

Technological advance has allowed us to utilize a new form of money with added benefits, but, as always, new pitfalls.

Only this background in place can we then move on to understand how Bitcoin functions and what its role as a monetary medium is.

## Chapter 2 - Primitive Moneys

Of all the historical forms of money, the one that most resembles Bitcoin is the ancient system based on Rai stones on Yap Island, today a part of the Federated States of Micronesia.

* Native to Yap, which did not contain any limestone, and all of Yap’s stones were brought in from neighboring Palau or Guam.
* a remarkable tale of the Rai stones lost their monetary role is an object lesson in how money loses its monetary status once it loses its hardness.
* Quarrying and then shipping
* required hundreds of people to move,
* placed in a prominent location
* Effectively no way of stealing the stone because its ownership was known by everybody

Different sizes of the different stones provided some degree salability airmen les, as to possibility of paying with fractions of stability

Salability across time was assured for difficulty and high cost of acquiring new stones, high stock-to-flow ratio,

And no matter how desirable they were, it was not Easy for anyone to inflate the apply of stones by bringing in new

Until 1871, David O’Keefe was shipwrecked on the shores

-saw a profit opportunity in

Because they were very content lives as they were, in their tropical paradise, and had no use for whatever foreign forms of money he could offer them.

Village chief banned his townsfolk from working for the stones, which were gathered too easily.

The island disagreed, and they did supply O’Keefe with the coconuts he sought. This resulted in conflict on the island, and in time the demise of Rai stones as money.

Symbolic,

Devaluing the island’s existing stock. It

Underlying dynamic of a drop in stock-to-flow ratio has been the same for every form of money that lost its monetary role, up to the collapse of the Venezuelan bolivar place as these lines are being written.

* Similar story happened with the aggry beads used as money for centuries in western Africa.
  + precious in an area where glassmaking technology was expensive and not very common, giving them a high stock-to-flow ratio, making them salable across time.
  + Being small and valuable, these beads were salable across scale, because they could be combined into chains, necklaces, or bracelets; though this was far from ideal, because there were many different kinds of beads rather than one standard unit
    - beads were not expensive and had no monetary role in Europe,
    - producers could flood the market with them—in other words, had a low stock-to-flow ratio.
    - “Slave beads”
  + Started importing them in mass quantities from europe
  + Africa slowly turned beads from hard money to easy money, destroying their salability and
    - causing the erosion of the purchasing power of these beads over time in the hands of the Africans who owned impoverishing them by transferring their wealth to the Europeans, could acquire the beads easily
* One-time collapse in value of a monetary medium is tragic, but at least it is over quickly it's holders can begin trading, saving, and calculating with a new
  + But a slow drain of its monetary value over time will slowly transfer wealth of its holders to those who can produce the medium at a low •ost. This
  + Lesson worth remembering when we turn to the discussion the soundness of government money in the later parts of the book.

Native America early European settlers used wampum shells extensively’ for the reasons as aggry beads: they were hard to find, giving them a high stock-to-flow ratio, possibly the highest among durable goods available the time.

* Not being uniform units,
* Legal tender from 1636,
* British gold and silver coins started flowing to North America, these were preferred as a medium of exchange due to their uniformity, allowing for better and more uniform price denomination giving them higher salability.
  + 1661, seashells stopped being legal tender and eventually lost all monetary role
  + Industrial civilization, with fossil-fuel-powered boats, ma
  + ancient forms of money include cattle, cher ish-’ 1 able across space due to their mobility
    - Cattle divisibility across scales,
* Historical facts are still apparent in the English language, as the
  + **Pecuniary** is derived from pecus, the Latin word for cattle, while the word salary is derived from sal, the Latin word for salt s
  + Seashells, stones, beads, cattle, and salt because uniform, highly valuable small units that could be removed
  + Utilization of hydrocarbon fuel energy.
* Increase in the new supply (flow)
  + The of money that relied on difficulty of production to protect their stock-to-flow ratio lost it.
  + With modern hydrocarbon fuels, Rai stones could be quarried easily, aggry beads could be made for very little and seashells could be collected en masse by large boats.
* What most modern economists fail to grasp:
  + a money that easy to produce is no money at all, and easy money does not make a society richer;
  + on the contrary, it makes it poorer by placing all its hard-earned wealth for sale in exchange for something easy to produce.

## Chapter 3 - Monetary Metals

Human technical capacity - more sophisticated

* Our utilization of metals and commodities grew,
  + Highly salable monetary media
* Initially not easy, making it hard to increase their supply quickly and good salability across time.
* Durability and physical properties, as
  + Relative Abundance in earth, some metals were more valuable than others. Iro
  + Iron & copper, because of their relatively high abundance and their susceptibility to corrosion, could be produced in increasing quantities.
    - Existing stockpiles would be dwarfed by new production, destroying the value in
    - These metals developed a relatively low market value and would used for smaller transactions. Ra
  + Rarer metals such as silver and gold, on other hand, were more durable and less likely to corrode or ruin,
    - Virtual indestructibility in particular,
      * allowed humans to store value across generations, thus allowing us to develop a longer horizon orientation.
    - Initially, bought and sold in terms of their weight,
    - Mint them into uniform coins and brand the
      * Saving people from having to weigh and assess the
  + Prime form of money for Around 2,500 years,
    - the time of the Greek king Croesus, who the first recorded to have minted gold coins, to the early twentieth century.
* Coins were the goods most salable across time,
  + because ‘century also most salable across space,
  + because they carried a lot in small weights, allowing for easy transportation.
* Standardizing values into easily identifiable units-,
  + allowed for the creation of large markets, increasing the scope allowed for the creation ot
  + Created economic problems from the fluctuation of their values over due to the ebbs of supply and demand,
  + and created problems for owners of these coins, particularly silver, which experienced declines due to increases in production and drops in demand.
* Governments and counterfeiters could, and frequently did, reduce the precious metal content in these coins, causing value to decline by transferring a fraction of their purchasing power
  + Compromised the purity and soundness
  + Improvement in methods of communication,
  + Transactions possible at any scale, the:
  + By centralizing the gold in the vaults of banks,
  + Supply of money beyond the quantity of gold devaluing money and transferring part of its value from the money’s legitimate holders to the governments and bank;

### Why Gold?

Differentiating between a good’s **market demand**

(demand for consuming or holding the good for its own sake)

* and its **monetary demand** 
  + (demand for a good as a medium of exchange and store of value).
* Example
  + Imagine a billionaire deciding he would like to store $ 10 billion of his wealth in copper. As his bankers run around trying to buy 1O% of annual copper production, they would inevitably cause the price of copper increase.
    - Asset he decided to buy has already appreciated before he has even completed his purchase. Surely, he reasons, this appreciation will cause more people to buy more copper as a store of value, bringing the price up even more.
  + Binding restraint on how much copper can be produced is how much labor and capital is dedicated to the job. More
    - At some point, monetary demand must subside, and some holders of copper will want to offload of their stockpiles to purchase other goods, because, after all, that was the point of buying copper,
  + All consumable commodities
    - Such as copper, zinc, nickel, brass, or oil, which are primarily consumed and destroyed, not stockpiled.
      * The net effect is the transfer
        + misguided savers to the producers of the commodity they purchased.
  + **Anatomy of a market bubble:** increased demand causes a sharp rise in prices,
    - which drives further demand, raising prices further,
      * incentivizing increased production and increased supply
        + which inevitably brings prices down, punishing everyone who bought at a price higher than the usual market price.
  + Those who choose these commodities as money by devaluing their wealth and impoverishing them in the long run, and returning the commodity to its natural role as a market good, and returning the commodity to its natural role as a market good, not a medium of exchange.
  + Anything to function as a good store of value, it has to beat this it has to appreciate when people demand it as a store of value, but its producers have to be constrained from inflating the supply significantly enough to bring the price down -
    - An asset will reward those who choose it as their store of value, increasing their wealth in the long run becomes the prime store of value, because those who chose other commodities will either reverse course by copying the choice of their successful peers, or will simply lose their wealth.

First, gold so chemically stable that it is virtually impossible to destroy

* Second, gold is impossible to synthesize from other materials and can only be extracted from its unrefined ore, which is extremely rare on our planet.
  + Chemical stability of gold implies that virtually all of the gold mined by humans is still more or less owned by people around the world.
  + Existing stockpile - all mining vs annual - ~1.5%, never + 2%
    - The world is the product of thousands of years of gold production, **orders of magnitude larger than new annual production.**
      * Practically impossible for miners to mine quantities of gold large enough to depress price significantly.
* Silver is a close second
  + Growth rate is historically 5-10%, rising to %20%
    - Does corrode and can be consumed in industrial processes
    - Existing stockpiles are not as large relative to annual production
      * Less rare as gold in earths crust
      * Easier to refine
* For millennia as the main money used smaller transactions, complementing gold, whose high value meant dividing it into smaller units, which was not very practical.
  + International gold standard
    - Industrial metal, losing value compared to gold. Silver

Hunt Brothers 1970’s

### Started buying enormous quantities of silver, driving the price

* + Rationale was that as the price rose, more people would want buy, which would keep the price rising, which in turn would lead to people wanting to be paid in silver. Yet,
    - No matter how much the hunt brothers bought
    - Match for the ability of miners and elders of silver to keep selling silver onto the market.
      * Eventually crashed and the Hunt brothers lost over $lbn
* Stock-to-flow ratio of gold makes it the commodity with the lowest price elasticity of supply w Jiichis defines the percentage increase in quantity supplied over the percentage increase in ce. Gi
  + Even a 35% rise in price can lead to no appre increase in the supply of new gold onto the market.
    - Largest was 15% in production, increasing stockpiles 1.5%
      * Not once since 1942 has it exceeded 2%.
* Unsound money all too frequently coincided with civilizational deline and societal collapse.

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### Roman Golden Age and Decline

The **Denarius** was the silver coin that traded at the time of the Roman republic, containing 3.9 grams of silver, while gold became the most valuable money in the civilized areas of the world at the time and gold were becoming more widespread.

* *Julius Caesar*, created the **Aureus** coin, which contain around 8 grams of gold and was widely accepted across Europe and Mediterranean
  + Increasing the scope of trade a specialization in the old world
* Economic stability reigned for 75 years, even through **political upheaval of his assassination**, which saw the Republic transformed into an Empire under his chosen successor, *Augustus*.
* *Ner*o - “coin flipping”
  + Emperor would collect the coins of the population and mint them into coins with less gold or silver content.
  + As long as Rome could conquer new lands with significant wealth, its soldiers and emperors could enjoy spending their loot, emperors even decided to buY themselves popularity by *mandating artificially low prices of grains and other staples, sometimes granting them for free.* 
    - Instead of working for a living in the countryside, many peasants would leave their farms to move to Rome,
      * Better lives for free.
  + No longer had prosperous lands to be conquered, the ever-increasing lavish lifestyle and growing military required some new source of financing, and the number of unproductive citizens living off the emperor's largesse and price controls increased.
    - Keynes’s Solution to British / US problems
      * Devaluing the currency would at once reduce the real of workers, reduce the burden of the government in subsidizing staples, and provide increased money for financing other government :penditure.
      * Aureus coin was reduced 8-7.2 grams
        + Temporary relief, Denarius from 3.9 to 3.41 g silver
        + Self-reinforcing cycle of popular anger, price controls, coin debasement, price rises,
      * Caracalla(AD 211—217),
        + 6.5

Diocletian (AD 284-305)

5.5g > 4.5 grams of gold

* + - * + Eventually so little silver content of denarius was so little it would disappear with wear and tear
        + Hid inflation with price controls
  + Clipping reduced the aureus”s real value, increasing money supply, allowing the emperor to continue *imprudent spending, but eventually resulting in inflation and economic crises*, the misguided emperors would attempt to ameliorate via further coin flipping.
    - Ferdinand Lips summarizes:
      * It should be of interest to modern Keynesian economists, as well as the present generation of investors, that although the emperors of Rome frantically tried to “manage” their economies, they only succeeded in making matters worse. Price and wage controls and legal tender laws were passed, but it was like trying to hold back the tides.
      * Rioting, corruption, lawlessness and a mindless mania for speculation and gambling engulfed the empire like a plague.
      * With money so reliable and debased, speculation in commodities became far more attractive than producing them
  + The largest market human history with the largest and most productive division of labor the world had ever known.)
    - Basic necessities by trade with the far-flung corners of the
    - Growth in prosperity’
    - Collapse the empire suffered when this *division of labor fell apart*.
  + Fleeing to empty plots of land where
  + Living in self-sufficiency, where their lack of income spared them having to pay taxes.
  + Self-sufficient peasants scattered in isolation an
    - Serfs living under feudal lords.

### Byzantium and the Bezant

* Legacy of *Constantine*
  + maintaining the integrity of the solidus
  + Made it the world’s most recognizable and widely accepted current it came to be known as the **bezant.**
* while Rome burned under bankrupt emperors who could no longer afford to pay their soldiers as currencies collapsed, Constantinople thrived and prospered for more centuries with **fiscal and monetary responsibility** 
  + *Prosperous and free from invasion for centuries.*
  + The fall of Constantinople happened only after its rulers had started devaluing the currency- a [process that historians believe began the reign of Constantine IX Monomachos (1042-lO55)
  + Even after it was debased and its empire fell, the bezant lived on by inspiring another form of sound money that continues to circulate widely to this day in spite of not being the official currency of any nation anymore, and that is the
    - Islamic **dinar**
      * Original weight and size specifications of the bezant,
  + The solidus, first minted by Diocletian in AD 301, has changed its name to the bezant and the Islamic dinar, but **it continues to circulate today.** 
    - Emphasizing the salability of gold across time

### The Renaissance

* In the city-states that humans could live with the freedom to work, produce, trade, and flourish
  + Due largely to sound monetary standard
* Florence’s rise made it the commercial center of Europe, with its florin becoming the prime European medium of exchange, allowing its banks to flourish across the entire continent.
* More than 150) European cities and states. Had minted coins of the same specifications as the florin, allowing their citizens the dignity and freedom to accumulate wealth and trade with a
* A sound monetary standard is a necessary prerequisite for human flourishing.
  + wIthout which society stands on the precipice of barbarism and destruction.
  + Silver’s lower value per unit of weight made it easily divisible into quantities suitable for smaller transactions and for being held for shorter durations.
  + Arrangement had benefits, it had one major drawback:
    - The fluctuating rate of exchange between gold and silver created trade and calculation problems.
* Demise of silver’s monetary role: the telegraph, first deployed commercially in 1837, and the growing network of trains, allowing transportation across Europe.
  + Feasible for banks to communicate with each other, sending payments
  + Led to the increased use of bills, checks, and paper receipts as monetary media instead of physical gold
  + Nations began to switch to a monetary standard of paper fully backed by, and instantly redeemable into, precious metals held in vaults.
  + First to adopt a modern gold standard in 1717, under the direction of physicist **Isaac Newton**, who was the warden of the Royal Mint,
    - Would play a great role in advancing its trade until 1914, although it would suspend it during the Napoleonic wars from 1797 to 1821.
    - The economic supremacy of Britain was intricately linked to its being on a superior monetary standard,
      * European countries began to follow it.
      * Clearance and checks could be cashed from the banks that issued them. This solved the problem of gold’s salability across scales, m:
        + Longer a need for silver’s role in small payments.
        + Demonetization of silver had a significantly negative effect on the nations that were using it as a monetary standard at the time.

India witnessed a continuous devaluation of its rupee compared to gold-based

China, which stayed on the silver standard until 1935, its silver (in various names and forms) lost 78% of its value over the period.

Inextricably linked to this massive destruction of wealth and capital brought about by the demonetization of the monetary metal

* Situation similar to west Africans holding aggri beads as Europeans arrived: domestic hard money was easy money foreigners, and was being driven out by foreign hard money, which allowed foreigners to control and own increasing quantities of che capital and resources of China and India during the period.
  + Historical lesson of immense significance, and should be kept in mind anyone who thinks his refusal of Bitcoin means he doesn’t have to with it.
* With gold in the hands of increasingly centralized banks, it gained salability across time, scales, and location, but lost its property as cash money, making payments in it subject to the agreement of the financial and political authorities issuing receipts, clearing checks, and hoard the gold
  + Individual sovereignty over money and its resistance to government centralized control.
  + Bitcoin, was designed primarily to avoid centralized control.

### La Belle Epoque

* The simple conversion between different weight units, as straightforward as converting inches to centimeters,
  + Each country’s money supply was not a metric to be determined by central planning committees stocked with Ph.D. holders, but the natural working of the market system.
    - Spent as much as they desired
* Accumulation to finance industrialization, urbanization, and the technological improvements that have shaped our modern life -
  + BY 1900, around 50 nations were officially on the gold standard, including all industrialized nations
  + Some of the most important technological, medical, economic, and artistic human achievements were invented during the en the gold standard, which partly explains why it was known as la belle ep0que
* In 1899, when American writer Nellie Bly -record-breaking journey around the world in 72 days,
  + Carried British gold coins and Bank of England world in 12
  + Was possible to circumnavigate the globe and use one of money everywhere Nellie went.
  + In the United States this era was called the Gilded Age,
    - Growth boomed after the restoration of the gold standard in 1879 the wake of the American Civil War.
    - Interrupted by one episode of monetary insanity, which was effectively the last dying pang of silver as money:
      * Caused a large increase the money supply and a bank run by those seeking to sell Treasury notes and silver to gold.
        + Result was the recession of 1893,
* Not only were the economies of the west far freer back then, the societies themselves were far freer.
  + Governments had very bureaucracies focused on micromanaging the lives of citizens.
  + Mises “the seeds of new life and new well-being, freeing minds and souls, and creating riches unheard of before. It accompanied the triumphal unprecedented progress of Western liberalism ready to unite all nations into a community of free nations peacefully cooperating with one another.
    - Greatest and most beneficial of all historical changes 12
* This world came crashing down in the catastrophic year 1914, which not only the year of the outbreak of World War I, but the year that the world’s major economies went off of the gold standard and replaced it world’s major economies went on
  + Only Switzerland and Sweden, who remain into the 1930s.
  + Governments and banks were always cremedia of exchange beyond the quantity of gold in their reserves.
  + Many countries used not just gold in their reserves, but also irrencies of other countries.
  + Britain, benefitted from having its money us as a reserve currency
    - Resulting in its reserves of gold being a tiny fraction of its outstanding money supply. Bank of England’s banknotes became, in the minds of many at the time, “as good as gold.”
* Gold standard was always vulnerato a run on gold in any country where circumstances might lead large enough percentage of the population to demand redemption
* Cumbersome, expensive, and insecure, centralizing physical gold reserves in a few locations-leaving them vulnerable to being taken over bY governments.
  + Infinitely smaller fraction of all payments,
  + Network of settlement
  + Credit was effectively monetized.
  + Temptation was always too strong
  + Financial wealth this secured could not only silence dissent, beat also nance propagandists to promote such ideas.
    - Gold offered no mechanism for restraining the sovereigns, and had to rely on trust in them not abusing the gold standard and the population remaining eternally vigilant against them doing So.
    - Civilized human living itself rests on the integrity of money providing a solid foundation
    - Mises himself well understood:
    - The nationalists are fighting the gold standard because theY want to their countries from the world market and to establish national utarky as far as possible. In
      * The most fanatical attacks against gold are made by those intent upon credit expansion. With them credit expansion is the those intent upon credit expansion.
      * One cannot make all people richer by printing money.
      * Inspired by the superstition that omnipotent governments can create wealth out of little scraps of paper national autarky for free trade, for peace, totalitarian government omnipotence for liberty. 15.
* The Twentieth Century began Governments bringing their citizens’ gold under their control through the invention of the modern central bank on the gold standard.
  + World War I started, the centralization of these reserves allowed the government to expand the money supply beyond their gold reserves, reducing the value of their currency
    - In 1971, central banks continued to hold significant gold
    - As central banks repeatedly declared the end of gold’s monetary role, their actions in maintaining their gold reserves ring truer.

## Chapter 4 - Government Money

* The beginning: of the era of government money.
* Monetary policy shape the monetary reality of the world more than any aspect of individual choice.
  + Common name for government money is fiat money,
    - From the The common name for government money
      * Difference between government money redeemable in gold, and irredeemable government money, even if both are run by the government.
    - Government has no control over supply of gold in the economy, and people are able to redeem their the supply of gold in the economy, and people are able to redeem their paper in physical gold at any time
    - Government’s debt and/or paper is used as money, and the government is able to increase its supply as it sees fit.
    - Fiat money has come into circulation solely through government fiat; they were all originally redeemable in gold or silver, or currencies that were redeemable in gold or silver.
    - Majority of countries maintain some gold in their reserves, and those countries which do not have gold reserves maintain reserves in the form of other countries fiat currencies, which are in turn backed bY gold reserves.
      * It was not government that decreed gold as money; rather, it is only by holding gold that governments could get their money to be accepted at all.
* Government moneys and commodities other than gold,
  + Liable to having its suppl? Increased quickly compared to its stock, leading to a quick loss of salability, destruction of purchasing power, and impoverishment of its holders.

### Monetary Nationalism and the End of the Free World

* There was a sense that this would be a limited conflict. Their troops. 1 nere was a> cross Europe, a new generation of Europeans had not grown to appreciate the likely consequences of war
  + Today, historians still { to offer a convincing strategic or geopolitical explanation for why a conflict between the Austro-Hungarian Empire and Serbian separatists was rigger a global war that claimed the lives of millions and
    - drastically reshaped most of the world’s borders,
* Ease with which a government could issue more paper currency was too tempting in the heat of the conflict,and far easier than demanding taxation from the citizens.
* Extended virtually to the entire wealth of the population.
  + Government only had its own treasuries
* Resort to taxation instead of inflation,
  + Not willing to part with its wealth to defend their regime’s survival
  + Financing was not enough to end the war
  + European countries devaluing their currency allowed the bloody stalemate to continue for four Years, with no resolution or advance men
    - Unbounded vanity and ambition of monarchs
    - Major national exchange rates vs. Swiss Francdur - ing WWI,
      * Until the United States was to intervene in 1917 and swing the war in favor of one party at the expense of the other by bringing in large amount of resources with which their enemies could no longer up
* After the dust settled, the currencies of all major European powers had declined in real value. The losing powers, Germany and Austria, had their average currency value in November 1918 drop to 51% and 31 % of their value in 1913.
  + Italy’s currency witnessed a drop to 77% of its original value while France’s dropped only to 91%, the UKs to 93%, the U.S. currency only to 96% of its original value,
* The major adjustment of the war was the removal of many European monarchies and their replacement with republican regimes,
* Internationally suspended or severely restricted in the major economies, governments could maintain the facade of t The currency s value remai ning its prewar peg to gold,
  + The gold standard was no longer functional.
  + How to revalue their currencies compared to gold. A
  + Hugely unpopular admission of th e depreciation that the currency inderwent, A return to the old rates of exchange would cause citizens t 1and holding gold rather than the ubiquitous paper receipts, and lead the flight of gold outside the country to where it was fairly valued.
  + Politically controlled economic decision.
    - Instead of market participant choosing the most salable good as a medium of exchange, the
    - Monetary Nationalism I mean the doctrine that a country’s share in world’s supply of money should not be left to be determined boy the principles and the same mechanism as those which determine the relative amounts of money in its different regions or localities.
    - International Monetary System would be one where the whole world possessed a homogeneous currency such as obtains within separate countries and where its flow between regions was left to be determined the results of the action of all individuals
* Introduction of Bitcoin, as a currency native to the Internet superseding; national borders and outside the realm of governmental control, offers an intriguing possibility for the emergence of a new international monetary system, to

### The Interwar Era

* Exchange rate between them, was to be determined international agreements and meetings.
* Germany suffered from hYperinflation after the Treaty of Versailles had imposed large reparations on it it sought to repay them using inflation.
* 1922 Treaty of Genoa. Under
  + Dollar the British pound were to be considered reserve currencies similar gold in their position in other countries’ reserves.
  + Hoped to alleviate its problems with the overvalued ster
  + Toward inflationism as a solution to economic problems. The insanity of this arrangement was that these governments wanted to inflate while also maintaining the price prewar levels.
  + Did not and could not work and gold continued to flow out of Britain to the United States and France.
    - The drain of gold from Britain is a little-known story with enormous consequences. Liaquat Ahamed’s Lords of Finance focuses on this
      * Adopts the reigning Keynesian understand. Ing of the issue, putting the blame for the entire episode on the gold standard.
      * Ahamed fails to comprehend that the problem was not the gold standard, but that post-World I governments had wanted to return to the gold standard at the pre-World War I rates.
        + At new rates, there would have probably been a recessionary crash, after which the economy would have recovered on a sound monetary basis.
* Murray Rothbard’s America’s Great Depression. As
  + Chief of the Bank of England, Sir Montagu Norman, leaned heavon his French, German, and American counterparts to increase the money supply in their countries, devaluing their paper currencies in the
  + Benjamin Strong, chairman of the New York Federal Reserve, was, and he engaged in Inflationary monetary policy throughout the 1920s.
    - This may have succeeded in reducing the outflow of gold from Britain up to a point, but most important implication of it was that it created a larger bubble housing and stock markets in the United States.
  + The end of 1928, at which point the U.S. economy was ripe for the inevitable collapse that follows from the suspension of inflationism.
    - The 1929 stock market crash,
  + Depression in modern recorded history.
  + Hoover chose to remain inactive in the face of the downturn, Que to misplaced faith in the ability of free markets to bring about recovand adherence to the gold standard.
    - Franklin Delano Roosevelt, suspended the gold standard, did the US. recovery ensue.
    - Hoover not only increased governspending on public work projects to fight the Depression, but also leaned on the Federal Reserve to expand credit, and
    - Of his policy the insane quest to keep wages high in the face of clining wage rates.
    - Price controls were instituted to keep rices of products, particularly agricultural, at high levels, sim
      * Protective trade policies
* 1932 U.S. general election, Hoover ran on a highly interventionist platform while Franklin Delano Roosevelt ran on a platform of fiscal and monetary responsibility. Americans had actually voted against Hoover’s policies, but when FDR got into power, he found it more convenient to play along with the interests that had influenced Hoover, and as a result, the interventionist policies of Hoover were amplified into what came to be known as the New Deal. 1
  + Price controls are always counterproductive
  + Delusion that the dollar had still maintained its value compared to gold. The inflation of the 1920s had caused large asset bubble to form in the housing and stock markets, causing an artificial rise rages and prices.
    - After the bubble burst, market prices sought readjust nent via a drop in the value of the dollar compared to gold, and a drop real wages and prices.
    - Deluded central planners who wanted to prevent all three from taking place paralyzed the economy: the dollar, wages, and prices were overvalued,
  + Executive order banning the private ownership of Bold, forcing Americans to sell their gold to the {J S. Treasury at a rate $20.67 per ounce.
    - Then revalued to $35 per ounce, inflationism which started in 1914 with the creation of the Federal Reserve and the financing of America’s entry into World War II.
* Centrally planned and government-directed failures. As 11
  + Cultural, and educational activity. Havi
  + Conclusions that suited high time-preference politicians and totalitarian governments: the state of the economy is determined by the lever of aggregate spending
    - Shortage of spending, and the remedy is the debauching of the currency and because spending is all that matters, government must do all it can to its citizens from saving.
    - Imports drive workers out of work, so spending increases must go on domestic goods.
* Theory of aggregate production, which is the point of the following book, nevertheless can be much easier adapted to the conditions
* The Keynesian deluge, from which the world is yet to recover, had begun. Universities lost their independence and became part and parcel begun. Universities lost their independence
  + Economics stopped being an intellectual discipline focused on understanding human choices under scarcity to improve their conditions.
    - Instead it became an arm of the government, meant to direct policymakers toward the best policies Managing economic activities.
    - Notion that government management of the economy is necessary became the unquestioned starting point of all modern economic education,
    - Plays the same role that God plays in religious scriptures: an omnipresent, omniscient, ɔmnipotent force that merely needs to identify problems to satisfactorily 1 ddress them.
    - Economic freedom as the foundation of economic prosperity
    - Classical liberal were the enemies of the political regimes of the 1930s;
      * Murdered
      * And chased away from Russia, Italy, Germany, and Austria, they were fortunate to only be academically persecuted in the United States and fortuna
      * Struggled to find employment while middling bureaucrats and failed statisticians filled every university economics department with their scientism and fake certainty.
* Today government-approved economics curricula still blame the gold standard for the Great Depression.
  + Virtually uninterrupted global growth and prosperity between 1870 and 1914 suddenly stopped working in the 1930s because it wouldn’t allow governments to
  + Economists cannot explain beyond meaningless Keynesian allusions to animal spirits.
* Cause of the Great Crash of 1929 was the diversion away from the standard in uit post-wwi years, and that the deepening of the economy in the Hoover and FDR Years.
  + Neither the suspension of the gold standard nor the wartime spending did anything to alleviate the Great Depression.
* With no standard of value to allow an international price mechanism to exist, and with governments increasingly captured by statist and lationist impulses,
  + Currency manipulation emerged as a tool of trade tool of trade cy, with countries seeking to devalue their currencies in order to give their exporters an advantage.
    - Trade barriers were erected, and economic nationalism became the ethos of that era,
      * Loud populist leaders who blamed all their failures on other nations,
      * Otto Mallery’s prophecy:
        + “If soldiers are not to cross international boundaries, goods must do so. Unless the Shackles can be dropped from trade, bombs will be dropped from the sky.’&gt;8

### World War II and Bretton Woods

* Most dangerous and absurd of all Keynesian fallacies,
  + Government spending on military effort would aid economic recovery.
  + All spending is spending, in the naive economics of Keynesians, and so it matters not if that spending comes from individuals feeding their , amilies or governments murdering foreigners:
    - All reduces unemployment;
  + The war was what caused economic recovery
    - War effort meant severe shortages of output at home, resulting; in rationing and price controls.
    - Political deadlock that prevent the renewal of the statuts o th political
    - Paul Samuelson
      * The last war is inescapable-were the war to end suddenly within the
      * Greatest haste, to demobilize our armed forces, to liquidate price ontrols, to shift from astronomical deficits to even the large deficits of the thirties-then there would be ushered in the greatest period of unemployment and industrial dislocation which any economy has ever aced. 10
  + U.S. government cut its spending by astonishing 75% between1944 and 1948
    - Roughly 10 million men who were mobilized for the war came back home and were almost seamlessly absorbed into the labor force, as economic production boomed, flying in the face of all Keynesian predictions and utterly obliterating the ridiculous notion level of spending is what determines output in the economy
    - As soon as prices were allowed to adjust freely, they matching sellers and buyers, incentivizing the production of goods
      * Demanded by consumers and compensating workers for their effort. The
      * Ever-present distortions of the money supply
      * Crisis after crisis.
* Victors get to decide on the monetary systems,
  + Bretton Woods - formulating a new global trading system.
  + Planned global monetary orders,
  + Global reserve currency
    - Currencies would be convertible to dollars at fixed exchange rates, while the dollar itself would be convertible to gold at a fixed exchange
    - Reading of the situation can produce a more nuanced perspective, though hardly more flattering. The links between American progressives and Russian Communists precede the monarchy, as thoroughly detailed by British-American historian Antony Sutton. Wilsonian American monarchy, as thoroughly detailed by British-American historian Antony Sutton. \Wilsonian American progressives, who were behind the League of Nations and later the United Nations, had sought a global democratic progressive technocratic managerial world government, and sought cooperation with global forces that would be supportive
    - Postwar economic order
* American people were still prohibited from owning gold, the
  + Gold exchange window- international fixed exchange rates
    - Provisions - Allowing governments to alter these rates to address a “fundamental disequilibrium”
    - International Monetary Fund, -acted as a global coordination body between central banks with express aim of achieving stability of exchange rates and financial Hows.
      * Bretton Woods attempted to achieve through central planning what the international gold standard of the nineteenth century had achieved spontaneously.
      * Keynesian economists who viewed activist fiscal and monetary policy as a natural and important part of government policy.
        + Constant monetary and fiscal management would naturally lead to the fluctuation of the value of national currencies,

Resulting in imbalances in trade capital flows.

More goods leaving the country while holders of the currency seek to purchase foreign currencies to protect themselves from devaluation.

Devaluation would sow the seeds of more devaluation, whereas currency appreciation would lead to more appreciation,

* Initial attempt to establish an International Trade Organization failed after the U.S. Congress refused to ratify the treaty: but a replacement was sought in the General Agreement on Trade and Tariffs(GATT), commencing in 1948.
  + Dollar would be the global currency for trade and central banks would trade through it and settle their accounts in it, obviating the need for physical movement of gold. In
    - Entire world economy being run as one country U.S. Federal Reserve acting as the world’s central bank
      * No effective controls
      * No citizens could redeem
      * Only governments but that was to prove far complicated than expected. Today- each ounce of gold for which foreign central banks received $35 is worth in excess of $1,200.
* Monetary expansionism became the new global norm,
  + A remarkable position, similar to, though massively exceeding in scope, Roman Empire’s pillaging and inflating the money supply used by of the Old World.
  + French economist *Jacques Reuff coined the phrase “deficit without tears”* to describe the new economic reality that United States inhabited,
    - Where it could purchase whatever it wanted the world and finance it through debt monetized by inflating the currency that the entire world used.
* Relative fiscal restraint of the first few Years after World War II t soon gave way to the politically irresistible temptation of buying free soon gave way to tne po
  + What President Eisenhower called the Military-Industrial Complex
  + Foreign policy toward an endless series of expensive conflict
* War machine
  + The Great Society affordable housing, education, and healthcare, £=3at money allowed the American electorate to ignore the laws of economics and
    - Free lunch, or at least a perpetually discounted one,
    - Ability to disperse the costs of inflation on the rest of the world,
    - Growth in government expenditure and the national debt and a loss of the purchasing power of the dollar.
    - Political differences between parties disappear as politics no longer contains trade-offs and every candidate can champion every cause.

### Government Money’s Track Record

* Global gold market was always seeking to reflect the reality of inflationism through a higher gold price.
  + The London Gold Pool, which sought to drop the price of gold by offloading some of the gold reserves that governments onto the market.
  + Countries started trying to repatriate their gold reserves from
    - When the Germans attempted to repatriate - on August 15, 1971, President Richard Nixon announced the end dollar convertibility to gold,
      * Freed from the final constraints of the pretense of gold redemption, the US. government expanded its monetary policy in unprecedented scale, causing a large drop in the purchasing power of the dollar, and
      * Everyone and everything was blamed for the rise in prices bY the US. government and its economists, except the one actual source of the price rises, the increase in the supply the Us. dollar.
* World that was growing increasingly globalized along with advancements transportation and telecommunications, freely fluctuating exchange rates constituted what Hoppe termed “a system of partial barter.”13
  + Required utilizing more than one medium of exchange reignited the age-old problem of lack of coincidence of wants.
    - Incur conversion costs.
      * The market for foreign exchange, at $5 trillion of daily volume, exists purely as a result of this inefficiency of the absence of a single global homogeneous international currency.
* Time in human history that the entire planet had run on government money,
  + Such an idea is considered normal and unquestionable in most academic circles, it is well worth examining the soundness of this predominant of money.
    - Such an idea is considered normal and unquestionable in most academic circles, it is well worth examining the soundness of this predominant form of money.
  + It is theoretically possible to create an artificially scarce asset to endow it with a monetary role.
    - Paper monies have had a higher growth in their supply rate than gold, and as result have seen a collapse in their value compared to gold.
* Relatively stable and strong currencies of the developed countries have usually had growth rates in the single digits, but with much higher variance, including contractions of the supply during deflationary recession.
  + Consumable commodities, leading disastrous hyperinflation
  + The World ries for the period between 1960 and 2015. The
    - Average growth of moray supply is 32.16% per year per country.
    - Table 3 The Ten Countries with Highest Average Annual Broad Money Supply Growth, 1960-2015
* Global demand for a store of value
  + Currencies that are most accepted worldwide have the highest salabilicy globally, have a higher stock-to-fcw rat
  + 1970s and 1980s, which contained the begin of the floating national currencies era, was one in which most countries experienced high inflation.
  + Developed economies have had slower increases in the supply of their currencies than developing economies,
    - Faster price rises and several hyperinflationary episodes
    - Sometimes triple digits, sometimes even quadruple digits,
    - Growth at 5% per Year may not sound like much, but it will double the money supply of a country in only 15 Years.
* Hyperinflation is a form of economic disaster unique to Government money.
  + “Ost production tends to ze
  + All of its savings in the form of money disappear in of a few months or even weeks. Loss of a lot of economic value by a lot of people
    - Breakdown of the structure
    - Built up over centuries and millennia.
      * Impossible to trade, produce, or engage in thing other than scraping for the bare essentials of life. As th
      * despair begins to turn to anger,
      * Opportunistic politicians take advantage of this situation, s toke people’s anger to gain power.
* It is Venezuela’s turn to go through this 1s a process that has occurred 56 times since th, and of World
  + Ongoing -
  + A process that has occurred 56 times since the end of World War 1,
  + Steve Hanke and Charles Bushnell, who define Yyperinflation as a SQ9% increase in the price level over a period of a month.
    - One of which occurred before the en monetary nationalism, and that was the inflation in France in 1795, 1n the wake of the Mississippi Bubble, Government money and engineered by the honorary father of modern government money, John Law.
    - Only political constraint provide hardness, and there are no physical, economic, or natural constraints on how much money government can produce.
      * Government will always find a reason and a way to print more money,
        + Termed the Cantillon Effect, after the Irish-French economist J ichard Cantillon, who exphined it in the eighteenth century. According to Cantillon, the beneficiaries from the expansion the money supply are the first recipients of the new money, who are able to spend it before it has caused prices to rise.

Whoever receives it from them is then able to spend it before it has caused prices to rise

As the money is spent more, the price level rises, until the later recipients suffer reduction in their real purchasing power.

Best explanation for why inflation hurts the poorest and helps richest in the modern economy

Ones who are hurt the most are those on fixed incomes or minimum wages.

* Should a currency credibly demonstrate its supply cannot be >expanded, it would immediately gain value significant.
  + Aerial bombardment destroyed the Iraqi central bank and with it the capability of the Iraqi government to print new Iraqi dinars.
    - This led to the dinar drastically appreciating overnight as Iraqis became more confident in the currency” given that central bank could print it anymore 20
    - Desirable when demonstrably scarce
* Reasons keep government money as the prime money of our rime.
  + Nandate that taxes are paid in gov
  + Ed Q in its salability
  + Mtrol and regulator o
  + Jaws make it illegal in many countries to other forms of money for payment.
  + Still backed bY gold reserves, or backed by currencies backed by US dollars,
* Gold has clearly not lost its monetary ole; it remains the only final extinguisher of debt, the one money whose value is not a liability of anyone else, and the prime global asset which carries counterparty risk.
* Alin Grenspanonce explained: “Central banks stand ready to lease gold in increasing quantities should the price ny (See Figure 4 23)
  + Problem of salability has been introduced, and that is the ability of seller to sell her good without the intervention of any third parties
    - Not issue that exists with commodity moneys, whose market value is EMergent from the market and cannot be dictated by third parties to transaction: cattle, salt, gold, and silver all have a market and willing buyer
  + November 8, 2016, to hear that their government had spended the legal tender status of 500 and 1,000 rupee notes can certainly relate
    - In the blink of an eye, what was highly salable money lost its value and had to be exchanged at banks with very long Ii
    - Vulnerable to confiscation or capital controls
* Government control of money has turned money from being the reward for producing value to the reward for obedience to government officials. It 1s impractical for anyone to develop wealth in government money without government acceptance.
  + Impose draconian taxes and punish those who avoid them
* Austrian economist Menger’s time the criteria for determining what is the best money revolved around understanding salability and what the market would choose as money, in - Austrian economist Menger’s
  + Term sound money as the money that is chosen by the market freely and the money completely under the control of the person who earned it legitimately or the free market and not any other third party.
  + Ludwig von Mises understood that this monetary role was not something inherent or intrinsic to gold.
  + Value does not exist outside of human consciousness, arad that metals and substance had nothing inherent to them that could assign to them a monetary role
    - The Theory of Money and Credit
      * The sound money principle has two aspects. It is affirmative =in approving the market’s choice of a commonly used medium of exchange. It is negative in obstructing the government’s propensity to meddle with the currency system
* European traders could pilfer African society by flooding them with cheap beads as
  + No society could prosper when such an venue for riches remained open, at the cost of impoverishing those seek productive avenues for wealth.
    - Sound money: 1akes service valuable others the only avenue open for prosperity to anyone, thus concentrating society’s efforts on production, operation, capital accumulation, and trade.
* Threat of violence -
  + Government increasing its meddling in all aspects of life, it increasingly controlled the educational system and used it to imprint in people’s minds the fanciful notion that the rules of economics did not apply to Governments,
  + Cranks like John Maynard Keynes taught in modern universities the notion that government spending only has benefits, never Costs.
    - Always print money and so no real constraints on its spending, which it can use to achieve whichever goal the electorate sets |
* Those who worship government power and take joy in totalitarian control, such as the many totalitarian and mass-murdering regimes of twentieth century, this monetary arrangement was a godsend.
  + Those who valued human liberty, peace, and cooperation among humans, t was a depressing time with the prospects of economic reform reced
  + Returning us to monetary sanity becoming an increasingly fanciful dream
  + As Friedrich Hayek put it:
    - [do mt believe we shall ever have a good money again before we take thing out of the hands of government, that is, we can’t take at violently out of the hands of government, all we can do is by some sly roundabout way introduce something that they can’t stop 25
    - Three decades after he uttered these words, and a whole individuals worldwide have the chance to save ard transact with a new form of money: chosen fre ely on the market and out: side government control
      * Bitcoin already appears to satisfy all the requirements of Menger, Mises, and Hayek: it is a highly salable free-market option that is resistant to government meddling.

## Chapter 5 - Money and Time Preference

* Sound money chosen freely on the market for its salability, because it holds its value across time, because it can transfer effectively across space, and because it can be divided and grouped into small and large scales.
  + Supply cannot be manipulated by a coercive authority
  + incentive to think of their future, and lowers their time preference.
  + Stable unit of measurement.
  + With free trade comes peace and prosperity.
  + Essential requirement for individual freedom
    - Undue power over its subjects, power which by its very nature will attract the least worthy, and most immoral, to take its reins.
* Prime factor in determining individual tire preference, an enormously important and widely neglected aspect of individual decision making.
  + Ratio at which individuals value the present compared to the future.
  + Preference varies from one individual to another.
  + Animals that act to the satisfaction of their immediate needs as hunger and aggression.
    - Curb our instinctive and animalistic impulses,
    - Longer time horizons, for satisfaction of ever-more remote needs, and they develop the mental capacity to create goods not for immediate consumption but for the production of future goods, in other words, create capital goods.
    - Essence of investment: as humans delay immediate gratification
    - Longer processes will generate more output and superior goods. In words, investment raises the productivity of the producer.
* Dedicate an initial amount of time to that does not produce edible fish, an uncertain process, risk of failure, productivity of labor,
  + Are different from, and superior to, the ones Harry catches.
  + Time to even more capital accumulation,
  + Vs continue to live the same life he will continuously improve their quality of life over time, increasing
  + Higher levels of productivity,
  + The late 1960s. Psychologist Walter Mischel would leave children in with a piece of marshmallow or a cookie,
    - Were free to have it if they wanted, but that he will come back in minutes, and if the children had not eaten the candy. He would offer a second piece as a reward.
    - Decades later and found significant correlation between having a low time preference as measured with the marshmallow test and academic achievement, high SAT score, low body mass index, and of addiction to drugs.
    - In every course I teach, as I believe it is the single most important lesson economics ca teach to individuals, and am astounded
    - Any individuals well-being are the ones they conduct in their trade-offs with their future self.
      * Partake in a far economic transactions with other people, But u
        + Deciding to save money rather than spend it; deciding to invest in acquiring skills for future employment rather than seeking immediate employment with low pay;
        + Buying a functional and affordable car rather than getting into debt for an expensive car;
        + Working overtime rather than going out to party with friends; deciding to study the course material every week the semester rather than cramming the night before the final exam.
      * Nobody forcing the decision individual, and the prime beneficiary or loser from the consequences these choices is the individual himself
    - Stories of people who have triumphed against all odds and unfavorable circumstances stand in stark contrast to the stories of people blessed with skills talent that rewarded them handsomely: who nonetheless managed talent that rewarded them handsomely
    - Professional athletes and entertainers, gifted with talents that earn them sums of money, nevertheless die penniless as their high time prefer gets the better of them. On the other hand, many ordinary people ith no special talents work diligently and save and invest for a lifetime achieve financial security and bequeath their children a life better than one they inherited.
* People live with a purpose of making next generation’s lives better. As
  + Turn their attention toward more profound aspects of life than material well-being and the drudgery of work.
  + Social ties; undertake cultural, artistic, and literary projects; and seek to offer lasting contributions to their community and the world.
  + Civilization is not about more capital accumulation per se; rather, it is bout what capital accumulation allows humans to achieve, the flourish
    - freedom to seek higher meaning in life
* Security of people in their person and property is arguably one of the most important.
  + Prioritize spending their resources
  + The higher the taxes, the less of their income
    - Saving less for their future, because the burden of taxes more likely to reduce savings than consumption,
  + Expected future value of money. Will choose the form money most likely to hold its value over time.
    - When economic decision making is geared toward the future, it is natural that all manner of decisions are geared toward the future as well.
    - People become more peaceful and cooperative, understanding that cooperation is a far more rewarding long-term strategy Morality prioritizing the moral choices likely to cheat, lie, or steal, because short term rewards
* Government-issued money is inextricably linked to artificially lower interest rates
  + Promotes borrowing and investing. B
  + Reduce savings and increase borrowing.

### Monetary Inflation

* Throughout history: is that any person who finds a way to create the monetary medium will try to do it. T
  + More that a monetary medium restrains this drive for its creation, the better it is as medium of exchange and stable store of value.
  + Purchasing power, not its quantity,
  + Theoretically ideal money would be one whose supply is fixed, meaning nobody could produce more of it.
    - Only noncriminal way to acquire money in such a society would be to produce something of value others and exchange it with them for money.
      * Acquire more money, everyone works more and produces more, leading improving material well-being for everyone,
      * Think more of the future.
      * Improving non-material aspects of their life, including spiritual, social, and cultural endeavors.
* “The best form of money in history was the one that would cause the new supply. Of money to be the least significant compared to the existing stockpiles,
  + Alchemy has yet to prove large-scale commercial viability,
* Keynes complained about gold mining being a wasteful activity that consumed a lot of resources while adding nothing to real wealth.
  + Result of it being the metal likely to attract the least human and capi resources toward its mining and prospecting, compared to all other!
* Reality of monetary competition constantly has disadvantaged individuals and societies that invest their savings in metals other than gold while rewarding those who invest their savings in gold, because it be inflated easily and because it forces people to direct their energies from producing a monetary good and toward producing more goods and services.
  + Folly of Keynes condemning gold as money because its mining is wasteful is that it is the least wasteful of all potential metals to use as money.
    - Keynes’s “solution” to this shortcoming of gold being propose a fiat monetary standard which has ended up dedicating far human time, labor, and resources toward the management of the issuance of the money supply and the profiting from it.
* Of the fundamental laws economics is the law of diminishing marginal utility, which means that economics is the law of diminishing marginal utility, which alls um unit.
* Investment is a reward for taking; risk, but sound money, having the least risk, offers no reward.
* Commodities in the Roman empire in terms of grams of gold shows they bear remarkable similarity to prices today.
* Roy Jastram has produced a systematic study of the purchasing power of gold over the longest consistent datasets available 6 Observing English from 1560 to 1976 to analyze the change in gold’s purchasing power
* Finds gold dropping in purchasing power during the first 140 years, but then remaining relatively stable 1700 to 1914,
  + Britain primarily used gold as money, purchasing power remained relatively constant, as
  + Gold has even increased in value in
    - It is easier to keep increasing the supply of all commodities
  + Than gold, and so over time, all these other commodities will become relatively more abundant than gold, using a rise in gold’s purchasing ower over time.
  + Figure 9 the U.S. dollar was also ning value against commodities whenever it was tied to gold, but lost during the U.S. Civil War and the printing of greenbacks, period after the 1934 devaluation of the dollar and confiscation of citizen gold.
* Even the best-performing and most stable government forms money have witnessed their value decimated compared to gold, with their value currently running at around 2-3% of their value in 1971 when they were all delinked from gold.
  + This does not represent a rise in the market value of gold, but rather a drop in the value of fiat
    - Relative stability
* Figures
  + Figure 10 Major currencies priced in gold, 1971-2017.
  + Figure 11 Oil priced in U.S. dollars and ounces of gold, 186 1-2017, as multiple
* Hard money, whose supply cannot be expanded easily, will likely more stable in value than easy money because its supply is largely inelastic while societal demand for money varies little over time as time preference varies.
  + Fluctuating demand from holders as the quantity varies and its reliability as a store of value falls and rises.
  + Preserving the integrity of the monetary unit as a unit of account.
  + Variation in supply demand, it can act as a reliable signal for changes in prices of other goods and services,
* Contracts through deflationary recessions bankruptcies, while the demand for money can vary even more
  + Unpredictable in value over the long term.
* Would not need government legal tender laws to enforce it, nor would governments worldwide have had to confiscate large quantities of old

### Saving and Capital Accumulation

* Negatively incentivizes saving for the future.
* Increasing the return in the future will people consider delaying gratification.
* Increase in purchase
* express mission is to keep inflation positive, will offer little incentive holders to keep it, as they become more likely to spend it or to borrow it.
* Sound money creates an economic environment where any positive rate of return will be favorable to the investor, as the monetary unit
  + Incentives for high-return but high-risk investment
* Savings rates have been declining across the developed countries, dropping to very low levels, while personal, municipal and national debts have increased to levels which would have seemed inimaginable in the past.
  + Only Switzerland, which remained on an official gold standard until has continued to have a high savings rate, scan
  + Verage household in the West is debted by more than 100% of its annual income, while the total debt burden of the various levels of government and households exceeds by multiples
  + “Ourselves” is not one homogeneous blob but is differentiated into several generations-namely, the current ones which onsume recklessly at the expense of future ones.
    - Emotional blackmail along the
    - In reality, there is nothing new in this policy,
      * Insight that spending is all that matters, and that bY ensuring pending remains high, debts can continue to grow indefinitely can be eliminated.
* An ironic sign of the depth of modern-day economic ignorance fomented by Keynesian economics that capitalism-an economic system based on capital accumulation from saving-is blamed unleashing conspicuous consumption-the exact opposite of capital cumulation.
  + Capitalism is what happens when people drop their preference, defer immediate gratification, and invest in the future
* Keynes having studied no economics, he had no understanding of capital theory and how employment does not only have to be in final but can also be in the production of capital goods
  + Only produce final goods in the future.
  + Would observe a recession concurrently with a fall in consumer spending and increase in saving, assume the causality runs from increased savings to decreased conimption to recession.
* The only reason he was born into a rich family in rich society was that his ancestors had spent centuries accumulating pital, deferring gratification and investing in the future.
  + Like the oman emperors during the decay of the empire, he could never under the work and sacrifice needed to build his affluence and believed instead that high consumption is the cause of prosperity rather than its consequence.
* Debt is the opposite of saving. If
  + Through the reduction in capital stocks across generations, reduced productivity, and a decline in living standards.
  + Current generations may be the first in the western world since the demise of the Roman Empire (or, at least, the Industrial Revolution) to come into the orld with less capital than their parents.
  + Even the wealthy will not live within their means will instead use their wealth to allow them larger loans to finance purchases.
  + Lasting cannot be mistaken for sustainability; as
  + Systematic consumption of the capital stock of society the eating of seed crop.
* Politicians who operate over short time-horizons of a few years, trying best to get reelected. It
  + Fund their reelection campaigns at the expense of future generations.
  + As H. L. Mencken put it: “Every election is an advanced auction on stolen goods.
  + Those who wanted to make responsible decisions had the choice to do so.
    - Increasingly harder choice to make,
  + Reduction in intergenerational inheritance has reduced the strength of the family as a unit, government’s unlimited checkbook has increased its ability to direct and shape the lives of people,
    - Declining incentives for maintaining a family
    - Allowing the state to appropriate many of the essential roles that the family has played for millennia, and reducing the incentive of all
    - Losing trade for individuals who have partaken in it.
      * Satisfaction depends to a large degree on establishing intimate long-term familial bonds with a partner and children 1
      * Rates of depression and psychological diseases are rising |
      * Keynes was a libertine hedonist who wasted most his adult life engaging in sexual relationships with children, including traveling around the Mediterranean to visit children’s brothels

### Innovations: “Zero to One” versus “One to Many”

* Type of projects in which a society invests.
  + Far more likely to engage in long-term investments
* The History of Science and Technology, Bunch Hellemans COI compile a list of the 8,583 most important innovatiɛ ɔns inventions in the history
  + The number of innovations per capita peaked the nineteenth century.
  + Transformative world-changing novations-almost all came in the golden era.
* From Zero to One, Peter Thiel
  + Visionaries who create a new world bY producing the first successful example of a new technology.
    - Having “zero and most significant step in an invention, whereas the move from “one to many is a matter of scaling, marketing, and optimization. Those of
      * Enamored with the concept of progress
      * Hot and cold running water, indoor toilets, plumbing, central heating:
        + Civilized society, are the difference between life and death
      * Electricity, internal combustion engine, mass production:
        + Utilization of hydrocarbon energy
      * . Automobile, airplane, city subway, electric elevator:
        + La belle époque to thank for our cities’ streets not being litered with horse manure, and
      * Heart surgery; organ transplant; appendectomy; baby incubator;
      * Petroleum-derived chemicals, stainless steel, nitrogen-based fertilizers
      * Telephone, wireless telegraphy, voice recording, color photography, movies:

### Artistic Flourishing

* Baroque, Neoclassical, Romantic, Realistic, and post-Impressionistic schools were all financed by wealthy patrons holding sound money: a very low time preference and the patience to wait for Years even decades, the completion of masterpieces meant to survive centuries.
  + Last long enough to immortalize their names as the owners of great collections and patrons of great artists.
    - This is why Florence’s Medicis
      * Perhaps better remembered for their patronage of the arts than for their innovations in banking and finance, though the latter may be far hore consequential.
* Studios profiting from selling to man the titillation basest instincts.
* Artists worked perfecting their craft so they could produce valuable works in run. They spent years learning the intricate details and techniques
* Capabilities of others, to the astonishment of their patrons and the general public.
  + Nobody stood a chance of being called an artist without Years hard work on developing their craft.
  + Artists did not condescendingly lecture the public on what art is and why their lazy productions that took day are more profound.
  + Modern artists have replaced craft and long hours of practice with pretentiousness, shock value, indigration, and existential angst as ways to cow audiences into appreciating their art, and often added some pretense to political ideals, usually of the puerile Marxist variety, to pretend-play profundity.
    - It is clever, anner of a prank or practical joke. F most
    - Neither beauty nor longevity matters anymore, replaced with political prattling and the ability to impress bureaucrats who control the najor funding sources
      * A government-protected monopoly on artistic
      * The winners are always ones who provide the goods deemed best by the public.
* History will transform the awe into appreciation of the depth of thought, craft, and hard work that went it.
  + Have received this critical sal by janitors more discerning than the insecure nouveau riche spent millions of dollars on what the janitors threw away.
* Find less and less that can hold a candle to the past.
  + In From Dawn to Decadence, a devastating critique of modern “demotic” culture, Jacques Barzun concludes: “All that the 20C contributed and created since is refinement bY ANALYSIS or critcism by pastiche and parody.”
  + Has resonated with many of this generation because it contains a large degree of depressing truth:
    - Once one overcomes one’s inherent bias to believe in the inevitability of progress, there is no escaping the conclusion that ours is a generation that is inferior to its ancestors in culture and refinement, m the same way the Roman subjects of Diocletian, living off his inflationary spending drunk on the barbaric spectacles of the Colosseum, could not a candle to the great Romans of Caesar’s era, had to earn their aureus coins with sober hard work.

## Chapter 6 - Capitalism’s Information System

“The cause of waxes of unemployment is not ‘capitalism’ but governments denying enterprise the right to produce good money.” - Friedrich Hayek

* Primary function as a medium of exchange is
* Primitive scale, it becomes harder for individuals to make production, consumption, and trade decisions without having a fixed frame of reference with which to compare the value of different objects to one another,
  + Unit of account
* The Use of Knowledge in Society's bY Friedrich Hayek
  + In the founding of one of the most important websites on the Internet, and the largest single body of knowledge assembled in human history. Jimmy Wales, Wikipedia
    - His explanation of knowledge.
  + Economic problem is not merely the problem allocating resources and products, but more accurately: the problem of allocating them using knowledge that is not given in its totality © single individual or entity.
    - By its very nature distributed anc situated people concerned bY their individual decisions
* In a free market economic system, prices are knowledge, and the signals that communicate information.
* With the simple increase in the price, everyone involved in the copper industry around the world now has the incentive to act in a way that PET INAUSUY Around tie Wulu IW Nas the INcentive to act mn supply more while consumers demand less,
  + Depth and liquidity to get around them quickly with the least disruption.
* No matter how much objective data and knowledge the agency collect, it can never know all the dispersed knowledge that burs the decisions that each individual carries out, and that includes their preferences and valuations of objects.
* Trade allows producers to increase their living standards through specialization in the goods in which they have a om gaauive advaritap—ouds which they can produce at a lower relative cost.
  + Accurate prices expressed in a common medium of exchange

### Capital Market Socialism

* Division of labor, few get the crucial role it plays in capital accumulation
  + Allocation, for which we need to turn to the work of Mises.
  + 1922 Book Socialism -
    - Socialist systems must fail, and it was not the commonly held idea that socialism simply had an incentive problem
  + Price mechanism emerging on a free market, socialism would fail at ecocalculation, most crucially in the allocation of capital goods
  + Production involves progressively sophisticated methods of production, longer time horizons, and a larger number of intermediate goods not consumed for their own sake,
  + Sophisticated structures of production only emerge from an intricate web of individual calculations
    - Supply and demand of capital goods emerges from the interaction of the producers and consumers and their iterative decisions.
* Centralization stifles the functioning of an actual market, making sound decisions based on prices impossible.
  + people’s choices are meaningless without a price to reflect the opportunity cost involved in trade-offs
  + Scarcity is the starting point of all economics, and it is not possible to produce unlimited quantities of all inputs;
  + Even if the central planning system succeeded in managing a static economy; it is powerless to accommodate change or to allow entrepreneurship.
* In every country in the world that there is a central planning board for the most important market of all, the market for capital.
  + No third parties restrict sellers
  + No country in the world has a capital market that has these characteristics today.
  + Individuals no longer invest their savings them selves, lend them out, through various institutions, to businesses specialized in production.
* A free market for loanable funds. The quantity of these funds supplied, like all supply curves, rises as the interest rate rises. In
* A society with a lot individuals with low time preference is likely to have plenty of savings, bringing the interest rate down and providing for plenty of capital for firms to invest, generating significant economic growth For the future.
  + Austrian economist, Eugen von Böhm-Bawerk,
    - Cd that the interest rate in a nation reflected its cultural level: the higher a people’s intelligence and moral strength, the more they save and the lower rate of interest.
    - Central banks determine the interest rate and the supply of loanable funds through a variety of monetary tools, operating through their control of banking system ©
    - Setting the Federal Funds rate
      * setting the required reserve ratio, engaging in open market operations, and determining lending eligibility criteria. A
      * Expansionary monetary policy
        + Reducing
        + Lowering the required reserve ratio, ›purchasing treasuries or financial assets, which also leads to money creation; and
        + Relaxing lending eligibility criteria,

### Business Cycles and Financial Crises

* The supply of loanable funds is directed by a committee of economists under the influence of politicians, bankers, TV pundits, and sometimes, most spectacularly, military generals.
  + Similar happens, but the effects are far more devastating as they affect every sector of the economy, because capital is involved in the production every economic good
  + In the capital market, the opportunity cost of capital is forgone consumption, and the opportunity cost of consumption is forgone capital investment.
    - The interest rate is the price that regulates this relationship: as people demand more investments, the interest rate rises, Incentivizing more savers to set aside more of their money for saving
* A modern economy with a central bank is built on ignoring this fundamental trade-off and assuming that banks can finance investment with new money without consumers having to forgo consumption
* Artificially low interest rates, businesses take more debt
* To start projects than savers put aside to finance these invest more other words, the value of consumption deferred is less than the of the capital borrowed.
  + Shortage of capital is not immediately apparent, because
    - * Bank can issue enough money for the borrowers-tH
      * After all, the main perk of using unsound money.
  + Reality cannot be deceived forever.
* More more producers are bidding for fewer capital goods and resources they expect there to be, the natural outcome is a rise inn the price the capital goods during the production process.
  + Manipulation is exposed, adding to the simultaneous collapse several capital investments which suddenly become unprofitable the new capital good prices; these projects are what Mises termed
    - Malinvestments- investments that would not have been undertaken without distortions in the capital market
    - Businesses is what is referred to as a recession.
* Inevitable outcome of interest rate manipulation in the same way shortages are the inevitable outcome of price ceilings.
* A capitalist system cannot function without a free market
  + Central bank’s meddling in the capital market is the root of all recessions and all the crises which most politicians, journalists, academics, and leftist activists like to blame on capitalism.
    - Escaping the negative consequences.
    - “We now have a tiger by the tail: how long can this inflation continue? If the tiger (of inflation) is freed he will eat us up; Yet if he runs faster faster while we desperately hold on, we are still finished! I’m glad I won’t be here to see the final outcome.” -Friedrich Hayek¹ A Tiger by the Tail, P. 126.
      * Historical account of the disastrous and yet grimly hilarious consequences of price controls across history
      * Forty Centuries of Price and Wage Controls - Robert Schuettinger and Eamonn Butler.
* Centrally planned, cannot allow for the emergence of accurate price because it is by its very nature controlled.
  + Rather that by merely imposing a price-any price-they prevent market process from allowing prices to coordinate consumption and production decisions among market participants, resulting in inevitable shortages or surpluses.
* In the minds of modern economists a central bank controlling interest rates is a normal part of a modern market economy.
* Established in 1914, the U.S. Federal Reserve was in charge of a sharp contraction in reserves in 1920-21, and then the sharp bust of 1929, whose fallout lasted until the end of 1945.
  + Bust of 1929, whose fallout lasitu 21 10 nina am mun of the economy, recurring every few years and providing justification for rowing government intervention to handle their fallout.
  + The Monetary History of the United States by Milton Friedman and Anna Schwartz
    - Marshal endless facts, details, statistics, and analytical tools without once providing the unfortunate reader with an understanding of one key issue: the causes of financial crises and recessions.
    - Elaborate exercise in substituting rigor for logic. Methodically avoids ever questioning the causes of the financial crises
      * Instead inundated the reader with impressive researched data, facts, trivia, and minutiae.
      * Recessions are the result the government not responding quickly enough to a financial crisis bank run, and deflationary collapse bY increasing the money supply re-inflate the banking sector.
        + Flawed reasoning leads to suggesting even more government intervention as the solution.
        + The Austrian business cycle theory, the only cause of an economy-wide recession is the inflation of the money supply in the first place.

To see why modern economists loathe understanding logical causality so ich; it would debunk almost all their solutions.

* President at the time, Warren Harding, had a strong commitment to free markets and refused to heed the call of interventionist economists. 1
  + Malinvestments were liquidated, and the labor and cap employed in them was reallocated to new investments very quickly:
* Money supply expanded by 68.1% over the period of 1921-29 while the gold stock only expanded by 15%,16 -14 which this increase of the dollar stock, beyond the stock of gold, which is cause of the Great Depression.
* Attempting to avert the recession by pouring more liquidity into it will only exacerbate the distortions which caused the crisis in the first place.

### Sound Basis for Trade

* Physically moving a good from one location to the other was Most significant barrier to trade.
* In Europe’s descent into feudalism or in the modern world’s descent into monetary nationalism, stops beings the prerogative of the transacting individuals and starts :coming a matter of national importance,
  + Requiring the oversight of the feudal lords or governments claiming sovereignty over the trading individuals.
  + Trade came to refer to trade carried out between two individuals across borders, according to terms agreed upon by their respective governments, not by the concerned individuals!
  + Commodity with the highest stock-to-flow ratio, and hence the lowest elasticity of supply
    - Keeping its value predictable and relatively constant. Instead, the value of money oscillated along with the vagaries of monetary and fiscal policy as well as international trade.
    - Nominally under the control of governments, who could at least delude themselves into thinking they could manage them to achieve stability,
      * Complex emergent outcome of
* Modern economics has formulated “The Impossible Trinity’ ΔΙ
  + Plight of modern central bankers, which states: Government can successfully BTC achieve all three goals of having a fixed foreign exchange rate, free capital flows, and an independent monetary policy.
    - Political negotiations to recalibrate the exchange rate. There can be rational ground for determining the outcome of these negotiations international organizations,
    - » the world predominantly moved to having an independent monetary policy and free capital Hows, but floating exchange rates between currencies
      * Economists to play with their favorite tools for “managing” economies while also keeping international financial institutions and large capital owners happy
      * Arrangement is likely not to the benefit of almost everyone else,
      * Excuse for implementing popular but destructive protectionist trade policies.
* Free capital flows and free trade built on a shaky foundation of floating exchange rate quicksand, amu <ch higher percentage of the country businesses and professionals need to concern themselves with the movements of the currency
  + Dedicated resources and manpower toward studying an issue of extreme importance over they have no control.
* Size of the foreign exchange market compared to productive economic CLIvity.
  + Round 25 times as large as the economic production | takes place in the entire planet?
  + Hans-Hermann Hoppe has termed « global system of partial barter\
    - Across international borders is crippling ability of global trade to benefit people,
* In a free market for money, individuals would choose the currency They want to use
  + Would become a globally sought medium of exchange
  + Higher the salability of a good, more suitable it is or this role
  + Solving the Impossible Trinity by eliminating the need or government-control monetary policy,
  + System have a vested interest in 1t continuing, 2
    - Jobs depend on a government having access to a printing to reward them,
* Is the holy grail of economic well-being,
  + Country facing an economic slowdown can boost its GDp and employment by devaluing its currency and increasing its exports,
  + Impoverishing locals and subsidizing foreigners. Country sassets cheaper for foreigners
  + Levelopeda competitive advantage that made their products demanded £lobally
* It worked, and all countries tried it, all cumwould devalue and no single country would have an advantage over others.
* bY taking the question of supply out of the hands of governments and their economist-propagandists, would force everyone to be productive society instead of seeking to get rich through the fool’ errand of monetary manipulation,

## Chapter 7 - Sound Money and Individual Freedom

“[Governments believe that … when there is a choice between an unpopular tax and a very popular expenditure, there is away out for them—the way toward inflation. This illustrates the problem of going from the gold standard” Ludwig von Mises

* World in which individual freedom and responsibility supersede government author. Yet such was the state of the world during the pe risk of greatest human progress and freedom: government was restrained to the of protection of national borders, private property> and individual freedoms, While leaving to individuals a very large magnitude of freedom make their own choices and reap the benefits or bear the costs.

### Should Government Manage the Money Supply?

### It 1s an unquestioned starting assumption

* Political free lunches sold to gullible voters. I
* Has een used as money for thousands of Years,
  + Central banks still hold large amounts of gold continued success and growth of Bitcoin, which has achieved monetary status and gained value exceeding that of most state-backed currencies, purely due to its reliable salability in spite of no authority mindating its use as mon
  + Keynes was a failed investor and statistician
    - His most famous book, The General Theory of Employment, Mosucy, and Interest, was immediately elevated into the status of founding truths of macroeconomics.
      * Unfounded and unwarranted) assumption that the most important metric in determining the state of the economy Is the level of aggregate spending
      * Very good with grasping concept of causality and logical explanations, so he never quite bothered to explain why it is that spending levels might suddenly drop, |
      * Put bluntly, pop psychology is no substitute for capital theory
  + Seeing as it 1s hard to raise taxes during a recession, government spending would effectively translate to increasing the money supply
    - There is no point worrying about inflation, because as Keynes had “showed” (i.e., baselessly assumed) inflation only happens when spending is too high,
      * Because unemployment is high, that ans spending is too low.
      * Long run, we are all dead, »4 as Keynes’s most famous defense of high-time-preference libertine irresponsibility famously stated.
  + Complete odds reality. I
  + Unemployment kept on rising as inflation soared, destroying the theory that there is a trade-off trade-off tween these two.
  + Keynes’s ideas should have been moved from the economics textbooks and confined to the realm of academic comedy, but in a society where government controls academia very large degree, the textbooks continued to preach the Keynesian t-hat justified ever more money printing.
* Any government looks for anything that gives it more power.
  + Dare to suggest a slightly reduced role for government in the macroeconɔmy, which immediately gets them dismissed as heartless evil capitalist scum who do not care about the poor.
  + Decline in the price level, or deflation as the Monetarists and Keynesians like to call it, would result in people hoarding their money, reducing their spending, causing increases in unemploymenɩ, causing a recession.
    - Central banks must do everything possible to ensure that deflation never happens.
    - Economists and textbooks do not even consider the question of ether the money supply should be increased at all, assuming that its increase is a given and discussing how central banks need to manage this
      * Real impact of this is the widespread culture of conspicuous consumption where people live their lives to buy ever-larger quantities of crap they do not need
      * Your savings lose value over time, You might as well enjoy spending it
      * Depreciating currency causes less saving, more borrowing, more short-termism in economic production and in artistic and cultural endeavors, and perhaps most damagingly, the depletion of the soil of its nutrients, leading to ever--lower levels of nutrients in food.
* Even with a larger percentage of their income going to savings, the low-time-preference societies will end up having higher levels of consumption in the long run as well as a larger capital stock.
* Entire concept of self-control and low time preference appear counterproductive.
  + Ncept or ser-control and low tun
  + When the value of money appreciates, people are likely to more discerning with their consumption and to save far more of their
    - A currency that appreciates in incentivizes saving, as savings gain purchasing power over time.
* Investment only in projects that offer a positive real return over the rate appreciation of money, meaning that only projects expected to increase society’s capital stock will tend to get funded.
* Malinvestments-unprofitable projects and investments that only appear profitable during the period of inflation and artificially low interest rates, and whose unprofitability will be exposed soon as inflation rates drop and interest rates rise, causing the bust of the boom-and-bust cycle.
  + “The boom squanders through malinvestment scarce factors of production and reduces the stock available through overconsumption; its alleged blessings are paid by impoverishment.” 10 Ludwig von Mises, Human Action (1949), p. 575. Menressions:

### Unsound Money and Perpetual War

* Unsound money is itself a barrier to trade between countries,
* Allows it to continue fighting until it completely destroys the value of its currency to continue righting until it completely us นง
* Imagine trying to live your life in self-sufficiency. Basic survival would become a very hard task for any of us, as our time is spent efficiently and fruitlessly attempting to provide the very basics of survival to ourselves.
* Money is the medium through which trade takes place, and the only tool through munities with close personal relationships.
  + Vested interest in each other’s prosperity.
  + Terms of trade unpredictable, and making it often counterproductive to plan economic activity across borders.
* Fight each other had to tax their populations in order to finance their militari es.
  + Such a strategy could only be profitable for kings would employ their military defensively, not offensively. Defensive military action always has a stronger advantage than offensive military
    - Defender is fighting on its own soil, near its people its supply lines.
    - Protracted for adventures to enrich himself would likely face resentment from his ɔpulation and incur significant costs in
* Can help help explain why the twentieth century was the deadliest in recorded history. The
  + 2005 United Nations Human Development Report12 analyzed death from conflicts over the past five centuries, and found the twentieth century to be the deadliest.
* As soon as the tide of the battle began to turn against one of the armies, it was a logistically and economically losing battle to try to increase taxes to rearm the military and turn the tide better to try to negotiate a peace wit has few losses as possible
* Large number of firms in all advanced economies specialize in warfare as a business, and are thus reliant on perpetuating war to continue being in business.
  + United states , whose defense spending is almost equal to that of the rest of the planet combined, these industries have a vested interest in keeping the U.S. government involved in some form of military adventure or other.

### Limited versus Omnipotent Government

* Dawn to Decadence, Jacques Barzun identifies the end of World War I as crucial turning point to begin the decadence, decays and demise crucial
  + “The Great Switch,” the replacement of liberalism by liberality, the impostor claiming its mantle but in reality being its exact Opposite.
  + Liberalism triumphed on the principle that the best government is that which governs least; now for all the western nations political wisdom recast this ideal of liberty into liberality. The shift has thrown the vocabulary into disorder.
  + Government’s role to allow individuals to indulge in all their desires while protecting them from the consequences.
* Historian Élie Halévy defined the Era of Tyrannies as having begun in 1914 with World War I, when the major powers of the world shifted toward economic and intellectual nationalization.
  + The promotion of nationalism Termed “the organization of enthusiasm.”15
  + Classical liberal conception of government is only possible in a world with sound money, which act as a natural restraint against government authoritarianism an overreach.
    - Reliant on the consent of its population
    - More onerous the taxation and impositions of the government, the more likely the population is to refuse to pay taxes, make C collection costs rise significantly; or rise up against the government and replace it, whether by ballot or bullet.
    - Consumption must come after production.
* When the inflation of the money supply currency can be easily blamed on myriad factors, usually involving some previous or future governments.
  + Democracy thus becomes a mass delusion of people attempting to override the rules of economics by voting themselves a free lunch and being manipulated into violent tantrums against scapegoats whenever the bill for the free lunch arrives via against scapegoats whenever the
    - Unsound money is at the heart of the modern delusion believed by most voters and those unfortunate enough to study modern macroeconomics at the university level
      * that government actions have no opportunity costs, and that government can act with an omnipotent magic wand create the reality it wants.
      * Demand for any emotionally important good, most modern citizens live in the delusional dreamland wherein none of these have actual costs, and all that is needed for these goals to be achieved is “political will, strong leadership,” and an absence of corruption.
  + Though no politician has ever been elected by acknowledging this reality the ballot box cannot overturn the fundamental scarcity of human time.
  + Later as the ™ examples of how governments that have the prerogative to create money out of thin air have almost always abused this privilege by turning it against their own people.
  + No coincidence that when recounting the most horrific tyrants history, one finds that every single one of them operated a system government-issued money which was constantly inflated to finance government operation
    - None of these monsters ever repealed sound money in order to fund their mass murder. The destruction of sound money had come before, hailed with wonderful feel-good stories involving children, education, worker liberation, and national pride.
    - Redirecting much of society’s energy and resources the zero-sum game of who gets to rule and how. Sound
* The totalitarian central ization of capital allocation and destruction of free individual enterprise, making individuals utterly dependent on government for their basic survival, and second, the control of population quantity and quality> which meant eugenics
  + Might appeal to ivory~tower idealists who imagine it will only lead to positive outcomes, in reality this leads to destruction of the market mechanisms necessary for economic production to take place
    - Money stops functioning as an information system for production, but rather as a government loyalty ‘program.

### The Bezzle

* Why in a free market, whatever assumes a monetary role will have a reliably high stock-to-flow ratio: the new supply of the money is small compared to the overall existing supply. N 1 1 1
* For John Maynard Keynes and Milton Friedman, one of the main attractions of moving away from the gold standard was the reduction in the costs of goldmining that would ensue from switching government-issued paper moneys
  + Costs to society from a form of money whose supply can be expanded at the will of a government susceptible to democratic and special-interest politics.
    - Real cost is not in the direct cost of running: printing presses, but from all the economic activity forgone as productive resources chase after the new government-issued money rather than engage in economic production.
* A sound monetary System, any business that survives does so by offering value to society&gt; bY receiving a higher revenue for its prod than the costs it incurs for its inputs.
* Any firm that produces outputs valued at less than inputs would go out of business, its resources freed up to be used bY other, more productive firms, in what economist Joseph Schumpeter termed creative destruction.
* That they cannot survive on voluntary payments that these firms are a burden and not a productive asset for society.
* The world of fiat money, having access to the central bank’s money spigots is more important than serving customers.
* Matter the of incompetence, negligence, or failure, government agencies and employees rarely ever face real consequences. After the rationale a government agency’s existence has been removed, the agency continue operating and find itself more duties and responsibility.
* Focusing most their time on publishing mentoring s, focusing most their time unreadable research
* Enforce the standards of groupthink and politically motivated conclusions masquerading as academic rigor.
* The most popular economics textbook to the postwar era, “Economics: An Introductory Analysis”
  + Repeatedly presenting the Soviet economic model as being conducive to economic growth,
  + Predicting in the fourth edition in that the Soviet Union’s economy would overtake that of the United between 1984 and 1997
  + McConnell’s Economics: Principles, Policies Problems, as well as several other textbooks. Any student who learned learned that the et model is a more efficient way of organizing economic activity
  + Continued to be taught in the same universities, with newer editions removing the grandiose proclamations about Soviet ¡success - without questioning the rest of their economic worldview and
* Where the same pattern repeats: funding coming from government agencies is monopolized bY groups of like minded scholars sharing fundamental biases.
  + Do not get a job or funding in this system bY producing important scholarship that is productive and useful to the real world,
    - By furthering the agenda of funders.
* The debates of academia are almost entirely irrelevant to the real world, and its journals’ articles are almost never read bY anYone except the people who write them for job promotion purposes, but the government bezzle indefinitely rolls on because there is no mechanism by which government funding can ever be reduced it does not benefit anybody.
* Bankers perform two highly pivotal functions economic prosperity: the safekeeping of assets as deposits, and the matching of maturity and risk tolerance
  + Jankers make their money by taking a cut from the profits if they succeed in their job, but make no profit if they fail.
  + Only way to make maturity mismatching safe is the presence ofa lender of last resort standing ready to lend to banks case of a bank run.
  + The lack of liquidity in bank could lead to a lack of liquidity in other banks dealing with bank, creating systemic risk problems.
* See how banking has evolved into a business that generates returns without risks to bankers and simultaneously creates risks without returns for everyone else.
  + Other ostensibly private industry enjoys such an exorbitant privilege, combining highest rates of profitability in the private sector with the protection of the public sector.
  + Investor who has a loss guarantee has a free option, effectively: a license print money.
    - Making profitable investments allows them to accrue all the gains, whereas losses can be socialized
  + Economist Thomas Philippon27 has produced detailed studies of the: size of the financial sector as a percentage of GDp over the past 150 Years,
    - Less than 3% during the Years preceding World War |,
    - Collapsing during the Great Depression but growing seemingly in an unstoppable manner since the end of War II.
* Reality it continues to mushroom, not because of any fundamental and, but because it is protected from losses by 8overnment and to thrive,
* Advantage in securing centralized credit is scale, as it appears quantita less risky to lend to large-scale lenders.
* The larger the firm, the easier it is for it to secure low-interest funding
  + Where investment is financed from savings, a small mom-and-pop society where investment 1s financed nom savings, a sirau mon-ana-pop footing:
  + Explain wk. Large-scale food producers proliferate so widely around the world, as their lower interest rates allow them higher margins.
  + Bland, mass-produced junk food cannot be understood outside the &reat benefits that large scale affords to producers.
* Bezzle can appear seductive outside, thanks to the generous regular paychecks and the lack of actual work involved,
  + No such thing as a free lunch.
  + Money being handed unproductive people will attract alot of people who want to do these jobs, driving up the cost of doing these jobs in time and dignity. 2 full-time game politics,
  + No Amount of bezzle money is worth the spiritual destruction that such an environment creates in people
* If You find yourself toiling away in one of industries, where the stress of Your job centers purely on pleasing boss rather than producing something of value, and are not happy with this reality>
  + You may be relieved or frightened to realize the world doesn’t have to be this way: and Your job may not survive forever, as your government’s printing press might not continue working forever.
  + Read on, because the virtues of sound money may inspire a new world of opportunity for You.

## Chapter 8 - Digital Money

* Bitcoin presents the first truly digital solution to the problem of money and it we find a potential solution to the problems of salability, soundness, sovereignty.
  + Operated with practically no failure for the 9 Years, and if it continues to operate like this for the next 90, it will be a compelling solution to the problem of money, offering individuals sovereignty over money that is resistant to unexpected inflation while being highly salable across space, scale, and time.
  + Previous technologie: humans have employed as money—shells, salt, cattle, precious metals, and government paper—mdY appear quaint anachronisms in our modern world—abacuses next to our modern computers.
* Technological advances and realities shaped the monetary standards that people employed, and the consequences to economies and society were enormous,

### Bitcoin as Digital Cash

* Divide payment methods into two distinct non-overlapping categories;
  + 1. Cash payments,
    - Convenience of being immediate and final, and require no trust on the part of either transacting party. Delay in the execution of the payment, and no third can effectivelY intervene to stop such payments,
  + 2. Intermediated pay ments, which require a trusted third party,
    - Min drawback 1s t trust that is required in execution of the transactions, the risk of the third party being compromised, and the costs and time required for payment to be completed and cleared to allow the recipient to it
* The nature of digital objects, since the inception of computers, is that they are not scarce.
  + [hey can be reproduced endlessly. Mand as such it was impossible to make a currency out of them, because sending them will nly duplicate them.
    - electronic payment had to be carried via an intermediary because of the danger of double-spending;:
    - Solution that allowed for digital payments without having to rely on a trusted third-party intermediary. BY being the first digital object that is verifiably scarce, Bitcoin is the first example of digital cas
    - Involving extra party in your transaction inherently introduces risk, because it opens up new possibilities for theft or technical failure.
      * Leaves the parties vulnerable to surveillance
    - 1 See Nick Szabo, 2001, Trusted Third Parties Are Security Holes. Available on nakamotoinstitute.org
* The most persistent characteristics of money historically are fungibility (an y unit of money is equivalent to any other unit), and liquidity (ability of the owner to sell quickly at market price)
* Distances thanks to modern telecommunication, physical cash transactions become prohibitively impractical.
  + Third parties they had no choice but to trust.
* Satoshi Nakamoto’s motivation for Bitcoin was to create a “purely peer-to-peer form of electronic cash” that would not require trust in er-to-peer form of electronic cash that would not require trust in parties for transactions and whose supply cannot be altered by any other party.
  + Bring the desirable features of physical cash (lack of intermediaries, finality of transactions) to t
  + Network with no single point of failure, hashing, digital signatures, and proof-of-work¸2
  + Foundation of very thorough and ironclad proof and verification.
    - Every transaction has to be recorded by every member of the network so that they all share one common ledger of dances and transactions. Nodes compete to be the first to update
    - Expend processing power
      * Hard to solve but whose correct solution is easy to verify.
      * Proof-of-work (PoW) system, and only with a correct solution can a block be committed and verified by all network members.
      * Once a node solves the proof-of-work correctly and announces the transactions, other nodes the network vote for its validity and once a majority has voted to the network vote for its validity, anu to be amended to the previous one and solving the new proof-of-work
      * Crucially, the node that commits a valid block of transactions to the network receives a block reward consisting of brand-new bitcoins added the supply along with all the transaction fees paid by the people who transacting.
        + Referred to as mining, new money goes only to those who spend resources updating the ledger.
        + Altered no matter how much effort and energy is expended on proof-of-work. This is achieved through process called difficulty Proof-of-work

Makes mining new coins more profitable,

As the processing power rises, Bitcoin will raise the difficulty of the

The most reliable technology for making hard and limiting the stock-to-flow ratio from rising, and

Fundamentally different from every other money. Bitcoin is the hardest money ever invented:

* Producing wealth will go toward serving one another, not producing money, an activity with no added value to society, because any supply of money is enough to run any economy.
  + Massive increase in the price of gold will, in long run, lead to larger quantities being produced, but no matter how high the price of bitcoins rises, the supply stays the same and the safety of the network only increases
    - Asymmetry between the cost of verifying its validity
      * Electricity and processing power to record transactions,
      * Verifying the validity of the transactions is close to zero and
      * Having on the trustworthiness of \*\*\*y Bitcoin’s shared ledger c can be likened to the Rai stones of Yap Island can be likened to the Rai stones of Yap Island
      * Superiour Salability - The digital ledger is accessible by anyone worldwide with an Internet connection.
* What keeps Bitcoin nodes honest, individually, is that if they dishonest, they would be discovered immediately, making dishonesty
  + What prevents a majority from colluding to be dishonest that if they were to succeed in compromising the integrity of the dger of transactions, the entire value proposition of Bitcoin would destroyed and the bitcoin tokens’ value would collapse to
  + Ralph Merkle, inventor of the Merkle tree data structure,
    - Bitcoin is the first example of a new form of life. Lives because if any one copy is corrupted it is discarded, quickly and without any fuss or muss. It lives because it is radically transparent: anyone can see its code and see exactly what it does.
    - It can’t be changed. It can’t be argued with. It can’t be tampered with. It can’t be corrupted. It can’t be stopped. It can’t even be interrupted.
    - As long as there are people who want to use it, it’s very hard to kill, or corrupt, or stop, or interrupt.
* Help us understand the immutable nature of Bitcoin in Chapter 10,
* Miners invest electricity
  + Infrastructure that protects the network because are rewarded for it. Bitcoin users pay transaction fees and buy the coins from the miners productive and lucrative everyone involved,
  + Invent digital scarcity -
    - The first example of absolute scarcity, the only liquid commodity (digital or physical) with a set fixed quantity cannot conceivably be increased.
      * Highly salable across time. Role as a store of value.

### Supply, Value, and Transactions

* It had always been theoretically possible to produce an asset with a predictably constant or low rate of supply growth to allow it to maintain monetary role, but reality. As always, had proven far trickier than theory.
  + Governments would never allow private parties to issue their own private currencies and transgress on the main way in which government funds itself and grows. So
  + Out of monetary policy altogether
  + As time went by the supply growth rate dropped and the credibility of the network in maintaining this supply schedule has increased and continues to rise with each passing which no seri
  + Asymptotically approaching 21 million coins sometime around the Year 2140, at which point there will be no more bitcoins issued.
    - There is a real cost to the production of new bitcoins.
      * Will thus generally rise along with the market price.
      * Dividing each bitcoin into 8 digits means that supply will continue to grow at a decreasing rate until around the 2140,
      * First 20 million coins will be mined by around the year 2025, leaving 1 million coins to mined over one more century.
      * Difficulty adjustment is not a precise process but a calibration adjusts every two weeks and can overshoot or undershoot its target
        + Variance from the theoretical growth will decrease as the supply grows.
* A tremendous technological leap forward in the monetary solution to the indirect exchange problem, perhaps significant as the move from cattle and salt to gold silver.
* The tokens were strictly limited and could not be replicated helped create this initial collectible status.
* Only way for market to meet the growing demand is for the price to rise enough incentivize the holders to sell some of their coins to the newcomers.
  + From $0.000994 on October 5, 2009, in its first recorded transaction to $4,200 on October 5, 2017, an increase of 422,520,000% in years and a compound annual growth rate of 573% per year. (See
  + The bitcoin price to rise, people must hold it as a store of value, not just spend it.
* November 2017, the total market value of all the bitcoins in circulation was in the range of $110 billion, giving it a value larger than the broad money supply of the national currencies of most countries.
  + Perhaps one of the most remarkable achievements oi un J network designed bY an anonymous programmer has grown,
  + Miners have an incentive to expend electricity and processing power on honestly verifying transactions.
  + Growth in the price is a reflection of the growing use and utility
* Size of Bitcoin blocks being limited to 1 megabyte, 500,000 transactions per day is close to the upper limit that can be carried out by the Bitcoin
  + While the bitcoin value of transactions has not increased appreciably over time, the market value of these transactions in US. dollars has.
  + It is incumbent on miners to process them, and the higher the fee, the faster they are likely pick chem up.
  + With the quick rise in Bitcoin’s price in the average daily transaction fee had reached $7 by the end of November. (See Figure 18.
  + Price of bitcoin has generally risen over time, this rise been highly volatile.
* For any regular commodity; the varia in demand will affect the production decisions of producers of the commodity: an increase in demand causes them to increase their production, moderating the rise in the price and allowing them to increase profitability,
  + While a decrease in demand would cause producers to crease their supply and allow them to minimize losses.
* And the financial markets that deal wit depth of the financial institutions dealing with Bitcoin, this volatile will likely decline.
  + As long as Bitcoin continues to grow in adoption, its appreciation attracts more adopters to it, leading to fur appreciation, making this drop in volatility Further away:
  + As Bitcoin is growing, its token price will behave like that of a stock of start-up achieving very fast grow)? -&amp;
  + Should Bitcoin’s growth stop and stabilize, it would stop attracting high-risk investment flows, and become a normal monetary asset expected to appreciate slightly every year.

### Appendix to Chapter 8

* Hashing is a process that can take any stream of data as an input and transform it into a dataset of fixed size (known as a hash) using a 1-reversible mathematical formula.
  + Possible to determine the original string of data in digital signatures, proof-of-work, Merkle trees, transaction identifiers, Bitcoin dresses, and various other applications. Hash identifying a piece of data in public without revealing anything about that data, which can be used to securely and trustlessly see if multiple parties have the same data.
* Public key cryptography is a method for authentication that rely a set of mathematically related numbers: a private key, a public key, One or more signatures.
  + Ilizes public key cryptography to allow secure value exchange over an open unsecured network. Ownership that exists is through the ownership of the priv ate keys,
* Peer-to-peer network is a network structure in which all members have equal privileges and obligations toward one another.
  + There are no central coordinators can change the rules of the network. Network members share the ledger of all Bitcoin transactions.

## Chapter 9 - What Is Bitcoin Good For?

* The belief that resources are scarce and limited is a misunderstanding the nature of scarcity which is the key concept behind economics.
  + Absolute quantity o vry raw material present in earth is too large : as human beings to vn measure or comprehend, and in no way constituts a real limit to what w as humans can produce of it. Always the amount of human time that irct toward producing it, as that is the only real scarce resource (until
  + Ultimate Resource late economist Julian Simon explains
    - thing for which the term resource actually applies, is human time.
    - The real cost of a good, then, is always its opportunity cost in terms of goods forgone to produce it.
    - Because our technological advancement allows us to produce them at a lower cost in terms of our time. Not
    - If resources are to be understood as being finite, then the existing stockpiles would decline with
    - Making products and materials continuously get cheaper in terms of human labor.
* Not raw materials, but technological solutions to problems. Technology
  + By its nature both a non-excludable good (meaning that once one per invents something, all others can copy it and benefit from it)
  + Non-rival good (meaning that a person benefiting from an invention does not reduce the utility that accrues to others who use it). More humans can benefit from these ideas and copy them from one another, leading to higher productivity of human time and improving standards of living.
  + Malthusian model predict.
    - Because humans themselves the resource, and productive ideas are the driver of economic production, a larger number of humans results in more productive ideas and technologies, more production per capita, and a higher capacity sustaining larger populations.
    - Raw materials are always the product of human labor and ingenuity and thus humans are ultimate resource,
    - Human time is finite, everything else is practically infinite,
    - Any metal other than gold that was used as a monetary medium was &gt;verproduced until its price collapsed.
      * Americans recently started using their homes as a medium for save the supply of housing was increased so much that the price came crashing down
      * As monetary inflation proceeds, the large number of bubbles can be understood as speculative bets for ways to find a useful store of value.
      * Move toward government control of gold soon limited its monetary role replacing it with government-issued money, whose record has been replacing it
* Should more people demand to hold Bitcoin, the only way to meet the demand is through appreciation of existing supply. B
  + Until Bitcoin’s invention, all forms of money were unlimited in their uantity and thus imperfect in their ability to store value across time.
    - Making it arguably the best store of value humanity has ever invented.
    - Cheapest way to buy the future, because Bitcoin is the only medium guaranteed to not be debased,
    - Stock-to-flow ratio will overtake that of gold, and by 2025, it will be round double that of gold and continue to increase quickly into the future while that of gold stays roughly the same, giver
      * First time any commodity or good has achieved this.
      * More time and effort is dedicated toward useful economic production which can then be exchanged for bitcoins. As
      * Allows humans to transport value digitally without any dependence on the physical world, which allows large transfers of sums across the world
      * Best technology for saving ever invented

### Store of Value

* Bitcoin’s first and most important value proposition is in giving money.
  + Freedom which was not possible before its invention.
  + For the first time since the emergence the modern state, individuals have a clear technical solution to escape the financial clout of the governments they live under.
* In The Sovereign Individual, James Davidson and William Rees-Mogg argue that the modern nation-state, with its restrictive laws, high taxes, totalitarian impulses, has grown to a level of burdensome repression fits citizens’ freedom comparable to that of the Church in the European Middle Ages, and just as ripe for disruption.
  + Rise of machinery, the printing press, capitalism, the modern nation-state birthed the age of industrial society arad modern conceptions of citizenship.
  + “Microprocessors will subvert and destroy the nation-state” is the provocative thesis of the book. New forms of organization will emerge from information technology
  + Revolution will destroy the power of the modern state over its citizens,
  + Individuals unprecedented power and sovereignty over their own lives.
  + In the cyber-world, where virtually all human knowledge exists, readily available for individuals to access without any possibility effective government control or censorship.
  + Productive capital becomes more embodied in the individuals themselves, making the threat of violently embodied in the individuals themselves, making the inextricably linked to their consent. Individual’s mental capacities become the prime productive force society the threat of violence becomes far less effective.
  + Bitcoin, and cryptography in general, are defensive technologies that the cost of defending property and information far lower than the of attacking them.
    - It makes theft extremely expensive and uncertain, thus favors whoever wants to live in peace without aggression toward others.
    - Bitcoin offers the modern individual chance to opt out of the totalitarian, managerial, Keynesian, and socialist states.
    - Examination of the ideas of the cypherpunk movement from which it sprung. In the words of Timothy May:
      * Virtual network communities in cyberspace will produce interesting profound changes in the nature of economic and social systems.
    - Murray Rothbard. In The Ethics of Liberty
      * Libertarian anarcho-capitalism as the only logically coherent implication of the idea of free will and self-ownership:
      * The natural right of person an property that Outams un Jun basic rules: ownership of one's own self, ownership of the previously unused resources which on has occupied and transform; and ownership of all titles derived from that basic ownership-either through voluntary exchanges or voluntary gifts.
      * Call the “rules of natural ownership
      * Conditions of a universal ethic for all mankind \_7
* Bitcoin, being completely voluntary and relentlessly peaceful, offers us the monetary infrastructure for a world built purely on voluntary” cooperation,
  + Brand of anarchism is completely peaceful, providing individuals with the tools necessary for them to be free from government control and inflation.
  + The cost of on-chain Bitcoin transactions js likely to rise significantly; as discussed ahead in the section on scaling
    - making it less feasible for individuals to carry out the uncensorable m-chain transactions to get around government rules and regulations.
  + The wide adoption of Bitcoin will have a far positive effect on individual freedom, by reducing government’ ability to finance its operation through inflation. It was government

### International and Online Settlement

* The ability of any individual to run a Bitcoin node and send his own money without permission from anyone, and without having to expose his identity, is a noteworthy difference between gold and Bitcoin.
  + Pitcoin does not have to be stored on a computer; the private key to person’s bitcoin hoard is a string of characters or a string of words person remembers. [t
  + The future use of Bitcoin for small payments will likely not being carried out over the distributed ledger, as explained in the discussion on scaling throughsecond layers.
  + 3jtcoin can be sec as the new emerging reserve currency for online transactions,
    - Equivalent of banks will issue Bitcoin-backed tokens to users while keeping their hoard of Bitcoins in cold storage,
    - Audit in real time the holdings of the intermediary> and with online verification and reputation systems able to verify that no inflation is taking place
    - This would allow an infinite number of transactions to be carried out online without having to pay the high transaction for on-chain transactions
* Even at the time of writing, with Bitcoin at a relatively small level of public adoption, the majority of Bitcoin transactions are recorded on-chain, bu occur in exchanges and various types of Bitcoin-based online platforms such as gambling and casino websites,
* It has created the fastest method for final settlement f large payments across long distances and national borders. It is
* The high cost of these transactions lies primarily in the volatility of trading currencies and the problems of settlement between institutions in different countries, which necessitates the employment of several layers of intermediation,
  + Currencies and involves trust in several layers of existing situation of these
  + Bitcoin’s current capacity of around 350,000 transactions pray can allow a global network of 850 banks to ach have on daily transaction with every other bank on the network.
    - (The number of unique connections in a network equals n(n — 1)/2, where n 1s the number of nodes.)
  + Offering physical and digital bitcoin-backed monetary instruments and payment solution;
* Hal Finney, the recipient of the first Bitcoin transaction from Nakamoto, wrote this on the Bitcoin forum in 2010:
  + Bitcoin itself cannot scale to have every single financial transaction the world be broadcast to everyone and included in the block in. There needs to be a secondary level of payment systems which 1s lighter weight and more efficient. George Selgin has worked out the theory of competitive free banking in detail, and he argues that such a system would be stable, inflation resistant and self-regulating.
* Bitcoin’s ledger, whose immutability and trustlessness is far too valuable for individual consumer payments.
* Continues to appreciate significantly, it will prove the central bank more flexibility with their monetary policy an international
  + Perhaps the real case for central banks owning bitcoin 1s as insurance against the scenario of it succeeding.
* Still viewed as a quirky Internet experiment for now; but it continues to survive and appreciate over time, it will start attracting real attention from high-net-worth individuals, institutional investors, then, possibly,
  + The point at which central banks start consider using it is the point at which they are all engaged in a reverse bank run on Bitc
  + Has the institutional capacity to purchase the currency without announcing it, that would be an even wiser course of action, allowing the central bank to accumulate it at low prices.
* Serve as a useful reserve asset for central banks facing international restrictions
* While central banks have mostly been dismissive of the importance Bitcoin, this could be a luxury they may not afford for long Ms Central banks now have no way of stopping now up against a digital competitor that most likely cannot be brought under the physical world’s laws.
* The real advantage to Bitcoin lis in it being a reliable long-term store of value, and a sovereign form of money that allows individuals to conduct permissionless transactions.
* Main uses in the foreseeable future will follow from this competitive advantage, and not from its ability to or ubiquitous or cheap transactions.

### Global Unit of Account

* Since the end of the gold standard era, global trade has been hampered by the differences in currency value across different countries.
* E growth of a massive foreign exchange industry.
  + Produces little of value but an amelioration of the terrible consequences monetary nationalism.
* Is an open question whether Bitcoin could potentially play the role global unit of account for trade and economic activity.
  + Bitcoin would need to be adopted by an extremely number of people in the world, most likely indirectly: through its as a reserve currency.
  + Bitcoin constitutes less than 1% of the global money supply, large individual transactions in Bitcoin can have a large impact price small variations in demand can cause large swings in price.
  + Become a majority share of the global market, the level of demand will become far more predictable and stable, leading predictable and stable, leading to a stabilization in the value of the currency.
* Should bitcoin become only money used around the world, it will no longer have large room for growth in value.
  + Holding liquid money
  + Would vary along with the time preference of the entire world’s
  + Similar to gold under the gold standard, as
    - Gold was used as money, the steady and gradual increase in its supply meant that its value did not increase or decrease significantly: making it the perfect unit of account across space and time. Use in a multitude of industrial and ornamental applications.
      * For use in a multitude of industrial and ornamental applications. Gold’s regardless of its monetary role.
      * Should central banks sell their gold reserves, net effect will be that tons more gold will be utilized in industrial applications over the coming few years, with a small impact on gold’s we.
* Bitcoin’s strict scarcity makes it a very attractive for a store of value, and an ever-growing number of holders could
  + Tolerate the volatility for long periods of time if it is heavily skewed to the side, as has been the case so far.
  + On the other hand, the persistence of upside, as has been the case so ar. On the other hand, the persistence of volatility in bitcoin’s value will prevent it from playing the role
  + Account, at least until it has grown to many multiples of its current value
    - The world’s population today has only lived in a of volatile fiat currencies shifting against each other
  + Of volatile fiat currencies shifting against each other, the certainty of the gold standard.
    - Lack of stability Not seem like a fatal law
* Monetary status is a spontaneously emergent product of human action, not a rational product of human design.
  + Human self interest - Demand shape the outcomes of their actions, providing them incentives
  + On the History of see Adam Ferguson, An Essay smith. Rationality in From… also Vernon Smith, Rationality in Economics (New
  + To persist, adapt, change, or innovate.
  + Emerges from these complex interactions; not something that conferred through academic debate, rational planning, or government mandate.
  + An international settlement currency should be neutral to the monetary policy of different countries, which is why gold to the monetary policy of different countries, which is why

## Chapter 10 - Bitcoin Questions

### Is Bitcoin Mining a Waste?

* A public address and private key. These are analogous to an email address and its password:
  + Be presented in Quick Response (QR) code format.
  + Members (nodes), who can verify the sender has enough bitcoins fulfill it, and that he has not spent these coins on another transaction
  + Once the transaction is validated by a majority of the CPU b ~ehind the network, it is inscribed onto the common ledger sh shared by all network member:
  + Solve the double-spending problem without a trusted third part
* Block subsidy, and the process of generating the new coins has been referred to as mi sin;
  + Gets the transaction fees included by senders. The sum of the transaction fees and the block subsidy is the block reward.
* Might initially seem a wasteful use of computing and electric power, proof-of-work is essential to these operation of Bitcoin
  + People who are willing to pay the cost of the operation of the Bitcoins network for their transactions are effectively financing this electricity is being produced to satisfy consumer needs and has not been wasted,
    - Is the only method humans have invented for creating digital hard money.
      * Making the production of a digital good reliably expensive,
      * Cost of writing a block extremely high and the cost verifying its validity extremely low, almost eliminating the incentive for anyone to try to create invalid transactions.
* Can thus be understood as a technology that converts electricity to truthful records through the expenditure of processing power
  + Attaching a strong economic incentive for honesty’
  + Need to have a majority
    - Undermine the integrity of Bitcoin and devalue the rewards= they are
    - Processing power that constitutes more than 5090 of the network
    - No such attacks materialized. As
* In January 2017, the processing power behind the Bitcoin network is equivalent to that of 2 trillion consumer laptops.
  + 200,000 times larger than the world’s top 500 supercomputers combined. By
  + Become the largest single-purpose computer network in the world.
  + Application Specific Integrated Circuits (ASICs) first introduced in 2012, and their deployment has made adding processing power to the Bitcoin network more efficient, b
* Should an attacker succeed in altering the record, he would be highly unlikely to gain any economic benefit from it, as compromising the network would probably reduce the value of bitcoins
  + To destroy Bitcoin, an attacker needs to expend very large sums of money with no return at all.
  + Specialized mining has allowed for the processing power backing the network to grow to the astoundingly large size it has cached.
  + Value of its tokens is entirely dependent on the integrity of the network.
  + It is hard for people new to Bitcoin to appreciate just how many logistical and security challenges Bitcoin has had to endure over the years to arrive at where it is today.
  + Contains billions of dollars of value, but conto operate safely and reliably because it was built, from day one, to operate in a highly adversarial setting, subject to relentless attack.

### Out of Control: Why Nobody Can Change Bitcoin

* Implications has not yet been fully realized by most skeptics.
  + World’s most independent central bank.
  + It would be the most sovereign nation-state in the world .
* It is no exaggeration to say nobody controls ¢ Bitcoin, and that the only option available to people is to use it as it is not use it.
* This immutability is not a feature of the Bitcoin software, which is trivial to change for anyone with coding skills, but rather is grounded in the economics of the currency and network, and stems from the difficulty of getting every member of the network to adopt the same changes the software.
  + Network is open source software,
* Scottish philosopher Adam Ferguson called “the product human action, and of human design 2”
  + Had produced a working model the software in January 2009, the code has evolved significantly since then through the contributions of hundreds of developers as chosen thousands of users who run nodes.
  + Key to running an implementation that gets adopted has proven to be the adherence to parameters of the original design.
  + Bitcoin’s coders, then, for all their competence, cannot control Bitcoin, and are only Bitcoin coders to the extent that they provide node operators with software the node operators want to adopt.
    - Miners, too, for all of the hashing power they can marshal, also cannot control Bitcoin.
    - Would be tempting here to say that node operators control Bitcoin that is true in an abstract collective manner.
      * Each individual node is powerless to force other nodes to change their code, and that creates a strong collective bias to remain on the current consensus rules.
      * A strong incentive to remain on the consensus rules
      * Strong status-quo bias Bitcoin’s operation makes alterations to its money supply schedule, or important economic parameters, extremely difficult.
* The need for many disparate and adversarial to agree to changes whose impact they cannot fully understand, the safety and tried-and-tested familiarity of the status quo remains familiar and dependable. Bitco
  + Stable Schelling point 4
    - To switch back to the original inflation schedule. Because the point appears natural, and because they expect others to also choose this strategy Give
    - Stick to the existing set of consensus rules and avoid defecting to a new set.
  + Introducing a new version of the software that is incompatible with the rest of the network members, the result would be a fork, which effectively creates two separate currencies and networks.
* Likeliest outcome is that the two Bitcoins would trade versus other on exchanges. Should the people behind the fork hope for their to succeed, they will have to sell their coins on the old fork and hope else does the same, so that the price of it collapses and their 3c the new fork rises, thus driving all the mining power and economic to the new network,
  + Bitcoin holders only hold it because they were attracted to the automated nature of its rules and their imperviousness to” direction by third parties.
  + The value of the coins on the new network collapses. X
  + Gives the party proposing the change significant control over the future direction of Bitcoin, bitcoin holders, who are needed for this shift to succeed, are to a large extent, ideologically opposed to such group having authority over Bitcoin and are highly unlikely to support such a move.
    - Examples
      * An edit to increase the issuance rate
        + Might appeal to miners, but it would not appeal to current holders, and so they are unlikely to go
      * An edit to Increase the size of the Bitcoin
        + such a proposal. Similarly, an edit to increase the size
        + Likely benefit miners by allowing them to more transactions per block and possibly collect more transaction to maximize return on their investment in their mining equipment.
* Worry that larger blocks would cause the size of the blockchain much bigger, and thus make running a full node more expensive, hereby dropping the number of nodes in the network, making the network more centralized and thus more vulnerable to attack. The code
* Fork Bitcoin under the name of “Bitcoin Classic, which would have used the blocksize to 8 megabytes. Supporters of increasing the blocksize regrouped into Bitcoin Unlim in 2017,
  + Spent enormous’ resources to promote larger blocks
  + Finally, in August 2017, a group of programmers proposed a new of Bitcoin under the name of “Bitcoin Cash,” which included many earlier advocates of increasing the block size.
    - The fate of Bitcoin Cash is a vivid illustration of the problems with a Bitcoin fork that does ot have consensus support.
    - This problem is unique to a-chain breaking off
    - Bitcoin stalwarts have learned to shrug such attempts, realizing that no matter how much hype is generated,. Attempt to change the consensus rules of Bitcoin will lead to the generation of yet another Bitcoin copycat, like the altcoins, which copy Bitcoin’s incidental details but do not have its only important characteristic: immutability.
      * Clear that Bitcoin’s advantages Clie not in its speed, convenience, or friendly user experience. Bitcoin’s value comes from it having immutable monetary policy precisely because nobody can easily change it. /
      * Changing Bitcoin in any meaningful way is not really possible, and should it be attempted, will produce other pointless knock-off to be added to the thousands already out there.
        + Bitcoin is to be taken as it is, accepted on its own terms an what it offers.
        + Is sovereign: it runs by its own rules, there are no outsiders who can alter these rules
        + Similar to the rotation of the earth, sun, moon, or stars, forces outside of ou

### Antifragility

* Bitcoin is an embodiment of Nassim Taleb’s idea of antifragility, which he efines aș gaining from adversity and disorder.
* Only changes, that happened so far have been operational changes that allow the netto run more efficiently, but not changes that alter the essence of coin’s operation
  + 99bitcoins.com has collected more than 200 examples of prominent articles announcing the death of Bitcoin over Years.
    - The Bitcomn obituary powerless to stop it, but they seem to have helped it gain more publicity and awaken:the public’s: curiosity to the fact that it continues operate in spite of all the hostility and bad press it gets.
  + The closing of the Silk Road unscathed, Bitcoin demonstrated that 1S far more thar? \*. Sure? Ney SN rime, and in the process it benefited the free publicity from the Silk Road media coverage.
  + While banning exchanges from trading Bitcoingouldibe view a= impediment to Bitcoin’s adoption through a reduction in 1ts liquidity,
  + It seems to have only served to reinforce Bitcoin’s value proposition=
  + Websites: dike’ localbitcoins.com exploding. It
  + Suspension of trading in China caused the opposite of the intended effect,

### Can Bitcoin Scale?

* Each Bitcoin transaction is recorded with all network nodes, are all required to keep a copy of the .entire ledger of all truuct10NS
  + This necessarily means that the cost of recording transactions will far higher shan for.any centralized solution. Which only needs one | and a few backups,
  + 1 mb = 350k transactions per day
    - Visa parity would require 800x more space
      * Completely outside the realm of possible processing power of commercially available computers now or in the foreseeable future. The
* Bitcoin to remain listributed, each node,on the network must cost something reasonable” distributed computers, and the transfer of data between the nodes has to be at scales are supported by regular consumer bandwidth.
* Transaction costs are rising, and in most likelihood, will continue to grow
  + the biggest scope for scaling Bitcoin transactions will likely come off-chain, where many simpler technology transactions will likely come off-chain, where many
* Which using extensive processing power is justified. Digital sound nine digital cash.
* For people who want to use bitcoin as a digital long-temmstore value, or for people who want to carry out important transactions without having to go through a repressive government, the high trnsfees are a price well worth paying.
* There are some potent solutions that do. Not involve creating any changes to the struc of Bitcoin, but which take advantage of the way transactions are tructured to increase the number of payments possible.
  + Coinjoin, several payments can be grouped together into transaction, allowing several inputs and outputs for only a fraction space that would have been needed otherwise. This
* Instead of the rising fees slowing Bitcoin’s adoption, all that is happening is that the less-important;transactions are being moved off-chain and the on-chain transactions are growing in importance.
* “He idea that millions, let alone billions, could use the Bitcoin network directly for carrying out their every transaction is unrealistic as would entail that every network member needs to be recording every other member’s transactions.
* While many Bitcoin purists the freedom accorded to them by being able to hold their own money and not rely on a financial institution to access it, the vast majority people would not want this freedom and prefer to not have their money under their responsibility for fear of theft or abduction.
  + Easy to forget that deposit barking a legitimate business which people have demanded for hundreds of around the world. People have happily
  + Face little risk of loss. In t makes modern society safer than
  + Is an entirely new industry and it is likely evolve significantly to provide technical solutions for storage with different degrees of safety and liquidity. What
    - Likely utilize cryptographic proof the Lightning Network, a techno racing transaction capacity
    - 2016 and 2017, as Bitcoin approached the maximum number of daily transactions, the network continued to grow, as is
    - Through an increase in the value on-chain transactions, not through a rise of their number.
      * Carried out off-chain, settled on exchanges
      * This does not represent a move away from Bitcoin’s function as cash, as is commonly believed.
      * While the **term cash** has come to denote the money used for small ›consumer transactions today, the original meaning of the term refers money that is **a bearer instrument**, whose value can be transferred directly without resort to settlement by, or liability of, third parties.
      * In the nineteenth century, the term cast referred to central bank old reserves, and cash settlement was the transfer of physical old between reserves,

### Is Bitcoin for Criminals?

* Of the very common misconceptions
  + Of these articles have been retracted, 7. But not before have imprinted the idea into the minds of many people,
* It is inaccurate to really say Bitcoin is anonymous, as it is rather pseudonymous. It is possible, though not guarantee,
  + As being as anonymous as the Internet it depends on how you hide, how well the others look. It is easy to dispose device, email address, or IP address and never use it again, but it is completely erase the trail of funds to one bitcoin address.
* For any, crime that actually has a victim, it would inadvisable for the criminal to use Bitcoin. Its
  + Addresses could be linked to real-world identities, even many after
  + Trail of payments itself » identified been the reason that many online drug dealers have been identified caught as thouLu e caught as they fell for the hype of Bitcoin as completely anonymous.
  + Permanent ledger
  + If an action has no victims, it is no crime, regardless
  + Legislate morality for others.

### How to Kill Bitcoin: A Beginners’ Guide

* Most of those unfamiliar with Bitcoin will frequently believe it is doomed because it will inevitably. Get. hacked, like everything digital seems to. Once Bitcoin’s operation is understood, it becomes that “hacking” it is not a straightforward task.
  + Computer security is a fundamentally problem, as it involves unpredictable attackers finding new of attack.
* Hacking
  + Bitcoin’s resistance to attack is rooted in three properties: its barebones 1 simplicity, the vast processing power that does nothing but ensure the safety of this very simple design, and the distributed nodes which need achieve consensus on any change for it to take effect.
    - Begin to get an idea of how overly fortified Bitcoin is
    - Operates under the working assumption that all computer nodes hostile attackers.
      * Instead of establishing trust in any network memBitcoin verifies everything they do. That process of verification, hrough proof-of-work, is what consumes large amounts of processing\_ power, and it has proven very effective because it makes Bitcoin security
      * If everyone is assumed dishonest, everyone must pay a large cost to commit transactions to the common record,
* 51% Attack
  + The 51% attack is a method of using large amounts of hashrate to generate fraudulent transactions, by spending the same coin twice, thus having of the transactions canceled and defrauding the recipient.
  + Economic incentives are heavily align against it.
  + Mining has grown to become a heavily capital-intensive industry with large investments dedicated to producing coins, miners grown to have a vested long-term interest integrity the network, as the value of their rewards depends on
  + Such an attack could also be carried out with no profit motive, but with the intention of destroying Bitcoin.
  + Attacker is at a constant disadvantage as his own purchasing of mining equipment leads to the faster of the mining processing power not controlled by him.
* Hardware Backdoors
  + Open source peer review culture also acts as a significant defense against these sorts of attacks. Given the distributed nature of the defense against these sorts of attacks. Given the distribution, costs and losses to individuals, and perhaps systemic disruptions of network, but it will be very hard to cause the network to come to standstill or to destroy demand for Bitcoin completely.
* Internet and Infrastructure Attacks
  + Can be shut down by shutting down important communications infrastructure on which Bitcoin relies, or shutting down the Internet.
    - Only conceivable scenario where this could happen would be through the sort of apocalyptic scenario after which there would be nobody left to even wonder if Bitcoin is operational or not.
* Rise in Cost of Nodes and Drop in Their Numbers
  + What keeps that move highly risky and unlikely that the number of nodes running the software is large enough that [coordination between the ms
  + The main constraint.. Individuals being able to run their own nodes is the Internet tr fork that increases the size of the bloc k cause a rise in the cost of running a node and lead to a reduction in number of operational nodes.
* The Breaking of the SHA-256 Hashing Algorithm
  + While it is certainly possible that the SHA-256 encryption may be broken, the economic incentives of network users switch from it to a stronger algorithm, and to switch together to algorithm.
* Return to Sound Money

### Altcoins

### Blockchain Technology

Bibliography

List of Figures