Chapter 1

Money

Bitcoin is the newest technology to serve the function of money—an invention leveraging the technological possibilities of the digital age to solve a problem that has persisted for all of humanity's existence: how to move economic value across time and space. In order to understand Bitcoin, one must first understand money, and to understand money, there is no alternative to the study of the function and history of money.

The simplest way for people to exchange value is to exchange valuable goods with one another. This process of *direct exchange* is referred to as barter, but is only practical in small circles with only a few goods and services produced. In a hypothetical economy of a dozen people isolated from the world, there is not much scope for specialization and trade, and it would be possible for individuals to each engage in the production of the most basic essentials of survival and exchange them among themselves directly. Barter has always existed in human society and continues to this day, but it is highly impractical and remains only in

use in exceptional circumstances, usually involving people with extensive familiarity with one another.

In a more sophisticated and larger economy, the opportunity arises for individuals to specialize in the production of more goods and to exchange them with many more people—people with whom they have no personal relationships, strangers with whom it is utterly impractical to keep a running tally of goods, services, and favors. The larger the market, the more the opportunities for specialization and exchange, but also the bigger the problem of *coincidence of wants*—what you want to acquire is produced by someone who doesn't want what you have to sell. The problem is deeper than different requirements for different goods, as there are three distinct dimensions to the problem.

First, there is the lack of coincidence in scales: what you want may not be equal in value to what you have and dividing one of them into smaller units may not be practical. Imagine wanting to sell shoes for a house; you cannot buy the house in small pieces each equivalent in value to a pair of shoes, nor does the homeowner want to own all the shoes whose value is equivalent to that of the house. Second, there is the lack of coincidence in time frames: what you want to sell may be perishable but what you want to buy is more durable and valuable, making it hard to accumulate enough of your perishable good to exchange for the durable good at one point in time. It is not easy to accumulate enough apples to be exchanged for a car at once, because they will rot before the deal can be completed. Third, there is the lack of coincidence of locations: you may want to sell a house in one place to buy a house in another location, and (most) houses aren't transportable. These three problems make direct exchange highly impractical and result in people needing to resort to performing more layers of exchange to satisfy their economic needs.

The only way around this is through *indirect exchange*: you try to find some other good that another person would want and find someone who will exchange it with you for what you want to sell. That intermediary good is a *medium of exchange*, and 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. A far more efficient solution will

naturally emerge, if only because those who chance upon it will be far more productive than those who do not: a single medium of exchange (or at most a small number of media of exchange) emerges for everyone to trade their goods for. A good that assumes the role of a widely accepted medium of exchange is called money.

Being a medium of exchange is the quintessential function that defines money—in other words, it is a good purchased not to be consumed (a consumption good), nor to be employed in the production of other goods (an investment, or capital good), but primarily for the sake of being exchanged for other goods. While investment is also meant to produce income to be exchanged for other goods, it is distinct from money in three respects: first, it offers a return, which money does not offer; second, it always involves a risk of failure, whereas money is supposed to carry the least risk; third, investments are less liquid than money, necessitating significant transaction costs every time they are to be spent. This can help us understand why there will always be demand for money, and why holding investments can never entirely replace money. Human life is lived with uncertainty as a given, and humans cannot know for sure when they will need what amount of money.[1] It is common sense, and age-old wisdom in virtually all human cultures, for individuals to want to store some portion of their wealth in the form of money, because it is the most liquid holding possible, allowing the holder to quickly liquidate if she needs to, and because it involves less risk than any investment. The price for the convenience of holding money comes in the form of the forgone consumption that could have been had with it, and in the form of the forgone returns that could have been made from investing it.

From examining such human choices in market situations, Carl Menger, the father of the Austrian school of economics and founder of marginal analysis in economics, came up with an understanding of the key property that leads to a good being adopted freely as money on the market, and that is *salability*—the ease with which a good can be

[1] See Ludwig von Mises' *Human Action,* p. 250, for a discussion of how uncertainty about the future is the key driver of demand for holding money. With no uncertainty of the future, humans could know all their incomes and expenditures ahead of time and plan them optimally so they never have to hold any cash. But as uncertainty is an inevitable part of life, people must continue to hold money so they have the ability to spend without having to know the future.

sold on the market whenever its holder desires, with the least loss in its price.[2]

There is nothing in principle that stipulates what should or should not be used as money. Any person choosing to purchase something not for its own sake, but with the aim of exchanging it for something else, is making it de facto money, and as people vary, so do their opinions on, and choices of, what constitutes money. Throughout human history, 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. People's choices are subjective, and so there is no "right" and "wrong" choice of money. There are, however, consequences to choices.

The relative salability of goods can be assessed in terms of how well they address the three facets of the problem of the lack of coincidence of wants mentioned earlier: their salability across scales, across space, and across time. A good that is salable across scales can be conveniently divided into smaller units or grouped into larger units, thus allowing the holder to sell it in whichever quantity he desires. Salability across space indicates an ease of transporting the good or carrying it along as a person travels, and this has led to good monetary media generally having high value per unit of weight. Both of these characteristics are not very hard to fulfill by a large number of goods that could potentially serve the function of money. It is the third element, salability across time, which is the most crucial.

A good's salability across time refers to its ability to hold value into the future, allowing the holder to store wealth in it, which is the second function of money: *store of value*. For a good to be salable across time it has to be immune to rot, corrosion, and other types of deterioration. It is safe to say anyone who thought he could store his wealth for the long term in fish, apples, or oranges learned the lesson the hard way, and likely had very little reason to worry about storing wealth for a while. Physical integrity through time, however, is a necessary but insufficient condition for salability across time, as it is possible for a good to lose its value significantly even if its physical condition remains unchanged.

[2]Carl Menger, "On the Origins of Money," *Economic Journal*, vol. 2 (1892): 239–255; translation by C. A. Foley.

For the good to maintain its value, it is also necessary that the supply of the good not increase too drastically during the period during which the holder owns it. A common characteristic of forms of money throughout history is the presence of some mechanism to restrain the production of new units of the good to maintain the value of the existing units. The relative difficulty of producing new monetary units determines the hardness of money: money whose supply is hard to increase is known as *hard money*, while *easy money* is money whose supply is amenable to large increases.

We can understand money's hardness through understanding two distinct quantities related to the supply of a good: (1) the *stock*, which is its existing supply, consisting of everything that has been produced in the past, minus everything that has been consumed or destroyed; and (2) the *flow*, which is the extra production that will be made in the next time period. The ratio between the stock and flow is a reliable indicator of a good's hardness as money, and how well it is suited to playing a monetary role. A good that has a low ratio of stock-to-flow is one whose existing supply can be increased drastically if people start using it as a store of value. Such a good would be unlikely to maintain value if chosen as a store of value. The higher the ratio of the stock to the flow, the more likely a good is to maintain its value over time and thus be more salable across time.[3]

If people choose a hard money, with a high stock-to-flow ratio, as a store of value, their purchasing of it to store it would increase demand for it, causing a rise in its price, which would incentivize its producers to make more of it. But because the flow is small compared to the existing supply, even a large increase in the new production is unlikely to depress the price significantly. On the other hand, if people chose to store their wealth in an easy money, with a low stock-to-flow ratio, it would be trivial for the producers of this good to create very large quantities of it that depress the price, devaluing the good, expropriating the wealth of the savers, and destroying the good's salability across time.

I like to call this the *easy money trap*: anything used as a store of value will have its supply increased, and anything whose supply can be easily

[3]Antal Fekete, *Whither Gold?* (1997). Winner of the 1996 International Currency Prize, sponsored by Bank Lips.

increased will destroy the wealth of those who used it as a store of value. The corollary to this trap is that anything that is successfully used as money will have some natural or artificial mechanism that restricts the new flow of the good into the market, maintaining its value across time. It therefore follows that for something to assume a monetary role, it has to be costly to produce, otherwise the temptation to make money on the cheap will destroy the wealth of the savers, and destroy the incentive anyone has to save in this medium.

Whenever a natural, technological, or political development resulted in quickly increasing the new supply of a monetary good, the good would lose its monetary status and be replaced by other media of exchange with a more reliably high stock-to-flow ratio, as will be discussed in the next chapter. Seashells were used as money when they were hard to find, loose cigarettes are used as money in prisons because they are hard to procure or produce, and with national currencies, the lower the rate of increase of the supply, the more likely the currency is to be held by individuals and maintain its value over time.

When modern technology made the importation and catching of seashells easy, societies that used them switched to metal or paper money, and when a government increases its currency's supply, its citizens shift to holding foreign currencies, gold, or other more reliable monetary assets. The twentieth century provided us an unfortunately enormous number of such tragic examples, particularly from developing countries. The monetary media that survived for longest are the ones that had very reliable mechanisms for restricting their supply growth—in other words, *hard money*. Competition is at all times alive between monetary media, and its outcomes are foretold through the effects of technology on the differing stock-to-flow ratio of the competitors, as will be demonstrated in the next chapter.

While people are generally free to use whichever goods they please as their media of exchange, the reality is that over time, the ones who use hard money will benefit most, by losing very little value due to the negligible new supply of their medium of exchange. Those who choose easy money will likely lose value as its supply grows quickly, bringing its market price down. Whether through prospective rational calculation, or the retrospective harsh lessons of reality, the majority of money and wealth will be concentrated with those who choose the hardest and most

salable forms of money. But the hardness and salability of goods itself is not something that is static in time. As the technological capabilities of different societies and eras have varied, so has the hardness of various forms of money, and with it their salability. 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. Hence, Austrian economists are rarely dogmatic or objectivist in their definition of sound money, defining it not as a specific good or commodity, but as whichever money emerges freely chosen on the market by the people who transact with it, not imposed on them by coercive authority, and money whose value is determined through market interaction, and not through government imposition.[4] Free-market monetary competition is ruthlessly effective at producing sound money, as it only allows those who choose the right money to maintain considerable wealth over time. There is no need for government to impose the hardest money on society; society will have uncovered it long before it concocted its government, and any governmental imposition, if it were to have any effect, would only serve to hinder the process of monetary competition.

The full individual and societal implications of hard and easy money are far more profound than mere financial loss or gain, and are a central theme of this book, discussed thoroughly in Chapters 5, 6, and 7. Those who are able to save their wealth in a good store of value are likely to plan for the future more than those who have bad stores of value. The soundness of the monetary media, in terms of its ability to hold value over time, is a key determinant of how much individuals value the present over the future, or their *time preference*, a pivotal concept in this book.

Beyond the stock-to-flow ratio, another important aspect of a monetary medium's salability is its acceptability by others. The more people accept a monetary medium, the more liquid it is, and the more likely it is to be bought and sold without too much loss. In social settings with many peer-to-peer interactions, as computing protocols demonstrate, it is natural for a few standards to emerge to dominate exchange, because the gains from joining a network grow exponentially the larger the size of the network. Hence, Facebook and a handful of social media networks

[4]Joseph Salerno, *Money: Sound and Unsound* (Ludwig von Mises Institute, 2010), pp. xiv–xv.

dominate the market, when many hundreds of almost identical networks were created and promoted. Similarly, any device that sends emails has to utilize the IMAP/POP3 protocol for receiving email, and the SMTP protocol for sending it. Many other protocols were invented, and they could be used perfectly well, but almost nobody uses them because to do so would preclude a user from interacting with almost everyone who uses email today, because they are on IMAP/POP3 and SMTP. Similarly, with money, it was inevitable that one, or a few, goods would emerge as the main medium of exchange, because the property of being exchanged easily matters the most. A medium of exchange, as mentioned before, is not acquired for its own properties, but for its salability.

Further, wide acceptance of a medium of exchange allows all prices to be expressed in its terms, which allows it to play the third function of money: *unit of account*. In an economy with no recognized medium of exchange, each good will have to be priced in terms of each other good, leading to a large number of prices, making economic calculations exceedingly difficult. In an economy with a medium of exchange, all prices of all goods are expressed in terms of the same unit of account. In this society money serves as a metric with which to measure interpersonal value; it rewards producers to the extent that they contribute value to others, and signifies to consumers how much they need to pay to obtain their desired goods. Only with a uniform medium of exchange acting as a unit of account does complex economic calculation become possible, and with it comes the possibility for specialization into complex tasks, capital accumulation, and large markets. The operation of a market economy is dependent on prices, and prices, to be accurate, are dependent on a common medium of exchange, which reflects the relative scarcity of different goods. If this is easy money, the ability of its issuer to constantly increase its quantity will prevent it from accurately reflecting opportunity costs. Every unpredictable change in the quantity of money would distort its role as a measure of interpersonal value and a conduit for economic information.

Having a single medium of exchange allows the size of the economy to grow as large as the number of people willing to use that medium of exchange. The larger the size of the economy, the larger the opportunities for gains from exchange and specialization, and perhaps more significantly, the longer and more sophisticated the structure of production

can become. Producers can specialize in producing capital goods that will only produce final consumer goods after longer intervals, which allows for more productive and superior products. In the primitive small economy, the structure of production of fish consisted of individuals going to the shore and catching fish with their bare hands, with the entire process taking a few hours from start to finish. As the economy grows, more sophisticated tools and capital goods are utilized, and the production of these tools stretches the duration of the production process significantly while also increasing its productivity. In the modern world, fish are caught with highly sophisticated boats that take years to build and are operated for decades. These boats are able to sail to seas that smaller boats cannot reach and thus produce fish that would otherwise not be available. The boats can brave inclement weather and continue production in very difficult conditions where less capital-intensive boats would be docked uselessly. 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 basic 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 unit of account to allow economic calculation of profits and losses.

The history of money's evolution has seen various goods play the role of money, with varying degrees of hardness and soundness, depending on the technological capabilities of each era. From seashells to salt, cattle, silver, gold, and gold-backed government money, ending with the current almost universal use of government-provided legal tender, every step of technological advance has allowed us to utilize a new form of money with added benefits, but, as always, new pitfalls. By examining the history of the tools and materials that have been employed in the role of money throughout history, we are able to discern the characteristics that make for good money and the ones that make for bad money. Only with this background in place can we then move on to understand how Bitcoin functions and what its role as a monetary medium is.

The next chapter examines the history of obscure artifacts and objects that have been used as money throughout history, from the Rai stones of Yap Island, to seashells in the Americas, glass beads in Africa,

and cattle and salt in antiquity. Each of these media of exchange served the function of money for a period during which it had one of the best stock-to-flow ratios available to its population, but stopped when it lost that property. Understanding how and why is essential to understanding the future evolution of money and any likely role Bitcoin will play. Chapter 3 moves to the analysis of monetary metals and how gold came to be the prime monetary metal in the world during the era of the gold standard at the end of the nineteenth century. Chapter 4 analyzes the move to government money and its track record. After the economic and social implications of different kinds of money are discussed in Chapters 5, 6, and 7, Chapter 8 introduces the invention of Bitcoin and its monetary properties.



Chapter 2

Primitive Moneys

Of all the historical forms of money I have come across, the one that most resembles the operation of Bitcoin is the ancient system based on Rai stones on Yap Island, today a part of the Federated States of Micronesia. Understanding how the large circular stones carved from limestone functioned as money will help us explain Bitcoin's operation in Chapter 8. Understanding the remarkable tale of how the Rai stones lost their monetary role is an object lesson in how money loses its monetary status once it loses its hardness.

The Rai stones that constituted money were of various sizes, rising to large circular disks with a hole in the middle that weighed up to four metric tons. They were not native to Yap, which did not contain any limestone, and all of Yap's stones were brought in from neighboring Palau or Guam. The beauty and rarity of these stones made them desirable and venerable in Yap, but procuring them was very difficult as it involved a laborious process of quarrying and then shipping them with rafts and canoes. Some of these rocks required hundreds of people to transport them, and once they arrived on Yap, they were placed in a prominent

location where everyone could see them. The owner of the stone could use it as a payment method without it having to move: all that would happen is that the owner would announce to all townsfolk that the stone's ownership has now moved to the recipient. The whole town would recognize the ownership of the stone and the recipient could then use it to make a payment whenever he so pleased. There was effectively no way of stealing the stone because its ownership was known by everybody.

For centuries, and possibly even millennia, this monetary system worked well for the Yapese. While the stones never moved, they had salability across space, as one could use them for payment anywhere on the island. The different sizes of the different stones provided some degree of salability across scales, as did the possibility of paying with fractions of a single stone. The stones' salability across time was assured for centuries by the difficulty and high cost of acquiring new stones, because they didn't exist in Yap and quarrying and shipping them from Palau was not easy. The very high cost of procuring new stones to Yap meant that the existing supply of stones was always far larger than whatever new supply could be produced at a given period of time, making it prudent to accept them as a form of payment. In other words, Rai stones had a very high stock-to-flow ratio, and no matter how desirable they were, it was not easy for anyone to inflate the supply of stones by bringing in new rocks. Or, at least, that was the case until 1871, when an Irish-American captain by the name of David O'Keefe was shipwrecked on the shores of Yap and revived by the locals.[1]

O'Keefe saw a profit opportunity in taking coconuts from the island and selling them to producers of coconut oil, but he had no means to entice the locals to work for him, because they were very content with their lives as they were, in their tropical paradise, and had no use for whatever foreign forms of money he could offer them. But O'Keefe wouldn't take no for an answer; he sailed to Hong Kong, procured a large boat and explosives, took them to Palau, where he used the explosives and modern tools to quarry several large Rai stones, and set sail to Yap to present the stones to the locals as payment for coconuts. Contrary

[1] The story of O'Keefe inspired the writing of a novel named *His Majesty O'Keefe* by Laurence Klingman and Gerald Green in 1952, which was made into a Hollywood blockbuster by the same name starring Burt Lancaster in 1954.

to what O'Keefe expected, the villagers were not keen on receiving his stones, and the village chief banned his townsfolk from working for the stones, decreeing that O'Keefe's stones were not of value, because they were gathered too easily. Only the stones quarried traditionally, with the sweat and blood of the Yapese, were to be accepted in Yap. Others on 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. Today, the stones serve a more ceremonial and cultural role on the island and modern government money is the most commonly used monetary medium.

While O'Keefe's story is highly symbolic, he was but the harbinger of the inevitable demise of Rai stones' monetary role with the encroachment of modern industrial civilization on Yap and its inhabitants. As modern tools and industrial capabilities reached the region, it was inevitable that the production of the stones would become far less costly than before. There would be many O'Keefes, local and foreign, able to supply Yap with an ever-larger flow of new stones. With modern technology, the stock-to-flow ratio for Rai stones decreased drastically: it was possible to produce far more of these stones every year, significantly devaluing the island's existing stock. It became increasingly unwise for anyone to use these stones as a store of value, and thus they lost their salability across time, and with it, their function as a medium of exchange.

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

A similar story happened with the aggry beads used as money for centuries in western Africa. The history of these beads in western Africa is not entirely clear, with suggestions that they were made from meteorite stones, or passed on from Egyptian and Phoenician traders. What is known is that they were 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. They were also salable across space as they were easy

to move around. In contrast, glass beads were not expensive and had no monetary role in Europe, because the proliferation of glassmaking technology meant that if they were to be utilized as a monetary unit, their producers could flood the market with them—in other words, they had a low stock-to-flow ratio.

When European explorers and traders visited West Africa in the sixteenth century, they noticed the high value given to these beads and so started importing them in mass quantities from Europe. What followed was similar to the story of O'Keefe, but given the tiny size of the beads and the much larger size of the population, it was a slower, more covert process with bigger and more tragic consequences. Slowly but surely, Europeans were able to purchase a lot of the precious resources of Africa for the beads they acquired back home for very little.[2] European incursion into 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 them, impoverishing them by transferring their wealth to the Europeans, who could acquire the beads easily. The aggry beads later came to be known as slave beads for the role they played in fueling the slave trade of Africans to Europeans and North Americans. A one-time collapse in the value of a monetary medium is tragic, but at least it is over quickly and its holders can begin trading, saving, and calculating with a new one. But a slow drain of its monetary value over time will slowly transfer the wealth of its holders to those who can produce the medium at a low cost. This is a lesson worth remembering when we turn to the discussion of the soundness of government money in the later parts of the book.

Seashells are another monetary medium that was widely used in many places around the world, from North America to Africa and Asia. Historical accounts show that the most salable seashells were usually the ones that were scarcer and harder to find, because these would hold value more than the ones that can be found easily.[3] Native Americans and early European settlers used wampum shells extensively, for the

[2]To maximize their profits, Europeans used to fill the hulls of their boats with large quantities of these beads, which also served to stabilize the boat on its trip.

[3]Nick Szabo, *Shelling Out: The Origins of Money*. (2002) Available at http://nakamotoinstitute.org/shelling-out/

same reasons as aggry beads: they were hard to find, giving them a high stock-to-flow ratio, possibly the highest among durable goods available at the time. Seashells also shared with aggry beads the disadvantage of not being uniform units, which meant prices and ratios could not be easily measured and expressed in them uniformly, which creates large obstacles to the growth of the economy and the degree of specialization. European settlers adopted seashells as legal tender from 1636, but as more and more 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 and giving them higher salability. Further, as more advanced boats and technologies were employed to harvest seashells from the sea, their supply was very highly inflated, leading to a drop in their value and a loss of salability across time. By 1661, seashells stopped being legal tender and eventually lost all monetary role.[4]

This was not just the fate of seashell money in North America; whenever societies employing seashells had access to uniform metal coins, they adopted them and benefited from the switch. Also, the arrival of industrial civilization, with fossil-fuel-powered boats, made scouring the sea for seashells easier, increasing the flow of their production and dropping the stock-to-flow ratio quickly.

Other ancient forms of money include cattle, cherished for their nutritional value, as they were one of the most prized possessions anyone could own and were also salable across space due to their mobility. Cattle continue to play a monetary role today, with many societies using them for payments, especially for dowries. Being bulky and not easily divisible, however, meant cattle were not very useful to solve the problems of divisibility across scales, and so another form of money coexisted along with cattle, and that was salt. Salt was easy to keep for long durations and could be easily divided and grouped into whatever weight was necessary. These historical facts are still apparent in the English language, as the word *pecuniary* is derived from *pecus*, the Latin word for cattle, while the word *salary* is derived from *sal*, the Latin word for salt.[5]

[4]Ibid.

[5]Antal Fekete, *Whither Gold?* (1997). Winner of the 1996 International Currency Prize, sponsored by Bank Lips.

As technology advanced, particularly with metallurgy, humans developed superior forms of money to these artifacts, which began to quickly replace them. These metals proved a better medium of exchange than seashells, stones, beads, cattle, and salt because they could be made into uniform, highly valuable small units that could be moved around far more easily. Another nail in the coffin of artifact money came with the mass utilization of hydrocarbon fuel energy, which increased our productive capacity significantly, allowing for a quick increase in the new supply (flow) of these artifacts, meaning that the forms of money that relied on difficulty of production to protect their high stock-to-flow ratio lost it. With modern hydrocarbon fuels, Rai stones could be quarried easily, aggry beads could be made for very little cost, and seashells could be collected en masse by large boats. As soon as these monies lost their hardness, their holders suffered significant wealth expropriation and the entire fabric of their society fell apart as a result. The Yap Island chiefs who refused O'Keefe's cheap Rai stones understood what most modern economists fail to grasp: a money that is 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

As human technical capacity for the production of goods became more sophisticated, and our utilization of metals and commodities grew, many metals started getting produced at large enough quantities and were in large enough demand to make them highly salable and suited for being used as monetary media. These metals' density and relatively high value made moving them around easy, easier than salt or cattle, making them highly salable across space. The production of metals was initially not easy, making it hard to increase their supply quickly and giving them good salability across time.

Due to their durability and physical properties, as well as their relative abundance in earth, some metals were more valuable than others. Iron and 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 them. These metals developed a relatively low market value and would be used for smaller transactions. Rarer metals such as silver and gold, on the other hand, were more durable and less likely to corrode or ruin,

making them more salable across time and useful as a store of value into the future. Gold's virtual indestructibility, in particular, allowed humans to store value across generations, thus allowing us to develop a longer time horizon orientation.

Initially, metals were bought and sold in terms of their weight,[1] but over time, as metallurgy advanced, it became possible to mint them into uniform coins and brand them with their weight, making them far more salable by saving people from having to weigh and assess the metals every time. The three metals most widely used for this role were gold, silver, and copper, and their use as coins was the prime form of money for around 2,500 years, from the time of the Greek king Croesus, who was the first recorded to have minted gold coins, to the early twentieth century. Gold coins were the goods most salable across time, because they could hold their value over time and resist decay and ruin. They were also the goods most salable across space, because they carried a lot of value in small weights, allowing for easy transportation. Silver coins, on the other hand, had the advantage of being the most salable good across scales, because their lower value per weight unit compared to gold allowed for them to conveniently serve as a medium of exchange for small transactions, while bronze coins would be useful for the least valuable transactions. By standardizing values into easily identifiable units, coins allowed for the creation of large markets, increasing the scope of specialization and trade worldwide. While the best monetary system technologically possible at the time, it still had two major drawbacks: the first was that the existence of two or three metals as the monetary standard created economic problems from the fluctuation of their values over time due to the ebbs of supply and demand, and created problems for owners of these coins, particularly silver, which experienced declines in value due to increases in production and drops in demand. The second, more serious flaw was that governments and counterfeiters could, and frequently did, reduce the precious metal content in these coins, causing their value to decline by transferring a fraction of their purchasing power to the counterfeiters or the government. The reduction in the metal content of the coins compromised the purity and soundness of the money.

[1] Nick Szabo, *Shelling Out: The Origins of Money* (2002). Available at http://nakamotoinstitute.org/shelling-out/

By the nineteenth century, however, with the development of modern banking and the improvement in methods of communication, individuals could transact with paper money and checks backed by gold in the treasuries of their banks and central banks. This made gold-backed transactions possible at any scale, thus obviating the need for silver's monetary role, and gathering all essential monetary salability properties in the gold standard. The gold standard allowed for unprecedented global capital accumulation and trade by uniting the majority of the planet's economy on one sound market-based choice of money. Its tragic flaw, however, was that by centralizing the gold in the vaults of banks, and later central banks, it made it possible for banks and governments to increase the supply of money beyond the quantity of gold they held, devaluing the money and transferring part of its value from the money's legitimate holders to the governments and banks.

Why Gold?

To understand how commodity money emerges, we return in more detail to the easy money trap we first introduced in Chapter 1, and begin by 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). Any time a person chooses a good as a store of value, she is effectively increasing the demand for it beyond the regular market demand, which will cause its price to rise. For example, market demand for copper in its various industrial uses is around 20 million tons per year, at a price of around $5,000 per ton, and a total market valued around $100 billion. Imagine a billionaire deciding he would like to store $10 billion of his wealth in copper. As his bankers run around trying to buy 10% of annual global copper production, they would inevitably cause the price of copper to increase. Initially, this sounds like a vindication of the billionaire's monetary strategy: the 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.

But even if more people join him in monetizing copper, our hypothetical copper-obsessed billionaire is in trouble. The rising price makes copper a lucrative business for workers and capital across the world. The quantity of copper under the earth is beyond our ability to even measure, let alone extract through mining, so practically speaking, the only binding restraint on how much copper can be produced is how much labor and capital is dedicated to the job. More copper can always be made with a higher price, and the price and quantity will continue to rise until they satisfy the monetary investors' demand; let's assume that happens at 10 million extra tons and $10,000 per ton. At some point, monetary demand must subside, and some holders of copper will want to offload some of their stockpiles to purchase other goods, because, after all, that was the point of buying copper.

After the monetary demand subsides, all else being equal, the copper market would go back to its original supply-and-demand conditions, with 20 million annual tons selling for $5,000 each. But as the holders begin to sell their accumulated stocks of copper, the price will drop significantly below that. The billionaire will have lost money in this process; as he was driving the price up, he bought most of his stock for more than $5,000 a ton, but now his entire stock is valued below $5,000 a ton. The others who joined him later bought at even higher prices and will have lost even more money than the billionaire himself.

This model is applicable for all consumable commodities such as copper, zinc, nickel, brass, or oil, which are primarily consumed and destroyed, not stockpiled. Global stockpiles of these commodities at any moment in time are around the same order of magnitude as new annual production. New supply is constantly being generated to be consumed. Should savers decide to store their wealth in one of these commodities, their wealth will only buy a fraction of global supply before bidding the price up enough to absorb all their investment, because they are competing with the consumers of this commodity who use it productively in industry. As the revenue to the producers of the good increases, they can then invest in increasing their production, bringing the price crashing down again, robbing the savers of their wealth. The net effect of this entire episode is the transfer of the wealth of the misguided savers to the producers of the commodity they purchased.

This is the 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. Investors in the bubble are fleeced while producers of the asset benefit. For copper and almost every other commodity in the world, this dynamic has held true for most of recorded history, consistently punishing 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 not a medium of exchange.

For anything to function as a good store of value, it has to beat this trap: 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. Such an asset will reward those who choose it as their store of value, increasing their wealth in the long run as it becomes the prime store of value, because those who chose other commodities will either reverse course by copying the choice of their more successful peers, or will simply lose their wealth.

The clear winner in this race throughout human history has been gold, which maintains its monetary role due to two unique physical characteristics that differentiate it from other commodities: first, gold is so chemically stable that it is virtually impossible to destroy, and second, gold is impossible to synthesize from other materials (alchemists' claims notwithstanding) and can only be extracted from its unrefined ore, which is extremely rare in our planet.

The chemical stability of gold implies that virtually all of the gold ever mined by humans is still more or less owned by people around the world. Humanity has been accumulating an ever-growing hoard of gold in jewelry, coins, and bars, which is never consumed and never rusts or disintegrates. The impossibility of synthesizing gold from other chemicals means that the only way to increase the supply of gold is by mining gold from the earth, an expensive, toxic, and uncertain process in which humans have been engaged for thousands of years with ever-diminishing returns. This all means that the existing stockpile of gold held by people around the world is the product of thousands of years of gold production, and is orders of magnitude larger than new annual production. Over the

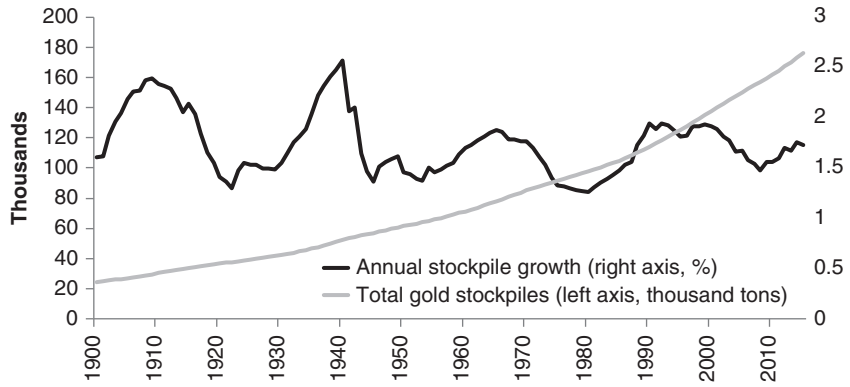

Figure 1 Global gold stockpiles and annual stockpile growth rate.

past seven decades with relatively reliable statistics, this growth rate has always been around 1.5%, never exceeding 2%. (See Figure 1.[2])

To understand the difference between gold and any consumable commodity, imagine the effect of a large increase in demand for it as a store of value that causes the price to spike and annual production to double. For any consumable commodity, this doubling of output will dwarf any existing stockpiles, bringing the price crashing down and hurting the holders. For gold, a price spike that causes a doubling of annual production will be insignificant, increasing stockpiles by 3% rather than 1.5%. If the new increased pace of production is maintained, the stockpiles grow faster, making new increases less significant. It remains practically impossible for goldminers to mine quantities of gold large enough to depress the price significantly.

Only silver comes close to gold in this regard, with an annual supply growth rate historically around 5–10%, rising to around 20% in the modern day. This is higher than that of gold for two reasons: First, silver does corrode and can be consumed in industrial processes, which means the existing stockpiles are not as large relative to annual production as gold's stockpiles are relative to its annual production. Second, silver is less rare than gold in the crust of the earth and easier to refine. Because of having the second highest stock-to-flow ratio, and its lower value per unit of

[2] *Source*: U.S. Geological Survey.

weight than gold, silver served for millennia as the main money used for smaller transactions, complementing gold, whose high value meant dividing it into smaller units, which was not very practical. The adoption of the international gold standard allowed for payments in paper backed by gold at any scale, as will be discussed in more detail later in this chapter, which obviated silver's monetary role. With silver no longer required for smaller transactions, it soon lost its monetary role and became an industrial metal, losing value compared to gold. Silver may maintain its sporting connotation for second place, but as nineteenth-century technology made payments possible without having to move the monetary unit itself, second place in monetary competition was equivalent to losing out.

This explains why the silver bubble has popped before and will pop again if it ever inflates: as soon as significant monetary investment flows into silver, it is not as difficult for producers to increase the supply significantly and bring the price crashing down, taking the savers' wealth in the process. The best-known example of the easy-money trap comes from silver itself, of all commodities. Back in the late 1970s, the very affluent Hunt brothers decided to bring about the remonetization of silver and started buying enormous quantities of silver, driving the price up. Their rationale was that as the price rose, more people would want to 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, their wealth was no match for the ability of miners and holders of silver to keep selling silver onto the market. The price of silver eventually crashed and the Hunt brothers lost over $1bn, probably the highest price ever paid for learning the importance of the stock-to-flow ratio, and why not all that glitters is gold.[3] (See Figure 2.[4])

It is this consistently low rate of supply of gold that is the fundamental reason it has maintained its monetary role throughout human history, a role it continues to hold today as central banks continue to hold significant supplies of gold to protect their paper currencies. Official central bank reserves are at around 33,000 tons, or a sixth of total

[3] "Big Bill for a Bullion Binge," *TIME*, August 29, 1989.

[4] *Source*: U.S. Geological Survey data for gold. Silver Institute data for silver, BP.com statistical review for oil. Author's estimates from various media sources for copper.

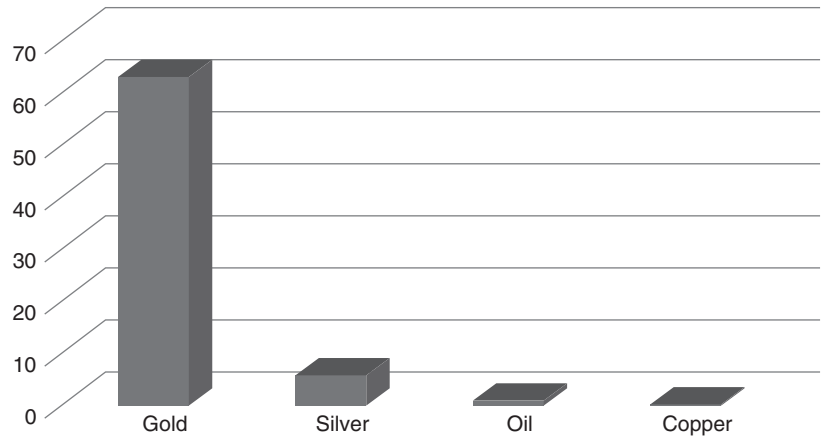

Figure 2 Existing stockpiles as a multiple of annual production.

above-ground gold. The high stock-to-flow ratio of gold makes it the commodity with the lowest *price elasticity of supply*, which is defined as the percentage increase in quantity supplied over the percentage increase in price. Given that the existing supply of gold held by people everywhere is the product of thousands of years of production, an *X*% increase in price may cause an increase in new mining production, but that increase will be trivial compared to existing stockpiles. For instance, the year 2006 witnessed a 36% rise in the spot price of gold. For any other commodity, this would be expected to increase mining output significantly to flood markets and bring the price down. Instead, annual production in 2006 was 2,370 tons, 100 tons less than in 2005, and it would drop a further 10 tons in 2007. Whereas the new supply was 1.67% of existing stockpiles in 2005, it was 1.58% of existing stockpiles in 2006, and 1.54% of existing stockpiles in 2007. Even a 35% rise in price can lead to no appreciable increase in the supply of new gold onto the market. According to the U.S. Geological Survey, the single biggest annual increase in production was around 15% in the year 1923, which translated to an increase in stockpiles around only 1.5%. Even if production were to double, the likely increase in stockpiles would only be around 3–4%. The highest annual increase in global stockpiles happened in 1940, when stockpiles rose by around 2.6%. Not once has the annual stockpile growth exceeded that number, and not once since 1942 has it exceeded 2%.

As the production of metals began to proliferate, ancient civilizations in China, India, and Egypt began to use copper, and later silver, as money, as these two were relatively hard to manufacture at the time and allowed for good salability across time and space. Gold was highly prized in these civilizations, but its rarity meant its salability for transactions was limited. It was in Greece, the birthplace of modern civilization, where gold was first minted into regular coins for trade, under King Croesus. This invigorated global trade as gold's global appeal saw the coin spread far and wide. Since then, the turns of human history have been closely intertwined with the soundness of money. Human civilization flourished in times and places where sound money was widely adopted, while unsound money all too frequently coincided with civilizational decline and societal collapse.

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 coins were becoming more widespread. Julius Caesar, the last dictator of the Roman Republic, created the aureus coin, which contained around 8 grams of gold and was widely accepted across Europe and the Mediterranean, increasing the scope of trade and specialization in the Old World. Economic stability reigned for 75 years, even through the political upheaval of his assassination, which saw the Republic transformed into an Empire under his chosen successor, Augustus. This continued until the reign of the infamous emperor Nero, who was the first to engage in the Roman habit of "coin clipping," wherein the Emperor would collect the coins of the population and mint them into newer coins with less gold or silver content.

For as long as Rome could conquer new lands with significant wealth, its soldiers and emperors could enjoy spending their loot, and emperors even decided to buy themselves popularity by mandating artificially low prices of grains and other staples, sometimes even granting them for free. Instead of working for a living in the countryside, many peasants would leave their farms to move to Rome,

where they could live better lives for free. With time, the Old World 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. Nero, who ruled from 54–68 AD, had found the formula to solve this, which was highly similar to Keynes's solution to Britain's and the U.S.'s problems after World War I: devaluing the currency would at once reduce the real wages of workers, reduce the burden of the government in subsidizing staples, and provide increased money for financing other government expenditure.

The aureus coin was reduced from 8 to 7.2 grams, while the denarius's silver content was reduced from 3.9 to 3.41g. This provided some temporary relief, but had set in motion the highly destructive self-reinforcing cycle of popular anger, price controls, coin debasement, and price rises, following one another with the predictable regularity of the four seasons.[5]

Under the reign of Caracalla (AD 211–217), the gold content was further reduced to 6.5 grams, and under Diocletian (AD 284–305) it was further reduced to 5.5g, before he introduced a replacement coin called the solidus, with only 4.5 grams of gold. On Diocletian's watch, the denarius only had traces of silver to cover its bronze core, and the silver would disappear quite quickly with wear and tear, ending the denarius as a silver coin. As inflationism intensified in the third and fourth centuries, with it came the misguided attempts of the emperors to hide their inflation by placing price controls on basic goods. As market forces sought to adjust prices upward in response to the debasement of the currency, price ceilings prevented these price adjustments, making it unprofitable for producers to engage in production. Economic production would come to a standstill until a new edict allowed for the liberalization of prices upward.

With this fall in the value of its money, the long process of terminal decline of the empire resulted in a cycle that might appear familiar to modern readers: coin clipping reduced the aureus's real value, increasing

[5]See Schuettinger and Butler's highly entertaining *Forty Centuries of Wage and Price Controls*.

the money supply, allowing the emperor to continue imprudent overspending, but eventually resulting in inflation and economic crises, which the misguided emperors would attempt to ameliorate via further coin clipping. Ferdinand Lips summarizes this process with a lesson to modern readers:

> It should be of interest to modern Keynesian economists, as well as to 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 unreliable and debased, speculation in commodities became far more attractive than producing them.[6]

The long-term consequences for the Roman Empire were devastating. Although Rome up until the second century AD may not be characterized as a full-fledged free market capitalist economy, because it still had plenty of government restraints on economic activity, with the aureus it nonetheless established what was then the largest market in human history with the largest and most productive division of labor the world had ever known.[7] Citizens of Rome and the major cities obtained their basic necessities by trade with the far-flung corners of the empire, and this helps explain the growth in prosperity, and the devastating collapse the empire suffered when this division of labor fell apart. As taxes increased and inflation made price controls unworkable, the urbanites of the cities started fleeing to empty plots of land where they could at least have a chance of living in self-sufficiency, where their lack of income spared them having to pay taxes. The intricate civilizational edifice of the Roman Empire and the large division of labor across Europe and the Mediterranean began to crumble, and its descendants became self-sufficient peasants scattered in isolation and would soon turn into serfs living under feudal lords.

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[6]Ferdinand Lips, *Gold Wars: The Battle Against Sound Money as Seen from a Swiss Perspective* (New York: Foundation for the Advancement of Monetary Education, 2001).

[7]Ludwig von Mises, *Human Action: The Scholar's Edition* (Auburn, AL: Ludwig von Mises Institute, 1998).

Byzantium and the Bezant

The emperor Diocletian has forever had his name associated with fiscal and monetary chicanery, and the Empire reached a nadir under his rule. A year after he abdicated, however, Constantine the Great took over the reins of the empire and reversed its fortunes by adopting economically responsible polices and reforms. Constantine, who was the first Christian emperor, committed to maintaining the solidus at 4.5 grams of gold without clipping or debasement and started minting it in large quantities in 312 AD. He moved east and established Constantinople at the meeting point of Asia and Europe, birthing the Eastern Roman Empire, which took the solidus as its coin. While Rome continued its economic, social, and cultural deterioration, finally collapsing in 476 AD, Byzantium survived for 1,123 years while the solidus became the longest-serving sound currency in human history.

The legacy of Constantine in maintaining the integrity of the solidus made it the world's most recognizable and widely accepted currency, and it came to be known as the *bezant*. While Rome burned under bankrupt emperors who could no longer afford to pay their soldiers as their currencies collapsed, Constantinople thrived and prospered for many more centuries with fiscal and monetary responsibility. While the Vandals and the Visigoths ran rampage in Rome, Constantinople remained prosperous and free from invasion for centuries. As with Rome, the fall of Constantinople happened only after its rulers had started devaluing the currency, a process that historians believe began in the reign of Constantine IX Monomachos (1042–1055).[8] Along with monetary decline came the fiscal, military, cultural, and spiritual decline of the Empire, as it trudged on with increasing crises until it was overtaken by the Ottomans in 1453.

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. As Islam rose during the golden age of Byzantium, the bezant and coins similar to it in weight and size

[8]David Luscombe and Jonathan Riley-Smith, *The New Cambridge Medieval History: Volume 4, C.1024–1198* (Cambridge University Press, 2004), p. 255.

were circulating in the regions to which Islam had spread. The Umayyad Caliph Abdul-Malik ibn Marwan defined the weight and value of the Islamic dinar and imprinted it with the Islamic *shahada* creed in 697 AD. The Umayyad dynasty fell, and after it several other Islamic states, and yet the dinar continues to be held and to circulate widely in Islamic regions in the original weight and size specifications of the bezant, and is used in dowries, gifts, and various religious and traditional customs to this day. Unlike the Romans and the Byzantines, Arab and Muslim civilizations' collapse was not linked to the collapse of their money as they maintained the integrity of their currencies for centuries. 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. Seventeen centuries of people the world over have used this coin for transactions, emphasizing the salability of gold across time.

The Renaissance

After the economic and military collapse of the Roman Empire, feudalism emerged as the prime mode of organizing society. The destruction of sound money was pivotal in turning the former citizens of the Roman Empire into serfs under the mercy of their local feudal lords. Gold was concentrated in the hands of the feudal lords, and the main forms of money available for the peasantry of Europe at the time were copper and bronze coins, whose supply was easy to inflate as industrial production of these metals continued to become easier with the advance of metallurgy, making them terrible stores of value, as well as silver coins that were usually debased, cheated, and nonstandardized across the continent, giving them poor salability across space and limiting the scope of trade across the continent.

Taxation and inflation had destroyed the wealth and savings of the people of Europe. New generations of Europeans came to the world with no accumulated wealth passed on from their elders, and the absence of a widely accepted sound monetary standard severely restricted the scope for trade, closing societies off from one another and enhancing parochialism as once-prosperous and civilized trading societies fell into the Dark Ages of serfdom, diseases, closed-mindedness, and religious persecution.

While it is widely recognized that the rise of the city-states dragged Europe out of the Dark Ages and into the Renaissance, the role of sound money in this rise is less recognized. It was in the city-states that humans could live with the freedom to work, produce, trade, and flourish, and that was to a large extent the result of these city-states adopting a sound monetary standard. It all began in Florence in 1252, when the city minted the florin, the first major European sound coinage since Julius Caesar's aureus. 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. Venice was the first to follow Florence's example with its minting of the ducat, of the same specifications as the florin, in 1270, and by the end of the fourteenth century 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 sound money that was highly salable across time and space, and divided into small coins, allowing for easy divisibility. With the economic liberation of the European peasantry came the political, scientific, intellectual, and cultural flourishing of the Italian city-states, which later spread across the European continent. Whether in Rome, Constantinople, Florence, or Venice, history shows that a sound monetary standard is a necessary prerequisite for human flourishing, without which society stands on the precipice of barbarism and destruction.

Although the period following the introduction of the florin witnessed an improvement in the soundness of money, with more and more Europeans able to adopt gold and silver for saving and trade, and the extent of markets expanding across Europe and the world, the situation was far from perfect. There were still many periods during which various sovereigns would debase their people's currency to finance war or lavish expenditure. Given that they were used physically, silver and gold complemented each other: gold's high stock-to-flow ratio meant it was ideal as a long-term store of value and a means of large payments, but 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. While this arrangement had benefits, it had one major drawback: the fluctuating rate of exchange between gold and silver created trade and calculation problems. Attempts to fix the price of the two

currencies relative to one another were continuously self-defeating, but gold's monetary edge was to win out.

As sovereigns set an exchange rate between the two commodities, they would change holders' incentives to hold or spend them. This inconvenient bimetallism continued for centuries across Europe and the world, but as with the move from salt, cattle, and seashells to metals, the inexorable advance of technology was to provide a solution to it.

Two particular technological advancements would move Europe and the world away from physical coins and in turn help bring about the demise of silver's monetary role: the telegraph, first deployed commercially in 1837, and the growing network of trains, allowing transportation across Europe. With these two innovations, it became increasingly feasible for banks to communicate with each other, sending payments efficiently across space when needed and debiting accounts instead of having to send physical payments. This led to the increased use of bills, checks, and paper receipts as monetary media instead of physical gold and silver coins.

More nations began to switch to a monetary standard of paper fully backed by, and instantly redeemable into, precious metals held in vaults. Some nations would choose gold, and others would choose silver, in a fateful decision that was to have enormous consequences. Britain was the first to adopt a modern gold standard in 1717, under the direction of physicist Isaac Newton, who was the warden of the Royal Mint, and the gold standard would play a great role in it advancing its trade across its empire worldwide. Britain would remain under a gold standard 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, and other European countries began to follow it. The end of the Napoleonic wars heralded the beginning of the golden age of Europe, as, one by one, the major European nations began adopting the gold standard. The more nations officially adopted the gold standard, the more marketable gold became and the larger the incentive became for other nations to join.

Further, instead of individuals having to carry gold and silver coins for large and small transactions, respectively, they could now store their wealth in gold in banks while using paper receipts, bills, and checks to make payments of any size. The holders of paper receipts could just use

them to make payment themselves; bills were discounted by banks and used for clearance and checks could be cashed from the banks that issued them. This solved the problem of gold's salability across scales, making gold the best monetary medium—for as long as the banks hoarding people's gold would not increase the supply of papers they issued as receipts.

With these media being backed by physical gold in the vaults and allowing payment in whichever quantity or size, there was no longer a real need for silver's role in small payments. The death knell for silver's monetary role was the end of the Franco-Prussian war, when Germany extracted an indemnity of £200 million in gold from France and used it to switch to a gold standard. With Germany now joining Britain, France, Holland, Switzerland, Belgium, and others on a gold standard, the monetary pendulum had swung decisively in favor of gold, leading to individuals and nations worldwide who used silver to witness a progressive loss of their purchasing power and a stronger incentive to shift to gold. India finally switched from silver to gold in 1898, while China and Hong Kong were the last economies in the world to abandon the silver standard in 1935.

For as long as gold and silver were used for payment directly, they both had a monetary role to play and their price relative to one another remained largely constant across time, at a ratio between 12 and 15 ounces of silver per ounce of gold, in the same range as their relative scarcity in the crust of the earth and the relative difficulty and cost of extracting them. But as paper and financial instruments backed by these metals became more and more popular, there was no more justification for silver's monetary role, and individuals and nations shifted to holding gold, leading to a significant collapse in the price of silver, from which it would not recover. The average ratio between the two over the twentieth century was 47:1, and in 2017, it stood at 75:1. While gold still has a monetary role to play, as evidenced by central banks' hoarding of it, silver has arguably lost its monetary role. (See Figure 3.[9])

The 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

[9] *Source*: Lawrence H. Officer and Samuel H. Williamson, "The Price of Gold, 1257–Present," *Measuring Worth* (2017). Available at http://www.measuringworth.com/gold/

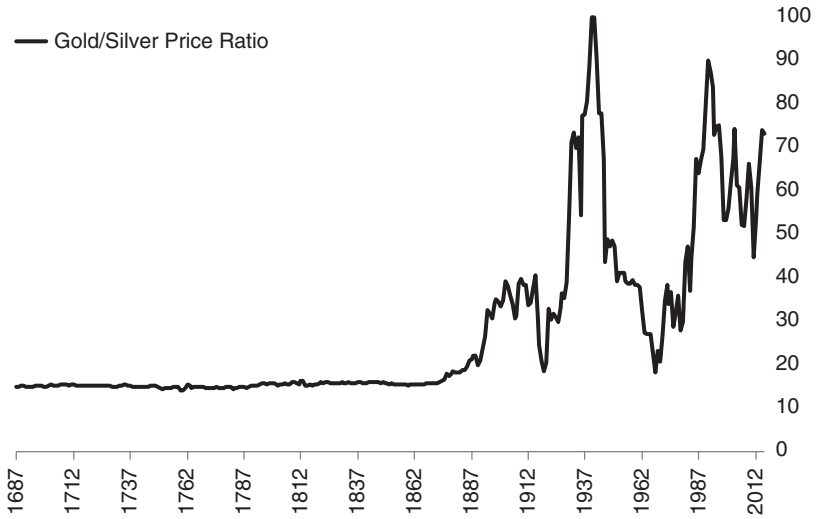

Figure 3 Price of gold in silver ounces, 1687–2017.

European countries, which led the British colonial government to increase taxes to finance its operation, leading to growing unrest and resentment of British colonialism. By the time India shifted the backing of its rupee to the gold-backed pound sterling in 1898, the silver backing its rupee had lost 56% of its value in the 27 years since the end of the Franco-Prussian War. For China, which stayed on the silver standard until 1935, its silver (in various names and forms) lost 78% of its value over the period. It is the author's opinion that the history of China and India, and their failure to catch up to the West during the twentieth century, is inextricably linked to this massive destruction of wealth and capital brought about by the demonetization of the monetary metal these countries utilized. The demonetization of silver in effect left the Chinese and Indians in a situation similar to west Africans holding aggri beads as Europeans arrived: domestic hard money was easy money for foreigners, and was being driven out by foreign hard money, which allowed foreigners to control and own increasing quantities of the capital and resources of China and India during the period. This is a historical lesson of immense significance, and should be kept in mind by anyone who thinks his refusal of Bitcoin means he doesn't have to

deal with it. History shows it is not possible to insulate yourself from the consequences of others holding money that is harder than yours.

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 hoarding the gold. Tragically, the only way gold was able to solve the problems of salability across scales, space, and time was by being centralized and thus falling prey to the major problem of sound money emphasized by the economists of the twentieth century: individual sovereignty over money and its resistance to government centralized control. We can thus understand why nineteenth-century sound money economists like Menger focused their understanding of money's soundness on its salability as a market good, whereas twentieth-century sound money economists, like Mises, Hayek, Rothbard, and Salerno, focused their analysis of money's soundness on its resistance to control by a sovereign. Because the Achilles heel of 20th century money was its centralization in the hands of the government, we will see later how the money invented in the twenty-first century, Bitcoin, was designed primarily to avoid centralized control.

La Belle Époque

The end of the Franco-Prussian War in 1871, and the consequent shift of all major European powers onto the same monetary standard, namely gold, led to a period of prosperity and flourishing that continues to appear more amazing with time and in retrospect. A case can be made for the nineteenth century—in particular, the second half of it—being the greatest period for human flourishing, innovation, and achievement that the world had ever witnessed, and the monetary role of gold was pivotal to it. With silver and other media of exchange increasingly demonetized, the majority of the planet used the same golden monetary standard, allowing the improvements in telecommunications and transportation to foster global capital accumulation and trade like never before.

Different currencies were simply different weights of physical gold, and the exchange rate between one nation's currency and the other

Table 1 Major European Economies' Periods Under the Gold Standard

Currency	Period Under Gold Standard	Years
French Franc	1814–1914	100 years
Dutch Guilder	1816–1914	98 years
Pound Sterling	1821–1914	93 years
Swiss Franc	1850–1936	86 years
Belgian Franc	1832–1914	82 years
Swedish Krona	1873–1931	58 years
German Mark	1875–1914	39 years
Italian Lira	1883–1914	31 years

was the simple conversion between different weight units, as straightforward as converting inches to centimeters. The British pound was defined as 7.3 grams of gold, while the French franc was 0.29 grams of gold and the Deutschmark 0.36 grams, meaning the exchange rate between them was necessarily fixed at 26.28 French francs and 24.02 Deutschmark per pound. In the same way metric and imperial units are just a way to measure the underlying length, national currencies were just a way to measure economic value as represented in the universal store of value, gold. Some countries' gold coins were fairly salable in other countries, as they were just gold. 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. People held as much money as they pleased and spent as much as they desired on local or foreign production, and the actual money supply was not even easily measurable.

The soundness of money was reflected in free trade across the world, but perhaps more importantly, was increasing savings rates across most advanced societies that were on the gold standard, allowing for capital accumulation to finance industrialization, urbanization, and the technological improvements that have shaped our modern life. (See Table 1.[10])

By 1900, around 50 nations were officially on the gold standard, including all industrialized nations, while the nations that were not on an official gold standard still had gold coins being used as the main medium

[10] *Source*: Lips, 2001.

of exchange. Some of the most important technological, medical, economic, and artistic human achievements were invented during the era of the gold standard, which partly explains why it was known as *la belle époque*, or the beautiful era, across Europe. Britain witnessed the peak years of Pax Britannica, where the British Empire expanded worldwide and was not engaged in large military conflicts. In 1899, when American writer Nellie Bly set out on her record-breaking journey around the world in 72 days, she carried British gold coins and Bank of England notes with her.[11] It was possible to circumnavigate the globe and use one form of money everywhere Nellie went.

In the United States this era was called the Gilded Age, where economic growth boomed after the restoration of the gold standard in 1879 in the wake of the American Civil War. It was only interrupted by one episode of monetary insanity, which was effectively the last dying pang of silver as money, discussed in Chapter 6, when the Treasury tried to remonetize silver by mandating it as money. This caused a large increase in the money supply and a bank run by those seeking to sell Treasury notes and silver to gold. The result was the recession of 1893, after which U.S. economic growth resumed.

With the majority of the world on one sound monetary unit, there was never a period that witnessed as much capital accumulation, global trade, restraint on government, and transformation of living standards worldwide. Not only were the economies of the west far freer back then, the societies themselves were far freer. Governments had very few bureaucracies focused on micromanaging the lives of citizens. As Mises described it:

> The gold standard was the world standard of the age of capitalism, increasing welfare, liberty, and democracy, both political and economic. In the eyes of the free traders its main eminence was precisely the fact that it was an international standard as required by international trade and the transactions of the international money and capital markets. It was the medium of exchange by means of which Western industrialism and Western capital had borne Western civilization to the remotest parts of the earth's surface, everywhere destroying the fetters of old-aged prejudices and superstitions, sowing

[11] Nellie Bly, *Around the World in Seventy-Two Days* (New York: Pictorial Weeklies, 1890).

> 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.
>
> It is easy to understand why people viewed the gold standard as the symbol of this greatest and most beneficial of all historical changes.[12]

This world came crashing down in the catastrophic year 1914, which was 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 with unsound government money. Only Switzerland and Sweden, who remained neutral during World War I, were to remain on a gold standard into the 1930s. The era of government-controlled money was to commence globally after that, with unmitigated disastrous consequences.

While the gold standard of the nineteenth century was arguably the closest thing that the world had ever seen to an ideal sound money, it nonetheless had its flaws. First, governments and banks were always creating media of exchange beyond the quantity of gold in their reserves. Second, many countries used not just gold in their reserves, but also currencies of other countries. Britain, as the global superpower at that time, had benefited from having its money used as a reserve currency all around the world, resulting in its reserves of gold being a tiny fraction of its outstanding money supply. With growing international trade relying on settlement of large quantities of money across the world, the Bank of England's banknotes became, in the minds of many at the time, "as good as gold." While gold was very hard money, the instruments used for settlements of payments between central banks, although nominally redeemable in gold, ended up in practice being easier to produce than gold.

These two flaws meant that the gold standard was always vulnerable to a run on gold in any country where circumstances might lead a large enough percentage of the population to demand redemption of their paper money in gold. The fatal flaw of the gold standard at the heart of these two problems was that settlement in physical gold is

[12]Ludwig von Mises, *Human Action* (pp. 472–473).

cumbersome, expensive, and insecure, which meant it had to rely on centralizing physical gold reserves in a few locations—banks and central banks—leaving them vulnerable to being taken over by governments. As the number of payments and settlements conducted in physical gold became an infinitely smaller fraction of all payments, the banks and central banks holding the gold could create money unbacked by physical gold and use it for settlement. The network of settlement became valuable enough that its owners' credit was effectively monetized. As the ability to run a bank started to imply money creation, governments naturally gravitated to taking over the banking sector through central banking. The temptation was always too strong, and the virtually infinite financial wealth this secured could not only silence dissent, but also finance 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. This might have been feasible when the population was highly educated and knowledgeable about the dangers of unsound money, but with every passing generation displaying the intellectual complacence that tends to accompany wealth,[13] the siren song of con artists and court-jester economists would prove increasingly irresistible for more of the population, leaving only a minority of knowledgeable economists and historians fighting an uphill battle to convince people that wealth can't be generated by tampering with the money supply, that allowing a sovereign the control of the money can only lead to them increasing their control of everyone's life, and that civilized human living itself rests on the integrity of money providing a solid foundation for trade and capital accumulation.

Gold being centralized made it vulnerable to having its monetary role usurped by its enemies, and gold simply had too many enemies, as Mises himself well understood:

> The nationalists are fighting the gold standard because they want to sever their countries from the world market and to establish national autarky as far as possible. Interventionist governments and pressure groups are fighting the gold standard because they consider it the

[13] See John Glubb, *The Fate of Empires and Search for Survival*.

> most serious obstacle to their endeavours to manipulate prices and wage rates. But the most fanatical attacks against gold are made by those intent upon credit expansion. With them credit expansion is the panacea for all economic ills.[14]
>
> The gold standard removes the determination of cash-induced changes in purchasing power from the political arena. Its general acceptance requires the acknowledgement of the truth that one cannot make all people richer by printing money. The abhorrence of the gold standard is inspired by the superstition that omnipotent governments can create wealth out of little scraps of paper [. . .] The governments were eager to destroy it, because they were committed to the fallacies that credit expansion is an appropriate means of lowering the rate of interest and of "improving" the balance of trade [. . .] People fight the gold standard because they want to substitute national autarky for free trade, war for peace, totalitarian government omnipotence for liberty.[15]

The twentieth century began with governments bringing their citizens' gold under their control through the invention of the modern central bank on the gold standard. As World War I started, the centralization of these reserves allowed these governments to expand the money supply beyond their gold reserves, reducing the value of their currency. Yet central banks continued to confiscate and accumulate more gold until the 1960s, where the move toward a U.S. dollar global standard began to shape up. Although gold was supposedly demonetized fully in 1971, central banks continued to hold significant gold reserves, and only disposed of them slowly, before returning to buying gold in the last decade. Even as central banks repeatedly declared the end of gold's monetary role, their actions in maintaining their gold reserves ring truer. From a monetary competition perspective, keeping gold reserves is a perfectly rational decision. Keeping reserves in foreign governments' easy money only will cause the value of the country's currency to devalue along with the reserve currencies, while the seniorage accrues to the issuer of the reserve currency, not the nation's central bank. Further, should central banks sell all their gold holdings (estimated at around 20% of global gold stockpiles), the most likely impact is that

[14]Ludwig von Mises, *Human Action* (p. 473).
[15]Ludwig von Mises, *Human Action* (p. 474).

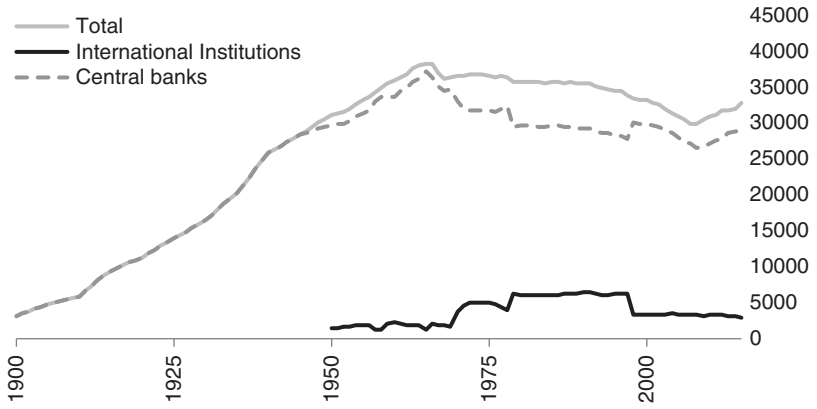

Figure 4 Central bank official gold reserves, tons.

gold, being highly prized for its industrial and aesthetic uses, would be bought up very quickly with little depreciation of its price and the central banks would be left without any gold reserves. The monetary competition between easy government money and hard gold will likely result in one winner in the long-run. Even in a world of government money, governments have not been able to decree gold's monetary role away, as their actions speak louder than their words. (See Figure 4.[16])

[16] *Source*: World Gold Council, Reserve Statistics. Available at https://www.gold.org/data/gold-reserves

Chapter 4

Government Money

World War I saw the end of the era of monetary media being the choice decided by the free market, and the beginning of the era of government money. While gold continues to underpin the global monetary system to this day, government edicts, decisions, and monetary policy shape the monetary reality of the world more than any aspect of individual choice.

The common name for government money is *fiat money*, from the Latin word for decree, order, or authorization. Two important facts must be understood about government money from the outset. First, there is a very large difference between government money redeemable in gold, and irredeemable government money, even if both are run by the government. Under a gold standard, money is gold, and government just assumes a responsibility of minting standard units of the metal or printing paper backed by the gold. The government has no control over the supply of gold in the economy, and people are able to redeem their paper in physical gold at any time, and use other shapes and forms of gold, such as bullion bars and foreign coins, in their dealings with one

another. With irredeemable government money, on the other hand, the government's debt and/or paper is used as money, and the government is able to increase its supply as it sees fit. Should anybody use other forms of money for exchange, or should they attempt to create more of the government's money, they run the risk of punishment.

The second and often overlooked fact, is that, contrary to what the name might imply, no 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. Only through redeemability into salable forms of money did government paper money gain its salability. Government may issue decrees mandating people use their paper for payments, but no government has imposed this salability on papers without these papers having first been redeemable in gold and silver. Until this day, all government central banks maintain reserves to back up the value of their national currency. The 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. No pure fiat currency exists in circulation without any form of backing. Contrary to the most egregiously erroneous and central tenet of the state theory of money, 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.

The oldest recorded example of fiat money was *jiaozi*, a paper currency issued by the Song dynasty in China in the tenth century. Initially, *jiaozi* was a receipt for gold or silver, but then government controlled its issuance and suspended redeemability, increasing the amount of currency printed until it collapsed. The Yuan dynasty also issued fiat currency in 1260, named *chao*, and exceeded the supply far beyond the metal backing, with predictably disastrous consequences. As the value of the money collapsed, the people fell into abject poverty, with many peasants resorting to selling their children into debt slavery.

Government money, then, is similar to primitive forms of money discussed in Chapter 2, and commodities other than gold, in that it is liable to having its supply increased quickly compared to its stock, leading to a quick loss of salability, destruction of purchasing power, and impoverishment of its holders. In this respect it differs from gold, whose

supply cannot be increased due to the fundamental chemical properties of the metal discussed above. That the government demands payment in its money for its taxes may guarantee a longer life for that money, but only if the government is able to prevent the quick expansion of the supply can it protect its value from depreciating quickly. When comparing different national currencies, we find that the major and most widely used national currencies have a lower annual increase in their supply than the less salable minor currencies.

Monetary Nationalism and the End of the Free World

The many enemies of sound money whom Mises named in the quote referenced at the end of the last chapter were to have their victory over the gold standard with the beginning of a small war in Central Europe in 1914, which snowballed into the first global war in human history. Certainly, when the war started nobody had envisioned it lasting as long, and producing as many casualties, as it did. British newspapers, for example, heralded it as the August Bank Holiday War, expecting it to be a simple triumphant summer excursion for their troops. There was a sense that this would be a limited conflict. And, after decades of relative peace across Europe, a new generation of Europeans had not grown to appreciate the likely consequences of launching war. Today, historians still fail to offer a convincing strategic or geopolitical explanation for why a conflict between the Austro-Hungarian Empire and Serbian separatists was to trigger a global war that claimed the lives of millions and drastically reshaped most of the world's borders.

In retrospect, the major difference between World War I and the previous limited wars was neither geopolitical nor strategic, but rather, it was monetary. When governments were on a gold standard, they had direct control of large vaults of gold while their people were dealing with paper receipts of this gold. The 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. Within a few weeks of the war starting, all major belligerents had suspended gold convertibility, effectively going off the gold standard and putting

their population on a fiat standard, wherein the money they used was government-issued paper that was not redeemable for gold.

With the simple suspension of gold redeemability, governments' war efforts were no longer limited to the money that they had in their own treasuries, but extended virtually to the entire wealth of the population. For as long as the government could print more money and have that money accepted by its citizens and foreigners, it could keep financing the war. Previously, under a monetary system where gold as money was in the hands of the people, government only had its own treasuries to sustain its war effort, along with any taxation or bond issues to finance the war. This made conflict limited, and lay at the heart of the relatively long periods of peace experienced around the world before the twentieth century.

Had European nations remained on the gold standard, or had the people of Europe held their own gold in their own hands, forcing government to resort to taxation instead of inflation, history might have been different. It is likely that World War I would have been settled militarily within a few months of conflict, as one of the allied factions started running out of financing and faced difficulties in extracting wealth from a population that was not willing to part with its wealth to defend their regime's survival. But with the suspension of the gold standard, running out of financing was not enough to end the war; a sovereign had to run out of its people's accumulated wealth expropriated through inflation.

European countries devaluing their currency allowed the bloody stalemate to continue for four years, with no resolution or advancement. The senselessness of it all was not lost on the populations of these countries, and the soldiers on the front line risking their lives for no apparent reason but the unbounded vanity and ambition of monarchs who were usually related and intermarried. In the most vivid personification of the absolute senselessness of this war, on Christmas Eve 1914, French, English, and German soldiers stopped following orders to fight, laid down their arms, and crossed the battle lines to mingle and socialize with one another. Many of the German soldiers had worked in England and could speak English, and most soldiers had a fondness for football, and so many impromptu games were organized between the teams.[1]

[1] Malcolm Brown and Shirley Seaton, *Christmas Truce: The Western Front December 1914* (London: Pan Macmillan, 2014).

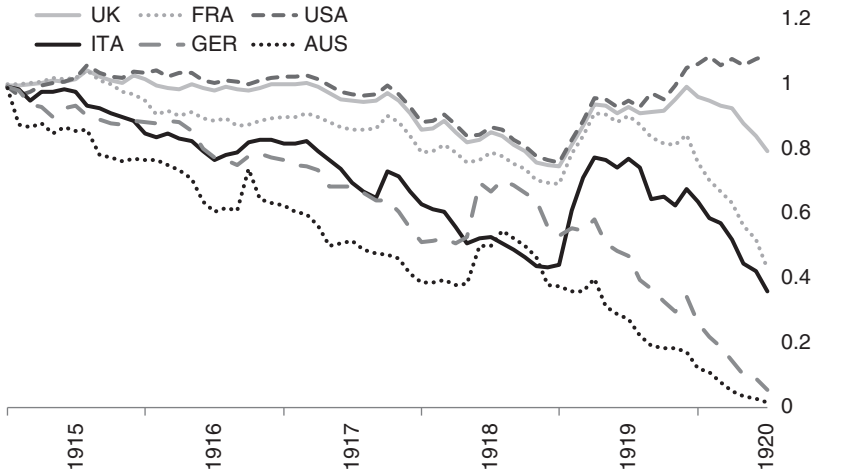

Figure 5 Major national exchange rates vs. Swiss Franc during WWI. Exchange rate in June 1914 = 1.

The astounding fact exposed by this truce is that these soldiers had nothing against each other, had nothing to gain from fighting this war, and could see no reason to continue it. A far better outlet for their nations' rivalry would be in football, a universally popular game where tribal and national affiliations can be played out peacefully.

The war was to continue for four more years with barely any progress, 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 a large amount of resources with which their enemies could no longer keep up. While all governments were funding their war machines with inflation, Germany and the Austro-Hungarian Empire began to witness serious decline in the value of their currency in 1918, making their defeat inevitable. Comparing the belligerents' currencies' exchange rates to the Swiss Franc, which was still on the gold standard at the time, provides a useful measure of the devaluation each currency experienced, as is shown in Figure 5.[2]

After the dust settled, the currencies of all major European powers had declined in real value. The losing powers, Germany and Austria, had

[2] *Source*: George Hall, "Exchange Rates and Casualties During the First World War," *Journal of Monetary Economics*.

Table 2 Depreciation of National Currency Against the Swiss Franc During World War I

Nation	WWI Currency Depreciation
USA	3.44%
UK	6.63%
FRA	9.04%
ITA	22.3%
GER	48.9%
AUS	68.9%

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 U.K.'s to 93%, and the U.S. currency only to 96% of its original value.[3] (See Table 2.[4])

The geographic changes brought about by the war were hardly worth the carnage, as most nations gained or lost marginal lands and no victor could claim to have captured large territories worth the sacrifice. The Austro-Hungarian Empire was broken up into smaller nations, but these remained ruled by their own people, and not the winners of the war. The major adjustment of the war was the removal of many European monarchies and their replacement with republican regimes. Whether such a transition was for the better pales in comparison to the destruction and devastation that the war had inflicted on the citizens of these countries.

With redemption of gold from central banks, and movement of gold internationally suspended or severely restricted in the major economies, governments could maintain the façade of the currency's value remaining at its prewar peg to gold, even as prices were rising. As the war ended, the international monetary system revolving around the gold standard was no longer functional. All countries had gone off gold and had to face the

[3]I have wondered if the proximity of Germany and Austria to Switzerland, and the close relations between these populations, may have led to more Germans and Austrians exchanging their currencies for the Swiss Franc, which hastened the fall of these currencies, stretching the economic resources of the governments, and playing a decisive role in the outcome of World War I. I have never come across any research on this question, but if you do, dear reader, please do get in touch.

[4]From July 1914 to November 1918. *Source*: George Hall, "Exchange Rates and Casualties During the First World War," *Journal of Monetary Economics*.

major dilemma of whether they should get back onto a gold standard, and if so, how to revalue their currencies compared to gold. A fair market valuation of their existing stock of currency to their stock of gold would be a hugely unpopular admission of the depreciation that the currency underwent. A return to the old rates of exchange would cause citizens to demand holding gold rather than the ubiquitous paper receipts, and lead to the flight of gold outside the country to where it was fairly valued.

This dilemma took money away from the market and turned it into a politically controlled economic decision. Instead of market participants freely choosing the most salable good as a medium of exchange, the value, supply, and interest rate for money now became centrally planned by national governments, a monetary system which Hayek named Monetary Nationalism, in a brilliant short book of the same name:

> By Monetary Nationalism I mean the doctrine that a country's share in the world's supply of money should not be left to be determined by the same principles and the same mechanism as those which determine the relative amounts of money in its different regions or localities. A truly 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 by the results of the action of all individuals.[5]

Never again would gold return to being the world's homogeneous currency, with central banks' monopoly position and restrictions on gold ownership forcing people to use national government moneys. The 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 be analyzed in Chapter 9.

The Interwar Era

Whereas under the international gold standard money flowed freely between nations in return for goods, and the exchange rate between

[5]Friedrich Hayek, *Monetary Nationalism and International Stability* (Fairfield, NJ: Augustus Kelley, 1989 [1937]).

different currencies was merely the conversion between different weights of gold, under monetary nationalism the money supply of each country, and the exchange rate between them, was to be determined in international agreements and meetings. Germany suffered from hyperinflation after the Treaty of Versailles had imposed large reparations on it and it sought to repay them using inflation. Britain had major problems with the flow of gold from its shores to France and the United States as it attempted to maintain a gold standard but with a rate that overvalued the British pound and undervalued gold.

The first major treaty of the century of monetary nationalism was the 1922 Treaty of Genoa. Under the terms of this treaty, the U.S. dollar and the British pound were to be considered reserve currencies similar to gold in their position in other countries' reserves. With this move, the U.K. had hoped to alleviate its problems with the overvalued sterling by having other countries purchase large quantities of it to place in their reserves. The world's major powers signaled their departure from the solidity of the gold standard 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 of their currency stable in terms of gold at prewar levels. Safety was sought in numbers: if everyone devalued their currencies, there would be nowhere for capital to hide. But this 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 episode, and does a good job of discussing the individuals involved and the drama taking place, but adopts the reigning Keynesian understanding of the issue, putting the blame for the entire episode on the gold standard. In spite of his extensive research, Ahamed fails to comprehend that the problem was not the gold standard, but that post-World War I governments had wanted to return to the gold standard at the pre-World War I rates. Had they admitted to their people the magnitude of the devaluation that took place to fight the war, and re-pegged their currencies to gold at new rates, there would have probably been a recessionary crash, after which the economy would have recovered on a sound monetary basis.

A better treatment of this episode, and its horrific aftermath, can be found in Murray Rothbard's *America's Great Depression*. As Britain's gold reserves were leaving its shores to places where they were better valued, the chief of the Bank of England, Sir Montagu Norman, leaned heavily on his French, German, and American counterparts to increase the money supply in their countries, devaluing their paper currencies in the hope that it would stem the flow of gold away from England. While the French and German bankers were not cooperative, 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 the most important implication of it was that it created a larger bubble in the housing and stock markets in the United States. The U.S. Fed's inflationary policy ended by the end of 1928, at which point the U.S. economy was ripe for the inevitable collapse that follows from the suspension of inflationism. What followed was the 1929 stock market crash, and the reaction of the U.S. government turned that into the longest depression in modern recorded history.

The common story about the Great Depression posits that President Hoover chose to remain inactive in the face of the downturn, due to a misplaced faith in the ability of free markets to bring about recovery, and adherence to the gold standard. Only when he was replaced by Franklin Delano Roosevelt, who moved to an activist governmental role and suspended the gold standard, did the U.S. recovery ensue. This, to put it mildly, is nonsense. Hoover not only increased government spending on public work projects to fight the Depression, but he also leaned on the Federal Reserve to expand credit, and made the focus of his policy the insane quest to keep wages high in the face of declining wage rates. Further, price controls were instituted to keep prices of products, particularly agricultural, at high levels, similar to what was viewed as the fair and correct state that preceded the depression. The United States and all major global economies began to implement protective trade policies that made matters far worse across the world economy.[6]

[6]A thorough accounting of Hoover's interventionist policies can be found in Murray Rothbard's *America's Great Depression*.

It is a little-known fact, carefully airbrushed from the history books, that in the 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. It's important to realize there was nothing unique or new about the New Deal. It was a magnification of the heavily interventionist policies which Hoover had instituted.

A precursory understanding of economics will make it clear that price controls are always counterproductive, resulting in surpluses and shortages. The problems faced by the American economy in the 1930s were inextricably linked to the fixing of wages and prices. Wages were set too high, resulting in a very high unemployment rate, reaching 25% at certain points, while price controls had created shortages and surpluses of various goods. Some agricultural products were even burned in order to maintain their high prices, leading to the insane situation where people were going hungry, desperate for work, while producers couldn't hire them as they couldn't afford their wages, and the producers who could produce some crops had to burn some of them to keep the price high. All of this was done to maintain prices at the pre-1929 boom levels while holding onto the delusion that the dollar had still maintained its value compared to gold. The inflation of the 1920s had caused large asset bubbles to form in the housing and stock markets, causing an artificial rise in wages and prices. After the bubble burst, market prices sought readjustment via a drop in the value of the dollar compared to gold, and a drop in real wages and prices. The pigheadedness of deluded central planners who wanted to prevent all three from taking place paralyzed the economy: the dollar, wages, and prices were overvalued, leading to people seeking to drop their dollars for gold, as well as massive unemployment and failure of production.

None of this, of course, would be possible with sound money, and only through inflating the money supply did these problems occur. And even after the inflation, the effects would have been far less disastrous had they revalued the dollar to gold at a market-determined price and let wages and prices adjust freely. Instead of learning that lesson, the

government economists of the era decided that the fault was not in inflationism, but rather, in the gold standard which restricted government's inflationism. In order to remove the golden fetters to inflationism, President Roosevelt issued an executive order banning the private ownership of gold, forcing Americans to sell their gold to the U.S. Treasury at a rate of $20.67 per ounce. With the population deprived of sound money, and forced to deal with dollars, Roosevelt then revalued the dollar on the international market from $20.67 per ounce to $35 per ounce, a 41% devaluation of the dollar in real terms (gold). This was the inevitable reality of years of inflationism which started in 1914 with the creation of the Federal Reserve and the financing of America's entry into World War II.

It was the abandonment of sound money and its replacement with government-issued fiat which turned the world's leading economies into centrally planned and government-directed failures. As governments controlled money, they controlled most economic, political, cultural, and educational activity. Having never studied economics or researched it professionally, Keynes captured the zeitgeist of omnipotent government to come up with the definitive track that gave governments what they wanted to hear. Gone were all the foundations of economic knowledge acquired over centuries of scholarship around the world, to be replaced with the new faith with the ever-so-convenient conclusions that suited high time-preference politicians and totalitarian governments: the state of the economy is determined by the lever of aggregate spending, and any rise in unemployment or slowdown in production had no underlying causes in the structure of production or in the distortion of markets by central planners; rather it was all a shortage of spending, and the remedy is the debauching of the currency and the increase of government spending. Saving reduces spending and because spending is all that matters, government must do all it can to deter its citizens from saving. Imports drive workers out of work, so spending increases must go on domestic goods. Governments loved this message, and Keynes himself knew that. His book was translated into German in 1937, at the height of the Nazi era, and in the introduction to the German edition Keynes wrote:

> The theory of aggregate production, which is the point of the following book, nevertheless can be much easier adapted to the conditions

> of a totalitarian state than the theory of production and distribution of a given production put forth under conditions of free competition and a large degree of laissez-faire.[7]

The Keynesian deluge, from which the world is yet to recover, had begun. Universities lost their independence and became part and parcel of the government's ruling apparatus. Academic 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 for managing economic activities. The notion that government management of the economy is necessary became the unquestioned starting point of all modern economic education, as can be gleaned from looking at any modern economics textbook, where government plays the same role that God plays in religious scriptures: an omnipresent, omniscient, omnipotent force that merely needs to identify problems to satisfactorily address them. Government is immune to the concept of opportunity costs, and rarely are the negative results of government intervention in economic activity even considered, and if they are, it is only to justify even more government intervention. The classical liberal tradition that viewed economic freedom as the foundation of economic prosperity was quietly brushed aside as government propagandists masquerading as economists presented the Great Depression, caused and exacerbated by government controls, as the refutation of free markets. Classical liberals 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 the U.K., where these giants 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. The same gold standard which produced more than four decades of virtually uninterrupted global growth and prosperity between 1870 and 1914 suddenly stopped working in the 1930s because it wouldn't allow governments to

[7] Quoted in Henry Hazlitt, *The Failure of the New Economics*. p. 277.

expand their money supply to fight the depression, whose causes these economists cannot explain beyond meaningless Keynesian allusions to animal spirits. And none of these economists seem to notice that if the problem was indeed the gold standard, then its suspension should have caused the beginning of recovery. Instead, it took more than a decade after its suspension for growth to resume. The conclusion obvious to anyone with a basic understanding of money and economics is that the cause of the Great Crash of 1929 was the diversion away from the gold standard in the post-WWI years, and that the deepening of the Depression was caused by government control and socialization 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.

As the major economies of the world went off the gold standard, global trade was soon to be shipwrecked on the shores of oscillating fiat money. With no standard of value to allow an international price mechanism to exist, and with governments increasingly captured by statist and isolationist impulses, currency manipulation emerged as a tool of trade policy, with countries seeking to devalue their currencies in order to give their exporters an advantage. More trade barriers were erected, and economic nationalism became the ethos of that era, with predictably disastrous consequences. The nations that had prospered together 40 years earlier, trading under one universal gold standard, now had large monetary and trade barriers between them, loud populist leaders who blamed all their failures on other nations, and a rising tide of hateful nationalism that was soon to fulfill 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."[8]

World War II and Bretton Woods

From the sky the bombs did drop, along with countless heretofore unimaginable forms of murder and horror. The war machines that

[8]Otto Mallery, *Economic Union and Durable Peace* (Harper and Brothers, 1943), p. 10.

the government-directed economies built were far more advanced than any the world had ever seen, thanks to the popularity of the most dangerous and absurd of all Keynesian fallacies, the notion that 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 families or governments murdering foreigners: it all counts in aggregate demand and it all reduces unemployment! As an increasing number of people went hungry during the depression, all major governments spent generously on arming themselves, and the result was a return to the senseless destruction of three decades earlier.

For Keynesian economists, the war was what caused economic recovery, and if one looked at life merely through the lens of statistical aggregates collected by government bureaucrats, such a ridiculous notion is tenable. With government war expenditure and conscription on the rise, aggregate expenditure soared while unemployment plummeted, so all countries involved in World War II had recovered because of their participation in the war. Anybody not afflicted with Keynesian economics, however, can realize that life during World War II, even in countries that did not witness war on their soil, like the United States, cannot by any stretch of the imagination be characterized as "economic recovery." On top of the death and destruction, the dedication of so much of the capital and labor resources of the belligerent countries to the war effort meant severe shortages of output at home, resulting in rationing and price controls. In the United States, construction of new housing and repair of existing housing were banned.[9] More obviously, one cannot possibly argue that soldiers fighting and dying at warfronts, who constituted a large percentage of the populations of belligerent nations, enjoyed any form of economic recovery, no matter how much aggregate expenditure went into making the weapons they were carrying.

But one of the most devastating blows to Keynesian theories of the aggregate demand as the determinant of the state of the economy came in the aftermath of World War II, particularly in the United States.

[9]Robert Higgs, "World War II and the Triumph of Keynesianism" (2001), Independent Institute research article. Available at http://www.independent.org/publications/article.asp?id=317

A confluence of factors had conspired to reduce government spending drastically, leading to Keynesian economists of the era predicting doom and gloom to follow the war: the end of military hostilities reduced government military spending dramatically. The death of the populist and powerful FDR and his replacement by the meeker and less iconic Truman, coming up against a Congress controlled by Republicans, created political deadlock that prevented the renewal of the statutes of the New Deal. All of these factors together, when analyzed by Keynesian economists, would point to impending disaster, as Paul Samuelson, the man who literally wrote the textbooks for economic education in the postwar era, wrote in 1943:

> The final conclusion to be drawn from our experience at the end of the last war is inescapable—were the war to end suddenly within the next 6 months, were we again planlessly to wind up our war effort in the greatest haste, to demobilize our armed forces, to liquidate price controls, 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 faced.[10]

The end of World War II and the dismantling of the New Deal meant the U.S. government cut its spending by an astonishing 75% between 1944 and 1948, and it also removed most price controls for good measure. And yet, the U.S. economy witnessed an extraordinary boom during these years. The 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 that the level of spending is what determines output in the economy. As soon as governmental central planning had abated for the first time since the 1929 crash, and as soon as prices were allowed to adjust freely, they served their role as the coordinating mechanism for economic activity, matching sellers and buyers, incentivizing the production of goods demanded by consumers and compensating workers for their effort. The

[10]Paul Samuelson, "Full Employment after the War," in Seymour Harris, *Postwar Economic Problems* (New York: McGraw-Hill, 1943).

situation was far from perfect, though, as the world remained off the gold standard, leading to ever-present distortions of the money supply which would continue to dog the world economy with crisis after crisis.

It is well-known that history is written by the victors, but in the era of government money, victors get to decide on the monetary systems, too. The United States summoned representatives of its allies to Bretton Woods in New Hampshire to discuss formulating a new global trading system. History has not been very kind to the architects of this system. Britain's representative was none other than John Maynard Keynes, whose economic teachings were to be wrecked on the shores of reality in the decades following the war, while America's representative, Harry Dexter White, would later be uncovered as a Communist who was in contact with the Soviet regime for many years.[11] In the battle for centrally planned global monetary orders, White was to emerge victorious with a plan that even made Keynes's look not entirely unhinged. The United States was to be the center of the global monetary system, with its dollars being used as a global reserve currency by other central banks, whose currencies would be convertible to dollars at fixed exchange rates, while the dollar itself would be convertible to gold at a fixed exchange rate. To facilitate this system, the United States would take gold from other countries' central banks.

[11] After being investigated and testifying in front of Congress, White suffered two heart attacks and died from an overdose of medication, which may have been suicide. A good treatment of this episode can be found in Benn Steil's *The Battle of Bretton Woods*, which pushes the view that White was a Soviet spy. An alternative reading of the situation can produce a more nuanced perspective, though hardly more flattering. The links between American progressives and Russian Communists precede the 1917 Russian putsch, and included significant U.S. funding to the Bolsheviks to depose the Russian 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 of this goal, and to depose reactionary monarchies that would not cooperate with this world order. Hence, American interests played a leading role in promoting the Bolsheviks and helping them take power, particularly through Leon Trotsky, who was in New York during the revolution, channeling funding and arms to his comrades in Russia. Whereas Trotsky was an internationalist socialist who would have cooperated with American interests, he was not to gain power in Russia, and instead Stalin was to succeed Lenin, and head in a more parochial direction, prioritizing socialism at home over global cooperation. From then on, American progressives maintained contact with Russian interests, attempting to sway Russia back into cooperation with American progressive interests, but to no avail. We can thus better understand White not as a Communist spy, but as an American progressive who sought cooperation with Russian Bolsheviks for the grand project of the postwar economic order the American progressives sought.

Whereas the American people were still prohibited from owning gold, the U.S. government promised to redeem dollars in gold to other countries' central banks at a fixed rate, opening what was known as the gold exchange window. In theory, the global monetary system was still based on gold, and if the U.S. government had maintained convertibility to gold by not inflating the dollar supply beyond their gold reserves while other countries had not inflated their money supply beyond their dollar reserves, the monetary system would have effectively been close to the gold standard of the pre-World War I era. They did not, of course, and in practice, the exchange rates were anything but fixed and provisions were made for allowing governments to alter these rates to address a "fundamental disequilibrium."[12]

In order to manage this global system of hopefully fixed exchange rates, and address any potential fundamental disequilibrium, the Bretton Woods conference established the International Monetary Fund, which acted as a global coordination body between central banks with the express aim of achieving stability of exchange rates and financial flows. In essence, Bretton Woods attempted to achieve through central planning what the international gold standard of the nineteenth century had achieved spontaneously. Under the classical gold standard the monetary unit was gold while capital and goods flowed freely between countries, spontaneously adjusting flows without any need for central control or direction, and never resulting in balance of payment crises: whatever amount of money or goods moved across borders did so at the discretion of its owners and no macroeconomic problems could emerge.

In the Bretton Woods system, however, governments were dominated by Keynesian economists who viewed activist fiscal and monetary policy as a natural and important part of government policy. The constant monetary and fiscal management would naturally lead to the fluctuation of the value of national currencies, resulting in imbalances in trade and capital flows. When a country's currency is devalued, its products become cheaper to foreigners, leading to more goods leaving the country, while holders of the currency seek to purchase foreign currencies to

[12]U.S. Department of State, "Volume I" in *Proceedings and Documents of the United Nations Monetary and Financial Conference*, Bretton Woods, New Hampshire, July 1–22, 1944.

protect themselves from devaluation. As devaluation is usually accompanied by artificially low interest rates, capital seeks exit from the country to go where it can be better rewarded, exacerbating the devaluation of the currency. On the other hand, countries which maintained their currency better than others would thus witness an influx of capital whenever their neighbors devalued, leading to their currency appreciating further. Devaluation would sow the seeds of more devaluation, whereas currency appreciation would lead to more appreciation, creating a problematic dynamic for the two governments. No such problems could exist with the gold standard, where the value of the currency in both countries was constant, because it was gold, and movements of goods and capital would not affect the value of the currency.

The automatic adjustment mechanisms of the gold standard had always provided a constant measuring rod against which all economic activity was measured, but the floating currencies gave the world economy imbalances. The International Monetary Fund's role was to perform an impossible balancing act between all the world's governments to attempt to find some form of stability or "equilibrium" in this mess, keeping exchange rates within some arbitrary range of predetermined values while trade and capital flows were moving and altering them. But without a stable unit of account for the global economy, this was a task as hopeless as attempting to build a house with an elastic measuring tape whose own length varied every time it was used.

Along with the establishment of the World Bank and IMF in Bretton Woods, the United States and its allies wanted to establish another international financial institution to specialize in arranging trade policy. The 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, commencing in 1948. GATT was meant to help the IMF in the impossible task of balancing budgets and trade to ensure financial stability—in other words, centrally planning global trade and fiscal and monetary policy to remain in balance, as if such a thing were possible.

An important, but often overlooked, aspect of the Bretton Woods system was that most of the member countries had moved large amounts of their gold reserves to the United States and received dollars in exchange, at a rate of $35 per ounce. The rationale was that the U.S.

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 the physical movement of gold. In essence, this system was akin to the entire world economy being run as one country on a gold standard, with the U.S. Federal Reserve acting as the world's central bank and all the world's central banks as regional banks, the main difference being that the monetary discipline of the gold standard was almost entirely lost in this world where there were no effective controls on all central banks in expanding the money supply, because no citizens could redeem their government money for gold. Only governments could redeem their dollars in gold from the United States, but that was to prove far more 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, and the tenuous link that the system had to gold proved powerless to stop the debauching of global currencies and the constant balance of payment crises affecting most countries. The United States, however, was put in a remarkable position, similar to, though massively exceeding in scope, the Roman Empire's pillaging and inflating the money supply used by most of the Old World. With its currency distributed all over the world, and central banks having to hold it as a reserve to trade with one another, the U.S. government could accrue significant seniorage from expanding the supply of dollars, and also had no reason to worry about running a balance of payment deficit. French economist Jacques Reuff coined the phrase "deficit without tears" to describe the new economic reality that the United States inhabited, where it could purchase whatever it wanted from the world and finance it through debt monetized by inflating the currency that the entire world used.

The relative fiscal restraint of the first few years after World War II soon gave way to the politically irresistible temptation of buying free lunches through inflation, particularly to the warfare and welfare states. The military industry that prospered during World War II grew into what President Eisenhower called the Military–Industrial Complex—an enormous conglomerate of industries that was powerful enough to demand ever more funding from the government, and drive U.S. foreign policy toward an endless series of expensive conflicts with no rational end goal or clear objective. The doctrine of violent militant

Keynesianism claimed this spending would be good for the economy, which made the millions of lives it destroyed easier to stomach for the American electorate.

This war machine was also made more palatable for the American people because it came from the same politicians who intensified government welfare in various shapes and forms. From The Great Society to affordable housing, education, and healthcare, fiat money allowed the American electorate to ignore the laws of economics and believe that a free lunch, or at least a perpetually discounted one, was somehow possible. In the absence of gold convertibility and with the ability to disperse the costs of inflation on the rest of the world, the only winning political formula consisted of increasing government spending financed by inflation, and every single presidential term in the postwar era witnessed a growth in government expenditure and the national debt and a loss of the purchasing power of the dollar. In the presence of fiat money to finance government, political differences between parties disappear as politics no longer contains trade-offs and every candidate can champion every cause.

Government Money's Track Record

The tenuous link of gold exchangeability was an annoying detail for the U.S. government's inflationism, and it manifested in two symptoms: first, the global gold market was always seeking to reflect the reality of inflationism through a higher gold price. This was addressed through the establishment of the London Gold Pool, which sought to drop the price of gold by offloading some of the gold reserves that governments held onto the market. This worked only temporarily, but in 1968, the U.S. dollar had to start getting revalued compared to gold to acknowledge the years of inflation it had suffered. The second problem was that some countries started trying to repatriate their gold reserves from the United States as they started to recognize the diminishing purchasing power of their paper money. French president Charles de Gaulle even sent a French military carrier to New York to get his nation's gold back, but when the Germans attempted to repatriate their gold, the United States had decided it had had enough. Gold reserves were running low, and on August 15, 1971, President Richard Nixon announced the end

of dollar convertibility to gold, thus letting the gold price float in the market freely. In effect, the United States had defaulted on its commitment to redeem its dollars in gold. The fixed exchange rates between the world's currencies, which the IMF was tasked with maintaining, had now been let loose to be determined by the movement of goods and capital across borders and in ever-more-sophisticated foreign exchange markets.

Freed from the final constraints of the pretense of gold redemption, the U.S. government expanded its monetary policy in unprecedented scale, causing a large drop in the purchasing power of the dollar, and a rise in prices across the board. Everyone and everything was blamed for the rise in prices by the U.S. government and its economists, except for the one actual source of the price rises, the increase in the supply of the U.S. dollar. Most other currencies fared even worse, as they were the victim of inflation of the U.S. dollars backing them, as well as the inflation by the central banks issuing them.

This move by President Nixon completed the process begun with World War I, transforming the world economy from a global gold standard to a standard based on several government-issued currencies. For a world that was growing increasingly globalized along with advancements in transportation and telecommunications, freely fluctuating exchange rates constituted what Hoppe termed "a system of partial barter."[13] Buying things from people who lived on the other side of imaginary lines in the sand now required utilizing more than one medium of exchange and reignited the age-old problem of lack of coincidence of wants. The seller does not want the currency held by the buyer, and so the buyer must purchase another currency first, and incur conversion costs. As advances in transportation and telecommunications continue to increase global economic integration, the cost of these inefficiencies just keeps getting bigger. 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.

While most governments produce their own currencies, the U.S. government was the one that produced the prime reserve currency with

[13]Hans-Hermann Hoppe, "How Is Fiat Money Possible?" *Review of Austrian Economics*, vol. 7, no. 2 (1994).

which other governments backed theirs. This was the first time in human history that the entire planet had run on government money, and while 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. Governments around the world did this after abandoning the gold standard, as did Bitcoin's creator, with contrasting results. After the link between fiat money and gold was severed, paper monies have had a higher growth in their supply rate than gold, and as a result have seen a collapse in their value compared to gold. The total U.S. M2 measure of the money supply in 1971 was around $600 billion, while today it is in excess of $12 trillion, growing at an average annual rate of 6.7%. Correspondingly, in 1971, 1 ounce of gold was worth $35, and today it is worth more than $1,200.

Looking at the track record of government money paints a mixed picture about the stock-to-flow ratio of different currencies across time. The relatively stable and strong currencies of the developed countries have usually had growth rates in the single digits, but with a much higher variance, including contractions of the supply during deflationary recessions.[14] Developing country currencies have at many times experienced supply growth rates closer to those of consumable commodities, leading to disastrous hyperinflation and the destruction of the wealth of holders. The World Bank provides data on broad money growth for 167 countries for the period between 1960 and 2015. The data for the annual average for all countries is plotted in Figure 6. While the data is not complete for all countries and all years, the average growth of money supply is 32.16% per year per country.

The 32.16% figure does not include several hyperinflationary years during which a currency is completely destroyed and replaced by a new one, and so the results of this analysis cannot definitively tell us which currencies fared worst, as some of the most significant data cannot be

[14]This is an important but often underappreciated feature of government money. Because banks create money when they issue loans, the repayment of loans or the bankruptcy of the borrower leads to a reduction in the money supply. Money can have its supply increase or decrease depending on a variety of government and central bank decisions.

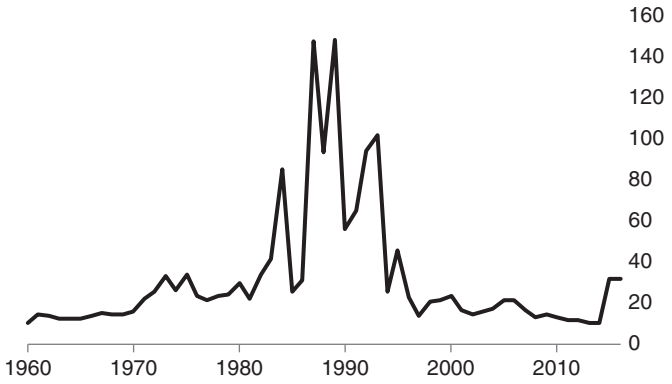

Figure 6 Broad money average annual growth rate for 167 currencies, 1960–2015.

Table 3 The Ten Countries with Highest Average Annual Broad Money Supply Growth, 1960–2015

Country	Average
Nicaragua	480.24
Congo, Dem. Rep.	410.92
Angola	293.79
Brazil	266.57
Peru	198.00
Bolivia	184.28
Argentina	148.17
Ukraine	133.84
Azerbaijan	109.25
Armenia	100.67

compared. But a look at the countries that have had the highest average increase of the money supply will show a list of countries that had several highly publicized episodes of inflationary struggle throughout the period covered. Table 3[15] shows the ten countries with the highest annual average increase in the money supply.

During hyperinflationary periods, people in developing countries sell their national currency and buy durable items, commodities, gold,

[15] *Source*: World Bank.

Table 4 Average Annual Percent Increase in Broad Money Supply for the Ten Largest Global Currencies

	Annual Money Supply Growth Rate	
Country/Region	**1960–2015**	**1990–2015**
United States	7.42	5.45
Euro Area (19 countries)		5.55
Japan	10.27	1.91
United Kingdom	11.30	7.28
Australia	10.67	9.11
Canada	11.92	10.41
Switzerland	6.50	4.88
China	21.82	20.56
Sweden	7.94	6.00
New Zealand	12.30	6.78

and foreign currencies. International reserve currencies, such as the dollar, euro, yen, and Swiss franc, are available in most of the world, even if in black markets, and meet a significantly high portion of the global demand for a store of value. The reason for that becomes apparent when one examines the rates of growth of their supply, which have been relatively low over time. Seeing as they constitute the main store-of-value options available for most people around the world, it is worth examining their supply growth rates separately from the less stable currencies. The current ten largest currencies in the foreign exchange markets are listed in Table 4, along with their annual broad money supply increase for the periods between 1960–2015 and 1990–2015.[16] The average for the ten most internationally liquid currencies is 11.13% for the period 1960–2015, and only 7.79% for the period between 1990 and 2015. This shows that the currencies that are most accepted worldwide, and have the highest salability globally, have a higher stock-to-flow ratio than the other currencies, as this book's analysis would predict.

The period of the 1970s and 1980s, which contained the beginning of the floating national currencies era, was one in which most countries experienced high inflation. Things got better after 1990, and

[16] *Source*: World Bank for all countries, and OECD.Stat for Euro area.

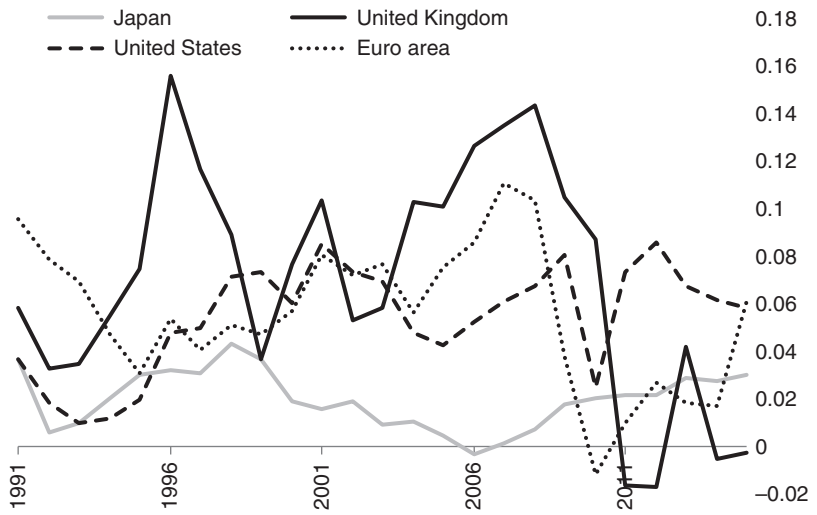

Figure 7 Annual broad money growth rate in Japan, U.K., United States, and Euro area.

average supply growth rates dropped. OECD data shows that for OECD countries over the period between 1990 and 2015, annual broad money supply growth rate averaged 7.17%.

We can see that the world's major national currencies generally have their supply grow at predictably low rates. Developed economies have had slower increases in the supply of their currencies than developing economies, which have witnessed faster price rises and several hyperinflationary episodes in recent history. The advanced economies have had their broad money grow at rates usually between 2% and 8%, averaging around 5%, and rarely climbing into double digits or dropping into negative territory. Developing countries have far more erratic growth rates, which fluctuate into the double digits, sometimes triple digits, and sometimes even quadruple digits, while occasionally dropping into negative territory, reflecting the higher financial instability in these countries and currencies. (See Figure 7.[17])

Growth at 5% per year may not sound like much, but it will double the money supply of a country in only 15 years. This was the reason

[17] *Source*: OECD.Stat.

silver lost out in the monetary race to gold, whose lower supply growth rate meant a far slower erosion of purchasing power.

Hyperinflation is a form of economic disaster unique to government money. There was never an example of hyperinflation with economies that operated a gold or silver standard, and even when artifact money like seashells and beads lost its monetary role over time, it usually lost it slowly, with replacements taking over more and more of the purchasing power of the outgoing money. But with government money, whose cost of production tends to zero, it has become quite possible for an entire society to witness all of its savings in the form of money disappear in the space of a few months or even weeks.

Hyperinflation is a far more pernicious phenomenon than just the loss of a lot of economic value by a lot of people; it constitutes a complete breakdown of the structure of economic production of a society built up over centuries and millennia. With the collapse of money, it becomes impossible to trade, produce, or engage in anything other than scraping for the bare essentials of life. As the structures of production and trade that societies have developed over centuries break down due to the inability of consumers, producers, and workers to pay one another, the goods which humans take for granted begin to disappear. Capital is destroyed and sold off to finance consumption. First go the luxury goods, but soon follow the basic essentials of survival, until humans are brought back to a barbaric state wherein they need to fend for themselves and struggle to secure the most basic needs of survival. As the individual's quality of life degenerates markedly, despair begins to turn to anger, scapegoats are sought, and the most demagogic and opportunistic politicians take advantage of this situation, stoking people's anger to gain power. The most vivid example of this is inflation of the Weimar Republic in the 1920s, which not only led to the destruction and breakdown of one of the world's most advanced and prosperous economies, but also fueled the rise of Adolf Hitler to power.

Even if the textbooks were correct about the benefits of government management of the money supply, the damage from one episode of hyperinflation anywhere in the world far outweighs them. And the century of government money had far more than one of these calamitous episodes.

As these lines are written, it is Venezuela's turn to go through this travesty and witness the ravages of the destruction of money, but this is a process that has occurred 56 times since the end of World War I, according to research by Steve Hanke and Charles Bushnell, who define hyperinflation as a 50% increase in the price level over a period of a month. Hanke and Bushnell have been able to verify 57 episodes of hyperinflation in history,[18] only one of which occurred before the era of monetary nationalism, and that was the inflation in France in 1795, in the wake of the Mississippi Bubble, which was also produced through government money and engineered by the honorary father of modern government money, John Law.

The problem with government-provided money is that its hardness depends entirely on the ability of those in charge to not inflate its supply. Only political constraints provide hardness, and there are no physical, economic, or natural constraints on how much money government can produce. Cattle, silver, gold, and seashells all require serious effort to produce them and can never be generated in large quantities at the drop of a hat, but government money requires only the fiat of the government. The constantly increasing supply means a continuous devaluation of the currency, expropriating the wealth of the holders to benefit those who print the currency, and those who receive it earliest.[19] History has shown that governments will inevitably succumb to the temptation of inflating the money supply. Whether it's because of downright graft, "national emergency," or an infestation of inflationist schools of economics, government will always find a reason and a way to print more money, expanding government power while reducing the wealth of the currency holders. This is no different from copper producers mining more copper in response to monetary demand for copper; it rewards the producers of

[18]Steve Hanke and Charles Bushnell, "Venezuela Enters the Record Book: The 57th Entry in the Hanke-Krus World Hyperinflation Table," *Studies in Applied Economics*, no. 69 (December 2016).

[19]This is termed the Cantillon Effect, after the Irish-French economist Richard Cantillon, who explained it in the eighteenth century. According to Cantillon, the beneficiaries from the expansion of 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 facing a small increase in the price level. As the money is spent more, the price level rises, until the later recipients suffer a reduction in their real purchasing power. This is the best explanation for why inflation hurts the poorest and helps the richest in the modern economy. Those who benefit from it most are the ones with the best access to government credit, and the ones who are hurt the most are those on fixed incomes or minimum wages.

the monetary good, but punishes those who choose to put their savings in copper.

Should a currency credibly demonstrate its supply cannot be expanded, it would immediately gain value significantly. In 2003, when the United States invaded Iraq, 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 no central bank could print it anymore.[20] A similar story happened to Somali shillings after their central bank was destroyed.[21] Money is more desirable when demonstrably scarce than when liable to being debased.

A few reasons keep government money as the prime money of our time. First, governments mandate that taxes are paid in government money, which means individuals are highly likely to accept it, giving it an edge in its salability. Second, government control and regulation of the banking system means that banks can only open accounts and transact in government-sanctioned money, thus giving government money a much higher degree of salability than any other potential competitor. Third, legal tender laws make it illegal in many countries to use other forms of money for payment. Fourth, all government moneys are still backed by gold reserves, or backed by currencies backed by gold reserves. According to data from the World Gold Council, central banks currently have around 33,000 tons of gold in their reserves. Central bank gold reserves rose quickly in the early part of the twentieth century as many governments confiscated their people's and banks' gold and forced them to use their money. In the late 1960s, with the Bretton Woods system straining under the pressure of increased money supply, governments began to offload some of their gold reserves. But in 2008 that trend reversed and central banks returned to buying gold and the global supply has increased. It is ironic, and very telling, that in the era of government money, governments themselves own far more gold in their official reserves than they did under the international gold standard of 1871–1914. Gold has clearly not lost its monetary role; it

[20] "Dollar or Dinar?" *Mises Daily*. Available at https://mises.org/library/dollar-or-dinar

[21] J. P. Koning, "Orphaned Currency: Odd Case of Somali Shillings." Available at https://jpkoning.blogspot.ca/2013/03/orphaned-currency-odd-case-of-somali.html?m=1

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 no counterparty risk. Access to its monetary role, however, has been restricted to central banks, while individuals have been directed toward using government money.

Central banks' large reserves of gold can be used as an emergency supply to sell or lease on the gold market to prevent the price of gold from rising during periods of increased demand, to protect the monopoly role of government money. As Alan Greenspan once explained: "Central banks stand ready to lease gold in increasing quantities should the price rise."[22] (See Figure 4.[23])

As technology has progressed to allow for ever-more-sophisticated forms of money, including paper money that is easy to carry around, a new problem of salability has been introduced, and that is the ability of the seller to sell her good without the intervention of any third parties that might place restraints on the salability of that money. This is not an issue that exists with commodity moneys, whose market value is emergent from the market and cannot be dictated by third parties to the transaction: cattle, salt, gold, and silver all have a market and willing buyers. But with government-issued money with negligible value as a commodity, salability can be compromised by the governments that issued it, declaring it no longer suitable as legal tender. Indians who woke up on November 8, 2016, to hear that their government had suspended 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 lines. And as more of the world heads toward reducing its reliance on cash, more of people's money is being placed in government-supervised banks, making it vulnerable to confiscation or capital controls. The fact that these procedures generally happen during times of economic crisis, when individuals need that money most, is a major impediment to the salability of government-issued money.

[22] "Regulation of OTC Derivatives." Testimony of Chairman Alan Greenspan before the Committee on Banking and Financial Services, U.S. House of Representatives, July 24, 1998.

[23] *Source*: World Gold Council, Reserve Statistics. Available at: https://www.gold.org/data/gold-reserves

Government control of money has turned money from being the reward for producing value to the reward for obedience to government officials. It is impractical for anyone to develop wealth in government money without government acceptance. Government can confiscate money from the banking monopolies it controls, inflate the currency to devalue holders' wealth and reward it to the most loyal of its subjects, impose draconian taxes and punish those who avoid them, and even confiscate bills.

Whereas in 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 the twentieth century, government control of money has meant a new and very important criterion being added to salability, and that is the salability of money according to the will of its holder and not some other party. Combining these criteria together formulates a complete understanding of the 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 on the free market and not any other third party.

While a staunch defender of the role of gold as money during his time, Ludwig von Mises understood that this monetary role was not something inherent or intrinsic to gold. As one of the deans of the Austrian tradition in economics, Mises well understood that value does not exist outside of human consciousness, and that metals and substances had nothing inherent to them that could assign to them a monetary role. For Mises, gold's monetary status was due to its fulfillment of the criteria for sound money as he understood them:

> [T]he 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.[24]

Sound money, then, according to Mises, is what the market freely chooses to be money, and what remains under the control of its owner,

[24]Ludwig von Mises, *The Theory of Money and Credit*, 2nd ed. (Irvington-on-Hudson, NY: Foundation for Economic Education, 1971), pp. 414–416.

safe from coercive meddling and intervention. For as long as the money was controlled by anyone other than the owner, whoever controlled it would always face too strong an incentive to pilfer the value of the money through inflation or confiscation, and to use it as a political tool to achieve their political goals at the expanse of the holders. This, in effect, takes wealth away from people who produce it and gives it to people who specialize in the control of money without actually producing things valued by society, in the same way European traders could pilfer African society by flooding them with cheap beads as mentioned in Chapter 2. No society could prosper when such an avenue for riches remained open, at the cost of impoverishing those who seek productive avenues for wealth. A sound money, on the other hand, makes service valuable to others the only avenue open for prosperity to anyone, thus concentrating society's efforts on production, cooperation, capital accumulation, and trade.

The twentieth century was the century of unsound money and the omnipotent state, as a market choice in money was denied by government diktat, and government-issued paper money was forced on people with the threat of violence. As time passed, governments moved away from sound money ever more as their spending and deficits increased, their currencies continuously devalued, and an ever-larger share of national income was controlled by the government. With 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, which would prosper the more they spent. The work of monetary cranks like John Maynard Keynes taught in modern universities the notion that government spending only has benefits, never costs. The government, after all, can always print money and so faces no real constraints on its spending, which it can use to achieve whichever goal the electorate sets for it.

For those who worship government power and take joy in totalitarian control, such as the many totalitarian and mass-murdering regimes of the twentieth century, this monetary arrangement was a godsend. But for those who valued human liberty, peace, and cooperation among humans, it was a depressing time with the prospects of economic reform receding ever more with time and the prospects of the political process ever

returning us to monetary sanity becoming an increasingly fanciful dream. As Friedrich Hayek put it:

> I don't believe we shall ever have a good money again before we take the thing out of the hands of government, that is, we can't take it 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]

Speaking in 1984, completely oblivious to the actual form of this "something they can't stop", Friedrich Hayek's prescience sounds outstanding today. Three decades after he uttered these words, and a whole century after governments destroyed the last vestige of sound money that was the gold standard, individuals worldwide have the chance to save and transact with a new form of money, chosen freely on the market and outside government control. In its infancy, 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.

[25] Excerpt from a video interview conducted in 1984 with James U. Blanchard at the University of Freiburg.

Chapter 5

Money and Time Preference

Sound money is chosen freely on the market for its salability, because it holds its value across time, because it can transfer value effectively across space, and because it can be divided and grouped into small and large scales. It is money whose supply cannot be manipulated by a coercive authority that imposes its use on others. From the preceding discussion, and from the understanding of monetary economics afforded to us by Austrian economics, the importance of sound money can be explained for three broad reasons: first, it protects value across time, which gives people a bigger incentive to think of their future, and lowers their time preference. The lowering of the time preference is what initiates the process of human civilization and allows for humans to cooperate, prosper, and live in peace. Second, sound money allows for trade to be based on a stable unit of measurement, facilitating ever-larger markets, free from government control and coercion, and with free trade comes peace and prosperity. Further, a unit of

account is essential for all forms of economic calculation and planning, and unsound money makes economic calculation unreliable and is the root cause of economic recessions and crises. Finally, sound money is an essential requirement for individual freedom from despotism and repression, as the ability of a coercive state to create money can give it undue power over its subjects, power which by its very nature will attract the least worthy, and most immoral, to take its reins.

Sound money is a prime factor in determining individual *time preference*, an enormously important and widely neglected aspect of individual decision making. Time preference refers to the ratio at which individuals value the present compared to the future. Because humans do not live eternally, death could come to us at any point in time, making the future uncertain. And because consumption is necessary for survival, people always value present consumption more than future consumption, as the lack of present consumption could make the future never arrive. In other words, time preference is positive for all humans; there is always a discount on the future compared to the present.

Further, because more goods can be produced with time and resources, rational individuals would always prefer to have a given quantity of resources in the present than in the future, as they could use them to produce more. For an individual to be willing to defer her receipt of a good by a year, she would have to be offered a larger quantity of the good. The increase necessary to tempt an individual to delay her receipt of the good is what determines her time preference. All rational individuals have a nonzero time preference, but the time preference varies from one individual to another.

Animals' time preference is far higher than humans', as they act to the satisfaction of their immediate instinctive impulses and have little conception of the future. A few animals are capable of building nests or homes that can last for the future, and these have a lower time preference than the animals that act to the satisfaction of their immediate needs such as hunger and aggression. Human beings' lower time preference allows us to curb our instinctive and animalistic impulses, think of what is better for our future, and act rationally rather than impulsively. Instead of spending all our time producing goods for immediate consumption, we can choose to spend time engaged in production of goods that will take longer to complete, if they are superior goods. As humans reduce

their time preference, they develop the scope for carrying out tasks over 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, to create *capital goods*.

Whereas animals and humans can both hunt, humans differentiated themselves from animals by spending time developing tools for hunting. Some animals may occasionally use a tool in hunting another animal, but they have no capacity for owning these tools and maintaining them for long-term use. Only through a lower time preference can a human decide to take time away from hunting and dedicate that time to building a spear or fishing rod that cannot be eaten itself, but can allow him to hunt more proficiently. This is the essence of *investment*: as humans delay immediate gratification, they invest their time and resources in the production of capital goods which will make production more sophisticated or technologically advanced and extend it over a longer time-horizon. The only reason that an individual would choose to delay his gratification to engage in risky production over a longer period of time is that these longer processes will generate more output and superior goods. In other words, *investment raises the productivity of the producer.*

Economist Hans-Hermann Hoppe explains that once time preference drops enough to allow for any savings and capital or durable consumer-goods formation at all, the tendency is for time preference to drop even further as a "process of civilization" is initiated.[1]

The fisherman who builds a fishing rod is able to catch more fish per hour than the fisherman hunting with his bare hands. But the only way to build the fishing rod is to dedicate an initial amount of time to work that does not produce edible fish, but instead produces a fishing rod. This is an uncertain process, for the fishing rod might not work and the fisherman will have wasted his time to no avail. Not only does investment require delaying gratification, it also always carries with it a risk of failure, which means the investment will only be undertaken with an expectation of a reward. The lower an individual's time preference, the more likely he is to engage in investment, to delay gratification, and

[1]Hans-Hermann Hoppe, *Democracy: The God That Failed*, p. 6.

to accumulate capital. The more capital is accumulated, the higher the productivity of labor, and the longer the time horizon of production.

To understand the difference more vividly, contrast two hypothetical individuals who start off with nothing but their bare hands, and differing time preferences: Harry has a higher time preference than Linda. Harry chooses to only spend his time catching fish with his hands, needing about eight hours a day to catch enough fish to feed himself for the day. Linda, on the other hand, having a lower time preference, spends only six hours catching fish, making do with a smaller amount of fish every day, and spends the other two hours working on building a fishing rod. After a week has passed, Linda has succeeded in building a working fishing rod. In the second week, she can catch in eight hours double the quantity of fish which Harry catches. Linda's investment in the fishing rod could allow her to work for only four hours a day and eat the same amount of fish Harry eats, but because she has a lower time preference, she will not rest on her laurels. She will instead spend four hours catching as many fish as Harry catches in eight hours, and then spend another four hours engaged in further capital accumulation, building herself a fishing boat, for instance. A month later, Linda has a fishing rod and a boat that allows her to go deeper into the sea, to catch fish that Harry had never even seen. Linda's productivity is not just higher per hour; her fish are different from, and superior to, the ones Harry catches. She now only needs one hour of fishing to secure her food for a day, and so she dedicates the rest of her time to even more capital accumulation, building better and bigger fishing rods, nets, and boats, which in turn increases her productivity further and improves the quality of her life.

Should Harry and his descendants continue to work and consume with the same time preference, they will continue to live the same life he lived, with the same level of consumption and productivity. Should Linda and her descendants continue with the same lower time preference, they will continuously improve their quality of life over time, increasing their stock of capital and engaging in labor with ever-higher levels of productivity, in processes that take far longer to complete. The real-life equivalents of the descendants of Linda would today be the owners of *Annelies Ilena*, the world's largest fishing trawler. This formidable machine took decades to conceive, design, and build before it was completed in the year 2000, and it will continue to operate for decades to

offer the lower-time-preference investors in it a return on the capital they provided to the building process many decades ago. The process of producing fish for Linda's descendants has become so long and sophisticated it takes decades to complete, whereas Harry's descendants still complete their process in a few hours every day. The difference, of course, is that Linda's descendants have vastly higher productivity than Harry's, and that's what makes engaging in the longer process worthwhile.

An important demonstration of the importance of time preference comes from the famous Stanford marshmallow experiment,[2] conducted in the late 1960s. Psychologist Walter Mischel would leave children in a room with a piece of marshmallow or a cookie, and tell the kids they were free to have it if they wanted, but that he will come back in 15 minutes, and if the children had not eaten the candy, he would offer them a second piece as a reward. In other words, the children had the choice between the immediate gratification of a piece of candy, or delaying gratification and receiving two pieces of candy. This is a simple way of testing children's time preference: students with a lower time preference were the ones who could wait for the second piece of candy, whereas the students with the higher time preference could not. Mischel followed up with the children decades later and found significant correlation between having a low time preference as measured with the marshmallow test and good academic achievement, high SAT score, low body mass index, and lack of addiction to drugs.

As an economics professor, I make sure to teach the marshmallow experiment in every course I teach, as I believe it is the single most important lesson economics can teach to individuals, and am astounded that university curricula in economics have almost entirely ignored this lesson, to the point that many academic economists have no familiarity with the term *time preference* altogether or its significance.

While microeconomics has focused on transactions between individuals, and macroeconomics on the role of government in the economy, the reality is that the most important economic decisions to any individual's well-being are the ones they conduct in their trade-offs with their future self. Every day, an individual will conduct a few

[2]Walter Mischel, Ebbe B. Ebbesen, and Antonette Raskoff Zeiss, "Cognitive and Attentional Mechanisms in Delay of Gratification," *Journal of Personality and Social Psychology*, vol. 21, no. 2 (1972): 204–218.

economic transactions with other people, but they will partake in a far larger number of transactions with their future self. The examples of these trades are infinite: 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; or, my favorite example to use in class: deciding to study the course material every week of the semester rather than cramming the night before the final exam.

In each of these examples, there is nobody forcing the decision on the individual, and the prime beneficiary or loser from the consequences of these choices is the individual himself. The main factor determining a man's choices in life is his time preference. While people's time preference and self-control will vary from one situation to the other, in general, a strong correlation can be found across all aspects of decision making. The sobering reality to keep in mind is that a man's lot in life will be largely determined by these trades between him and his future self. As much as he'd like to blame others for his failures, or credit others with his success, the infinite trades he took with himself are likely to be more significant than any outside circumstances or conditions. No matter how circumstances conspire against the man with a low time preference, he will probably find a way to keep prioritizing his future self until he achieves his objectives. And no matter how much fortune favors the man with a high time preference, he will find a way to continue sabotaging and shortchanging his future self. The many stories of people who have triumphed against all odds and unfavorable circumstances stand in stark contrast to the stories of people blessed with skills and talent that rewarded them handsomely, who nonetheless managed to waste all that talent and achieve no lasting good for themselves. Many professional athletes and entertainers, gifted with talents that earn them large sums of money, nevertheless die penniless as their high time preference gets the better of them. On the other hand, many ordinary people with no special talents work diligently and save and invest for a lifetime to achieve financial security and bequeath their children a life better than the one they inherited.

It is only through the lowering of time preference that individuals begin to appreciate investing in the long run and start prioritizing future

outcomes. A society in which individuals bequeath their children more than what they received from their parents is a civilized society: it is a place where life is improving, and people live with a purpose of making the next generation's lives better. As society's capital levels continue to increase, productivity increases and, along with it, quality of life. The security of their basic needs assured, and the dangers of the environment averted, people turn their attention toward more profound aspects of life than material well-being and the drudgery of work. They cultivate families and 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 about what capital accumulation allows humans to achieve, the flourishing and freedom to seek higher meaning in life when their base needs are met and most pressing dangers averted.

There are many factors that come into play in determining the time preference of individuals.[3] Security of people in their person and property is arguably one of the most important. Individuals who live in areas of conflict and crime will have a significant chance of losing their life and are thus likely to more highly discount the future, resulting in a higher time preference than those who live in peaceful societies. Security of property is another major factor influencing individuals' time preference: societies where governments or thieves are likely to expropriate individuals' property capriciously would have higher time preference, as such actions would drive individuals to prioritize spending their resources on immediate gratification rather than investing them in property which could be appropriated at any time. Tax rates will also adversely affect time preference: the higher the taxes, the less of their income that individuals are allowed to keep; this would lead to individuals working less at the margin and saving less for their future, because the burden of taxes is more likely to reduce savings than consumption, particularly for those with a low income, most of which is needed for basic survival.

The factor affecting time preference that is most relevant to our discussion, however, is the expected future value of money. In a free market

[3]The reader is referred to the first chapter of Hoppe's *Democracy: The God That Failed* for an excellent discussion of these factors. More foundational and technical discussions can be found in Chapter 6 of Murray Rothbard's *Man, Economy, and State*, Chapters 18 and 19 in Mises' *Human Action*, and Eugen von Böhm-Bawerk's *Capital and Interest.*

where people are free to choose their money, they will choose the form of money most likely to hold its value over time. The better the money is at holding its value, the more it incentivizes people to delay consumption and instead dedicate resources for production in the future, leading to capital accumulation and improvement of living standards, while also engendering in people a low time preference in other, non-economic aspects of their life. 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 than any short-term gains from conflict. People develop a strong sense of morality, prioritizing the moral choices that will cause the best long-term outcomes for them and their children. A person who thinks of the long run is less likely to cheat, lie, or steal, because the reward for such activities may be positive in the short run, but can be devastatingly negative in the long run.

The reduction in the purchasing power of money is similar to a form of taxation or expropriation, reducing the real value of one's money even while the nominal value is constant. In modern economies government-issued money is inextricably linked to artificially lower interest rates, which is a desirable goal for modern economists because it promotes borrowing and investing. But the effect of this manipulation of the price of capital is to artificially reduce the interest rate that accrues to savers and investors, as well as the one paid by borrowers. The natural implication of this process is to reduce savings and increase borrowing. At the margin, individuals will consume more of their income and borrow more against the future. This will not just have implications on their time preference in financial decisions; it will likely reflect on everything in their lives.

The move from money that holds its value or appreciates to money that loses its value is very significant in the long run: society saves less, accumulates less capital, and possibly begins to consume its capital; worker productivity stays constant or declines, resulting in the stagnation of real wages, even if nominal wages can be made to increase through the magical power of printing ever more depreciating pieces of paper money. As people start spending more and saving less, they become more present-oriented in all their decision making, resulting in

moral failings and a likelihood to engage in conflict and destructive and self-destructive behavior.

This helps explain why civilizations prosper under a sound monetary system, but disintegrate when their monetary systems are debased, as was the case with the Romans, the Byzantines, and modern European societies. The contrast between the nineteenth and twentieth centuries can be understood in the context of the move away from sound money and all the attendant problems that creates.

Monetary Inflation

The simple reality, demonstrated throughout history, is that any person who finds a way to create the monetary medium will try to do it. The temptation to engage in this is too strong, but the creation of the monetary medium is not an activity that is productive to society, as any supply of money is sufficient for any economy of any size. The more that a monetary medium restrains this drive for its creation, the better it is as a medium of exchange and stable store of value. Unlike all other goods, money's functions as a medium of exchange, store of value, and unit of account are completely orthogonal to its quantity. What matters in money is its purchasing power, not its quantity, and as such, any quantity of money is enough to fulfil the monetary functions, as long as it is divisible and groupable enough to satisfy holders' transaction and storage needs. Any quantity of economic transactions could be supported by a money supply of any size as long as the units are divisible enough.

A theoretically ideal money would be one whose supply is fixed, meaning nobody could produce more of it. The only noncriminal way to acquire money in such a society would be to produce something of value to others and exchange it with them for money. As everyone seeks to acquire more money, everyone works more and produces more, leading to improving material well-being for everyone, which in turn allows people to accumulate more capital and increase their productivity. Such a money would also work perfectly well as a store of value, by preventing others from increasing the money supply; the wealth stored into it would not depreciate over time, incentivizing people to save and allowing them to think more of the future. With growing wealth and productivity and

an increased ability to focus on the future, people begin to reduce their time preference and can focus on improving non-material aspects of their life, including spiritual, social, and cultural endeavors.

It had, however, proved impossible to come up with a form of money of which more cannot be created. Whatever gets chosen as a medium of exchange will appreciate in value and lead to more people trying to produce more of it. 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, and thus make its creation not a good source of profit. Seeing as gold is indestructible, it is the one metal whose stockpiles have only been growing since the first human mined it. Seeing as this mining has been going on for thousands of years, and alchemy has yet to prove large-scale commercial viability, new mining supply continues to be a reliably tiny fraction of existing stockpiles.

This property is why gold has been synonymous with sound money: it is money whose supply is guaranteed, thanks to the ironclad rules of physics and chemistry, to never be significantly increased. Try as they might, humans have for centuries failed to produce a form of money more sound than gold, and that is why it has been the prime monetary instrument used by most human civilizations throughout history. Even as the world has transitioned to government money as a store of value, medium of exchange, and unit of account, governments themselves continue to hold a significant percentage of their reserves in gold, constituting a significant percentage of total gold supply.

Keynes complained about goldmining being a wasteful activity that consumed a lot of resources while adding nothing to real wealth. While his critique does contain a kernel of truth, in the sense that increasing the supply of the monetary medium does not increase the wealth of the society using it, he misses the point that gold's monetary role is a result of it being the metal likely to attract the *least* human and capital resources toward its mining and prospecting, compared to all others. Because the supply of gold can only be increased by very small quantities, even with price spikes, and as gold is very rare and difficult to find, mining monetary gold would be less profitable than mining any other metal assuming a monetary role, leading to the least amount of human time and resources going to mining it. Were any other metal used as the monetary medium, whenever society's time preference drops and more people

purchase the metal for savings, raising its price, there would be a significant opportunity for profit in producing more of the metal. Because the metal is perishable, the new production will always be far larger (relative to gold) as a percentage of existing stockpiles, as in the copper example above, bringing the price down and devaluing the savings of the holders. In such a society, savings would be effectively stolen from savers to reward people who engage in mining metals at quantities far beyond their economic use. Little saving and useful production would take place in such a society, impoverishment would ensue from the obsession with producing monetary media, and the society would be ripe for being overtaken and conquered by more productive societies whose individuals have better things to do than produce more monetary media.

The 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 cannot be inflated easily and because it forces people to direct their energies away from producing a monetary good and toward producing more useful goods and services. This helps explain why Arab polymath Ibn Khaldun referred to gold prospecting and mining as the least respectable of professions, after kidnapping for ransom.[4] The 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. But the folly is doubly compounded by Keynes's "solution" to this shortcoming of gold being to propose a fiat monetary standard which has ended up dedicating far more human time, labor, and resources toward the management of the issuance of the money supply and the profiting from it. Never in the history of gold as a monetary medium did it employ as many miners and workers as today's central banks and all the associated banks and businesses profiting from having close access to the monetary printing presses, as will be discussed in Chapter 7.

When new supply is insignificant compared to existing supply, the market value of a form of money is determined through people's willingness to hold money and their desire to spend it. Such factors will vary significantly with time for each individual, as individuals' personal circumstances go from periods where they prioritize holding a lot of

[4]Ibn Khladun, *Al-Muqaddima*.

money to periods of holding less. But in the aggregate, they will vary slightly for society as a whole, because money is the market good with the least diminishing *marginal utility*. One of the fundamental laws of economics is the law of diminishing marginal utility, which means that acquiring more of any good reduces the marginal utility of each extra unit. Money, which is held not for its own sake, but for the sake of being exchanged with other goods, will have its utility diminish slower than any other good, because it can always be exchanged for any other good. As an individual's holdings of houses, cars, TVs, apples, or diamonds increases, the marginal valuation they put on each extra unit decreases, leading to a decreasing desire to accumulate more of each. But more money is not like any of these goods, because as more of it is held, the holder can simply exchange the money for more of the next good they value the most. The marginal utility of money does in fact decline, as evidenced by the fact that an extra dollar of income means a lot more to a person whose daily income is $1 than one whose daily income is $1,000. But money's marginal utility declines far slower than any other good, because it declines along with the utility of wanting any good, not one particular good.

The slowly declining marginal utility of holding money means demand for money at the margin will not vary significantly. Combining this with an almost constant supply results in a relatively stable market value for money in terms of goods and services. This means money is unlikely to appreciate or depreciate significantly, making it a lousy long-term investment but a good store of value. An investment would be expected to have a significant appreciation potential, but also carry a significant risk of loss or depreciation. Investment is a reward for taking risk, but sound money, having the least risk, offers no reward.

In the aggregate, demand for money will likely vary only with variance in time preference. As people develop a lower time preference overall, more people are likely to want to hold money, causing a rise in its market value compared to other goods and services, further rewarding its holders. A society that develops a higher time preference, on the other hand, would tend to decrease its holdings of money, slightly dropping its market value at the margin. In either case, holding money would remain the least risky and rewarding asset overall, and that in essence is the root cause for demand for it.

This analysis helps explain the remarkable ability of gold to hold its value over years, decades, and centuries. Observing prices of agricultural commodities in the Roman empire in terms of grams of gold shows they bear remarkable similarity to prices today. Examining Diocletian's edict[5] of prices from 301 AD and converting gold prices to their modern-day U.S. dollar equivalent, we find that a pound of beef cost around $4.50, while a pint of beer cost around $2, a pint of wine around $13 for high quality wine and $9 for lower quality, and a pint of olive oil cost around $20. Comparisons of various data for salaries of certain professions shows similar patterns, but these individual data points, while indicative, cannot be taken as a definitive settlement of the question.

Roy Jastram has produced a systematic study of the purchasing power of gold over the longest consistent datasets available.[6] Observing English data from 1560 to 1976 to analyze the change in gold's purchasing power in terms of commodities, Jastram finds gold dropping in purchasing power during the first 140 years, but then remaining relatively stable from 1700 to 1914, when Britain went off the gold standard. For more than two centuries during which Britain primarily used gold as money, its purchasing power remained relatively constant, as did the price of wholesale commodities. After Britain effectively went off the gold standard in the wake of World War I, the purchasing power of gold increased, as did the index of wholesale prices. (See Figure 8.[7])

It's important to understand that for a monetary medium to remain perfectly constant in value is not even theoretically possible or determinable. Goods and services which money purchases will change over time as new technologies introduce new goods that replace old ones, and as the conditions of supply and demand of different goods will vary over time. One of the prime functions of the monetary unit is to serve as the unit of measure for economic goods, whose value is constantly changing. It is thus not possible to satisfactorily measure the price of a monetary good precisely, although over long time horizons, studies similar to Jastram's can be indicative of an overall trend for a medium of

[5] R. Kent, "The Edict of Diocletian Fixing Maximum Prices," *University of Pennsylvania Law Review*, vol. 69 (1920): 35.
[6] Roy Jastram, *The Golden Constant: The English and American Experience 1560–2007* (Cheltenham, UK: Edward Elgar, 2009).
[7] *Source*: Jastram, *The Golden Constant*.

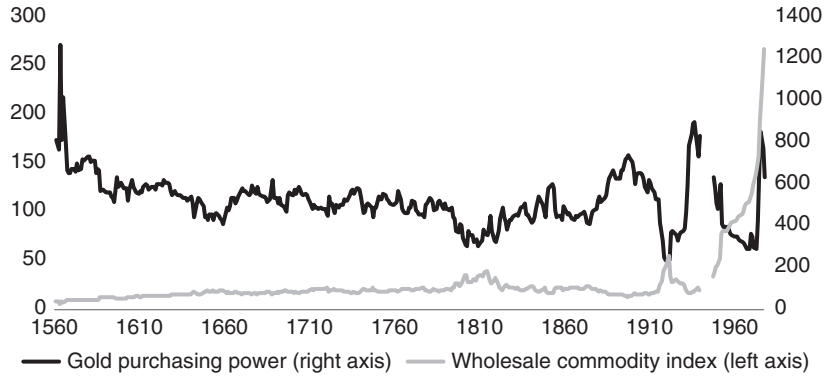

Figure 8 Purchasing power of gold and wholesale commodity index in England, 1560–1976.

exchange to hold its value, particularly when compared to other forms of money.

More recent data from the United States, focused on the last two centuries, which witnessed faster economic growth than the period covered in Jastram's data, shows that gold has even increased in value in terms of commodities, whose prices rose dramatically in terms of U.S. dollars. This is perfectly consistent with gold being the hardest money available. 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, causing a rise in gold's purchasing power over time. As can be seen in Figure 9,[8] the U.S. dollar was also gaining value against commodities whenever it was tied to gold, but lost value significantly when its connection to gold was severed, as was the case during the U.S. Civil War and the printing of greenbacks, and in the period after the 1934 devaluation of the dollar and confiscation of citizen gold.

The period between 1931 and 1971 was one in which money was nominally linked to gold, but only through various government arrangements that allowed for the exchange of gold for paper money under arcane conditions. This period witnessed instability in the value

[8] *Source*: Historical statistics of the United States, Series E 52-63 and E 23-3. Available at https://fred.stlouisfed.org

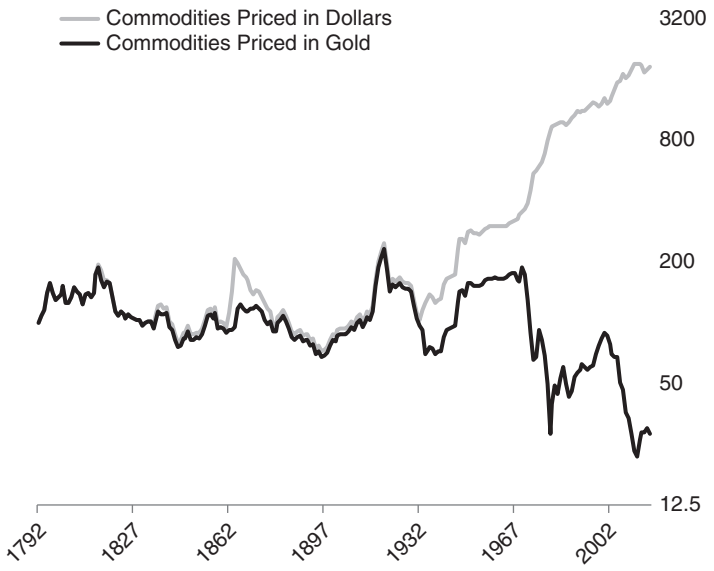

Figure 9 Price of commodities in gold and in U.S. dollars, in log scale, 1792–2016.

of both government money and gold along with the policy changes. For a comparison between gold and government money, it is more useful to look at the period from 1971 to the modern day, where free-floating national currencies have traded in markets with central banks tasked with guaranteeing their purchasing power. (See Figure 10.[9])

Even the best-performing and most stable government forms of 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 currencies. When comparing prices of goods and services to the value of government money and gold, we find a significant rise in their prices as expressed in government money, but relative stability in their prices in gold. The price of a barrel of oil, for instance, which is one of the key commodities of modern industrial society, has been relatively

[9] *Source*: U.S. Federal Reserve statistics. Available at https://fred.stlouisfed.org. Gold price data from World Gold Council, www.gold.org

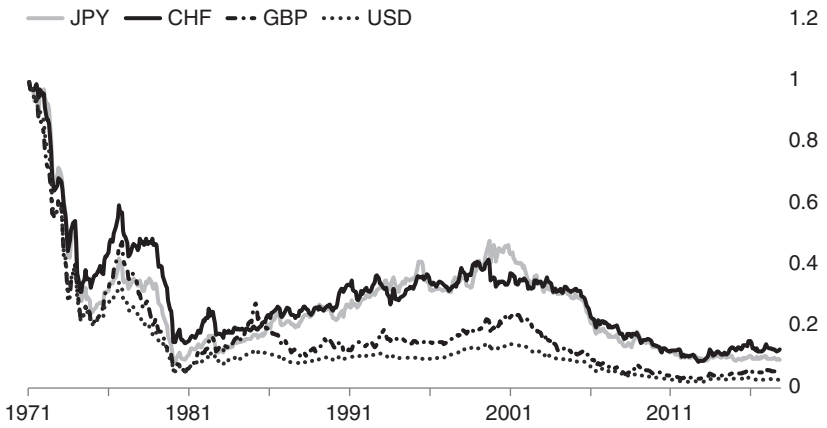

Figure 10 Major currencies priced in gold, 1971–2017.

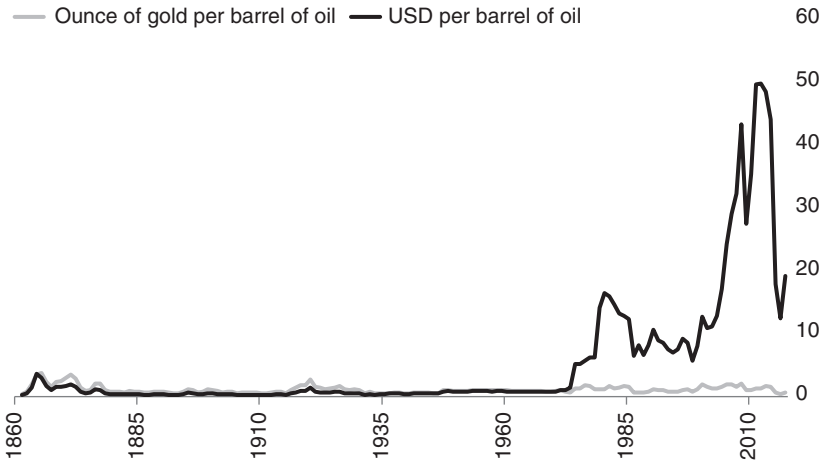

Figure 11 Oil priced in U.S. dollars and ounces of gold, 1861–2017, as multiple of price in 1971.

constant in terms of gold since 1971, while increasing by several orders of magnitude in terms of government money. (See Figure 11.[10])

Hard money, whose supply cannot be expanded easily, will likely be more stable in value than easy money because its supply is largely

[10] *Source*: BP statistical review & World Gold Council.

inelastic while societal demand for money varies little over time as time preference varies. Easy money, on the other hand, because of the ability of its producers to vary its quantity drastically, will engender widely fluctuating demand from holders as the quantity varies and its reliability as a store of value falls and rises.

Relative stability of value is not just important to preserve the purchasing power of holders' savings, it is arguably more important for preserving the integrity of the monetary unit as a unit of account. When money is predictably stable in value due to the small variation in supply and demand, it can act as a reliable signal for changes in prices of other goods and services, as was the case with gold.

In the case of government money, on the other hand, the money supply increases through the expansion of the supply by the central bank and commercial banks, and contracts through deflationary recessions and bankruptcies, while the demand for money can vary even more unpredictably depending on people's expectations of the value of the money and the policies of the central bank. This highly volatile combination results in government money being unpredictable in value over the long term. Central banks' mission of ensuring price stability has them constantly managing the supply of money through their various tools to ensure price stability, making many major currencies appear less volatile in the short run compared to gold. But in the long run, the constant increase in the supply of government money compared to gold's steady and slow increase makes gold's value more predictable.

Sound money, chosen on a free market precisely for its likelihood to hold value over time, will naturally have a better stability than unsound money whose use is enforced through government coercion. Had government money been a superior unit of account and store of value, it would not need government legal tender laws to enforce it, nor would governments worldwide have had to confiscate large quantities of gold and continue to hold them in their central bank reserves. The fact that central banks continue to hold onto their gold, and have even started increasing their reserves, testifies to the confidence they have in their own currencies in the long term, and in the inescapable monetary role of gold as the value of paper currencies continues to plumb new depths.

Saving and Capital Accumulation

One of the key problems caused by a currency whose value is diminishing is that it negatively incentivizes saving for the future. Time preference is universally positive: given the choice between the same good today or in the future, any sane person would prefer to have it today. Only by increasing the return in the future will people consider delaying gratification. Sound money is money that gains in value slightly over time, meaning that holding onto it is likely to offer an increase in purchasing power. Unsound money, being controlled by central banks whose express mission is to keep inflation positive, will offer little incentive for holders to keep it, as they become more likely to spend it or to borrow it.

When it comes to investment, sound money creates an economic environment where any positive rate of return will be favorable to the investor, as the monetary unit is likely to hold onto its value, if not appreciate, thus strengthening the incentive to invest. With unsound money, on the other hand, only returns that are higher than the rate of depreciation of the currency will be positive in real terms, creating incentives for high-return but high-risk investment and spending. Further, as increases in the money supply effectively mean low interest rates, the incentive to save and invest is diminished while the incentive to borrow increases.

The track record of the 46-year experiment with unsound money bears out this conclusion. 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 unimaginable in the past. (See Figure 12.[11])

Only Switzerland, which remained on an official gold standard until 1934, and continued to back its currency with large reserves of gold until the early 1990s, has continued to have a high savings rate, standing as the last bastion of low-time-preference Western civilization with a savings rate in the double digits, as every other Western economy has plummeted into the single digits and even to negative saving rates in some cases. The average savings rate of the seven largest advanced

[11] *Source*: OECD statistics.

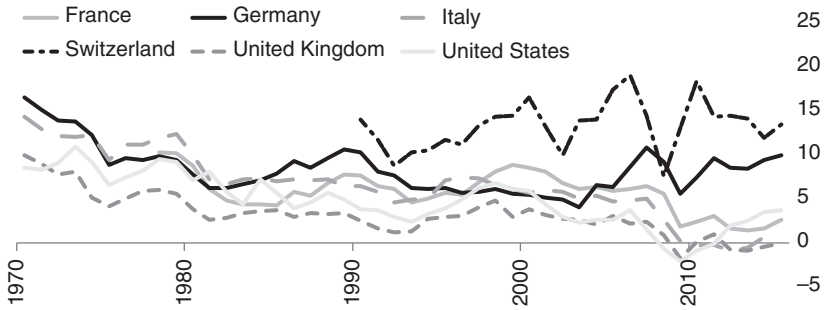

Figure 12 National savings rates in major economies, 1970–2016, %.

economies[12] was 12.66% in 1970, but has dropped to 3.39% in 2015, a fall of almost three-quarters.

While savings rates have plummeted across the western world, indebtedness continues to rise. The average household in the West is indebted by more than 100% of its annual income, while the total debt burden of the various levels of government and households exceeds GDP by multiples, with significant consequences. Such numbers have become normalized as Keynesian economists assure citizens that debt is good for growth and that saving would result in recessions. One of the most mendacious fantasies that pervades Keynesian economic thought is the idea that the national debt "does not matter, since we owe it to ourselves." Only a high-time-preference disciple of Keynes could fail to understand that this "ourselves" is not one homogeneous blob but is differentiated into several generations—namely, the current ones which consume recklessly at the expense of future ones. To make matters worse, this phrase is usually followed by emotional blackmail along the lines of "we would be short-changing ourselves if we didn't borrow to invest for our future."

Many pretend this is a miraculous modern discovery from Keynes's brilliant insight that spending is all that matters, and that by ensuring spending remains high, debts can continue to grow indefinitely and savings can be eliminated. In reality, there is nothing new in this policy, which was employed by the decadent emperors of Rome during its

[12]These are the United States, Japan, Germany, U.K., France, Italy, and Canada.

decline, except that it is being applied with government-issued paper money. Indeed, paper money allows it to be managed a little more smoothly, and less obviously, than the metallic coins of old. But the results are the same.

The twentieth century's binge on conspicuous consumption cannot be understood separately from the destruction of sound money and the outbreak of Keynesian high-time-preference thinking, in vilifying savings and deifying consumption as the key to economic prosperity. The reduced incentive to save is mirrored with an increased incentive to spend, and with interest rates regularly manipulated downwards and banks able to issue more credit than ever, lending stopped being restricted to investment, but has moved on to consumption. Credit cards and consumer loans allow individuals to borrow for the sake of consumption without even the pretense of performing investment in the future. It is 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 for unleashing conspicuous consumption—the exact opposite of capital accumulation. Capitalism is what happens when people drop their time preference, defer immediate gratification, and invest in the future. Debt-fueled mass consumption is as much a normal part of capitalism as asphyxiation is a normal part of respiration.

This also helps explain one of the key Keynesian misunderstandings of economics, which considers that delaying current consumption by saving will put workers out of work and cause economic production to stall. Keynes viewed the level of spending at any point in time as being the most important determinant of the state of the economy because, having studied no economics, he had no understanding of capital theory and how employment does not only have to be in final goods, but can also be in the production of capital goods which will only produce final goods in the future. And having lived off of his family's considerable fortune without having to work real jobs, Keynes had no appreciation of saving or capital accumulation and their essential role in economic growth. Hence, Keynes would observe a recession concurrently with a fall in consumer spending and increase in saving, and assume the causality runs from increased savings to decreased consumption to recession. Had he had the temperament to study capital

theory, he would have understood that the decreased consumption was a natural reaction to the business cycle, which was in turn caused by the expansion of the money supply, as will be discussed in Chapter 6. He would also have understood that the only cause of economic growth in the first place is delayed gratification, saving, and investment, which extend the length of the production cycle and increase the productivity of the methods of production, leading to better standards of living. He would have realized the only reason he was born into a rich family in a rich society was that his ancestors had spent centuries accumulating capital, deferring gratification and investing in the future. But, like the Roman emperors during the decay of the empire, he could never understand 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 saving creates the possibility of capital accumulation and civilizational advance, debt is what can reverse it, through the reduction in capital stocks across generations, reduced productivity, and a decline in living standards. Whether it is housing debt, Social Security obligations, or government debt that will require ever-higher taxes and debt monetization to refinance, the 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 world with less capital than their parents. Rather than witness their savings accumulate and raise the capital stock, this generation has to work to pay off the growing interest on its debt, working harder to fund entitlement programs they will barely get to enjoy while paying higher taxes and barely being able to save for their old age.

This move from sound money to depreciating money has led to several generations of accumulated wealth being squandered on conspicuous consumption within a generation or two, making indebtedness the new method for funding major expenses. Whereas 100 years ago most people would pay for their house, education, or marriage from their own labor or accumulated savings, such a notion seems ridiculous to people today. Even the wealthy will not live within their means and will instead use their wealth to allow them larger loans to finance large purchases. This sort of arrangement can last for a while, but its lasting cannot be mistaken for sustainability, as it is no more than the

systematic consumption of the capital stock of society—the eating of the seed crop.

When money was nationalized, it was placed under the command of politicians who operate over short time-horizons of a few years, trying their best to get reelected. It was only natural that such a process would lead to short-term decision making where politicians abuse the currency to 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."[13] In a society where money is free and sound, individuals have to make decisions with their capital that affect their families in the long run. While it is likely that some would make irresponsible decisions that hurt their offspring, those who wanted to make responsible decisions had the choice to do so. With nationalized money, that became an increasingly harder choice to make, as central governmental control of money supply inevitably destroys incentives to save while increasing the incentive to borrow. No matter how prudent a person, his children will still witness their savings lose value and have to pay taxes to cover for the inflationary largesse of their government.

As the 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, allowing it an increasingly important role to play in more aspects of individuals' lives. The family's ability to finance the individual has been eclipsed by the state's largesse, resulting in a declining incentives for maintaining a family.

In a traditional society, individuals are aware that they will need children to support them in the future, and so will spend their healthy young years starting a family and investing in giving their children the best life possible. But if long-term investment in general is disincentivized, if saving is likely to be counterproductive as money depreciates, this investment becomes less profitable. Further, as politicians sell people the lie that eternal welfare and retirement benefits are possible through the magic of the monetary printing press, the investment in a family becomes less and less valuable. Over time, the incentive to start a family

[13]H. L. Mencken and Malcolm Moos (eds.), *A Carnival of Buncombe* (Baltimore: Johns Hopkins Press, 1956), p. 325.

declines and more and more people end up leading single lives. More marriages are likely to break down as partners are less likely to put in the necessary emotional, moral, and financial investment to make them work, while marriages that do survive will likely produce fewer children. The well-known phenomenon of the modern breakdown of the family cannot be understood without recognizing the role of unsound money allowing the state to appropriate many of the essential roles that the family has played for millennia, and reducing the incentive of all members of a family to invest in long-term familial relations.

Substituting the family with government largesse has arguably been a losing trade for individuals who have partaken in it. Several studies show that life satisfaction depends to a large degree on establishing intimate long-term familial bonds with a partner and children.[14] Many studies also show that rates of depression and psychological diseases are rising over time as the family breaks down, particularly for women.[15] Cases of depression and psychological disorders very frequently have family breakdown as a leading cause.

It is no coincidence that the breakdown of the family has come about through the implementation of the economic teachings of a man who never had any interest in the long term. A son of a rich family that had accumulated significant capital over generations, 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.[16] Whereas Victorian Britain was a low-time-preference society with a strong sense of morality, low interpersonal conflict, and stable families, Keynes was part of a generation that rose against these traditions and viewed them as a repressive institution to be brought down. It is impossible to understand the economics of Keynes without

[14] George Vaillant, *Triumphs of Experience: The Men of the Harvard Grant Study*. (Cambridge, MA: Harvard University Press, 2012).

[15] Betsy Stevenson and Justin Wolfers, "The Paradox of Declining Female Happiness." *American Economic Journal: Economic Policy*, vol. 1, no. 2 (2009): 190–225.

[16] See Michael Holroyd, *Lytton Strachey: The New Biography*, vol. I, p. 80, in which a letter sent by Keynes to his friend Lytton Strachey in the Bloomsbury set advised them to visit Tunis "where bed and boy were not expensive." See also David Felix, *Keynes: A Critical Life*, p. 112, which quotes a letter from Keynes in which he informs a friend, "I'm leaving for Egypt … I just learned that 'bed and boy' is prepared." In another letter, he recommended Strachey go to Tunis and Sicily "if you want to go to where the naked boys dance."

understanding the kind of morality he wanted to see in a society he increasingly believed he could shape according to his will.

Innovations: "Zero to One" versus "One to Many"

The impact of sound money on time preference and future orientation can be seen in more than just the level of savings, but also in the type of projects in which a society invests. Under a sound money regime, similar to what the world had in the late nineteenth century, individuals are far more likely to engage in long-term investments and to have large amounts of capital available to finance the sort of projects that will require a long time to pay off. As a result, some of the most important innovations in human history were born in the golden era at the end of the nineteenth century.

In their seminal work, *The History of Science and Technology*, Bunch and Hellemans compile a list of the 8,583 most important innovations and inventions in the history of science and technology. Physicist Jonathan Huebner[17] analyzed all these events along with the years in which they happened and global population at that year, and measured the rate of occurrence of these events per year per capita since the Dark Ages. Huebner found that while the total number of innovations rose in the twentieth century, the number of innovations per capita peaked in the nineteenth century.

A closer look at the innovations of the pre-1914 world lends support to Huebner's data. It is no exaggeration to say that our modern world was invented in the gold standard years preceding World War I. The twentieth century was the century that refined, improved, optimized, economized, and popularized the inventions of the nineteenth century. The wonders of the twentieth century's improvements make it easy to forget that the actual inventions—the transformative world-changing innovations—almost all came in the golden era.

In his popular book, *From Zero to One*, Peter Thiel discusses the impact of the visionaries who create a new world by producing the first

[17]Jonathan Huebner, "A Possible Declining Trend for Worldwide Innovation," *Technological Forecasting and Social Change*, vol. 72 (2005): 980–986.

successful example of a new technology. The move from having "zero to one" successful example of a technology, as he terms it, is the hardest and most significant step in an invention, whereas the move from "one to many" is a matter of scaling, marketing, and optimization. Those of us who are enamored with the concept of progress might find it hard to swallow the fact that the world of sound money pre-1914 was the world of zero to one, whereas the post-1914 world of government-produced money is the world of moving from one to many. There is nothing wrong with the move from one to many, but it certainly gives us plenty of food for thought to consider why we do not have many more zero-to-one transformations under our modern monetary system.

The majority of the technology we use in our modern life was invented in the nineteenth century, under the gold standard, financed with the ever-growing stock of capital accumulated by savers storing their wealth in a sound money and store of value which did not depreciate quickly. A summary of some of the most important innovations of the period is provided here:

- Hot and cold running water, indoor toilets, plumbing, central heating:

  These inventions, taken for granted today by anyone living in a civilized society, are the difference between life and death for most of us. They have been the main factor in the elimination of most infectious diseases across the globe, and allowed for the growth of urban areas without the ever-present scourge of diseases.
- Electricity, internal combustion engine, mass production:

  Our modern industrial society was built around the growth in utilization of hydrocarbon energy, without which none of the trappings of modern civilization would be possible. These foundational technologies of energy and industry were invented in the nineteenth century.
- Automobile, airplane, city subway, electric elevator:

  We have *la belle époque* to thank for our cities' streets not being littered with horse manure, and for our ability to travel around the world. The automobile was invented by Karl Benz in 1885, the airplane by the Wright brothers in 1906, the subway by Charles Pearson in 1843, and the electric elevator by Elisha Otis in 1852.

- Heart surgery; organ transplant; appendectomy; baby incubator; radiation therapy; anesthetics, aspirin, blood types and blood transfusions, vitamins, electrocardiograph, stethoscope:

  Surgery and modern medicine owe their most significant advances to *la belle époque* as well. The introduction of modern sanitation and reliable hydrocarbon energy allowed doctors to transform the way they cared for their patients after centuries of largely counterproductive measures.
- Petroleum-derived chemicals, stainless steel, nitrogen-based fertilizers:

  The industrial substances and materials which make our modern life possible all derive from the transformative innovations of *la belle époque*, which allowed for mass industrialization, as well as mass agriculture. Plastics, and everything that comes from them, are a product of the utilization of petroleum-derived chemicals.
- Telephone, wireless telegraphy, voice recording, color photography, movies:

  While we like to think of our modern era as being the era of mass telecommunication, in reality, most of what we have achieved in the twentieth century was to improve on the innovations of the nineteenth. The first computer was the Babbage computer, designed in 1833 by Charles Babbage, but completed by his son Henry in 1888. It might be an exaggeration to say that the Internet and all it contains are bells and whistles added onto the invention of the telegraph in 1843, but it does contain a kernel of truth. It was the telegraph which fundamentally transformed human society by allowing for communication without the need for the physical transport of letters or messengers. That was telecommunication's zero-to-one moment, and everything that followed, for all its wonders, has been a one-to-many improvement.

Artistic Flourishing

The contributions of sound money to human flourishing are not restricted to scientific and technological advance; they can also be vividly seen in the art world. It is no coincidence that Florentine and

Venetian artists were the leaders of the Renaissance, as these were the two cities which led Europe in the adoption of sound money. The Baroque, Neoclassical, Romantic, Realistic, and post-Impressionistic schools were all financed by wealthy patrons holding sound money, with a very low time preference and the patience to wait for years, or even decades, for the completion of masterpieces meant to survive for centuries. The astonishing domes of Europe's churches, built and decorated over decades of inspired meticulous work by incomparable architects and artists like Filippo Brunelleschi and Michelangelo, were all financed with sound money by patrons with very low time preference. The only way to impress these patrons was to build artwork that would last long enough to immortalize their names as the owners of great collections and patrons of great artists. This is why Florence's Medicis are perhaps better remembered for their patronage of the arts than for their innovations in banking and finance, though the latter may be far more consequential.

Similarly, the musical works of Bach, Mozart, Beethoven, and the composers of the Renaissance, Classical, and Romantic eras put to shame today's animalistic noises recorded in batches of a few minutes, churned out by the ton by studios profiting from selling to man the titillation of his basest instincts. Whereas the music of the golden era spoke to man's soul and awakened him to think of higher callings than the mundane grind of daily life, today's musical noises speak to man's most base animalistic instincts, distracting him from the realities of life by inviting him to indulge in immediate sensory pleasures with no concern for long-term consequences or anything more profound. It was hard money that financed Bach's *Brandenburg Concertos* while easy money financed Miley Cyrus's twerks.

In times of sound money and low time preference, artists worked on perfecting their craft so they could produce valuable works in the long run. They spent years learning the intricate details and techniques of their work, perfecting it and excelling in developing it beyond the capabilities of others, to the astonishment of their patrons and the general public. Nobody stood a chance of being called an artist without years of hard work on developing their craft. Artists did not condescendingly lecture the public on what art is and why their lazy productions that took a day to make are profound. Bach never claimed to be a genius or spoke

at length about how his music was better than that of others; he instead spent his life perfecting his craft. Michelangelo spent four years hanging from the ceiling of the Sistine Chapel working for most of the day with little food in order to paint his masterpiece. He even wrote a poem to describe the ordeal:[18]

> I've grown a goitre by dwelling in this den—
> As cats from stagnant streams in Lombardy,
> Or in what other land they hap to be—
> Which drives the belly close beneath the chin:
> My beard turns up to heaven; my nape falls in,
> Fixed on my spine: my breast-bone visibly
> Grows like a harp: a rich embroidery
> Bedews my face from brush-drops thick and thin.
> My loins into my paunch like levers grind:
> My buttock like a crupper bears my weight;
> My feet unguided wander to and fro;
> In front my skin grows loose and long; behind,
> By bending it becomes more taut and strait;
> Crosswise I strain me like a Syrian bow:
> Whence false and quaint, I know,
> Must be the fruit of squinting brain and eye;
> For ill can aim the gun that bends awry.
> Come then, Giovanni, try
> To succour my dead pictures and my fame;
> Since foul I fare and painting is my shame.

Only with such meticulous and dedicated effort over many decades did these geniuses succeed in producing these masterpieces, immortalizing their names as the masters of their craft. In the era of unsound money, no artist has the low time preference to work as hard or as long as Michelangelo or Bach to learn their craft properly or spend any significant amount of time perfecting it. A stroll through a modern art gallery shows artistic works whose production requires no more effort or talent than can be mustered by a bored 6-year-old. Modern artists have replaced

[18]John Addington Symonds, *The Sonnets of Michael Angelo Buonarroti* (London: Smith Elder & Co., 1904).

craft and long hours of practice with pretentiousness, shock value, indignation, 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. To the extent that anything good can be said about modern "art," it is that it is clever, in the manner of a prank or practical joke. There is nothing beautiful or admirable about the output or the process of most modern art, because it was produced in a matter of hours by lazy talentless hacks who never bothered to practice their craft. Only cheap pretentiousness, obscenity, and shock value attract attention to the naked emperor of modern art, and only long pretentious diatribes shaming others for not understanding the work give it value.

As government money has replaced sound money, patrons with low time preference and refined tastes have been replaced by government bureaucrats with political agendas as crude as their artistic taste. Naturally, then, neither beauty nor longevity matters anymore, replaced with political prattling and the ability to impress bureaucrats who control the major funding sources to the large galleries and museums, which have become a government-protected monopoly on artistic taste and standards for artistic education. Free competition between artists and donors is now replaced with central planning by unaccountable bureaucrats, with predictably disastrous results. In free markets, the winners are always the ones who provide the goods deemed best by the public. When government is in charge of deciding winners and losers, the sort of people who have nothing better to do with their life than work as government bureaucrats are the arbiters of taste and beauty. Instead of art's success being determined by the people who have succeeded in attaining wealth through several generations of intelligence and low time preference, it is instead determined by the people with the opportunism to rise in the political and bureaucratic system best. A passing familiarity with this kind of people is enough to explain to anyone how we can end up with the monstrosities of today's art.

In their fiat-fueled ever-growing realm of control, almost all modern governments dedicate budgets to finance art and artists in various media. But as time has gone by, bizarre and barely believable stories have emerged about covert government meddling in arts for political agendas. While the Soviets funded and directed communist "art" to achieve