

Chapter 1

Overview of the History of Money



Money is the solution and all doors that are closed to the man of lesser wealth open to him whom Plutus favors. The invention of this means, which does not have (or at least should not have) any use other than that of serving merely as a means for the exchange of human beings' industry, and with it, however, everything that is also physically good among them, has, especially after it was represented by metal, brought forth a mania for possession which finally, even without enjoyment in the mere possession, and even with the renunciation (of the miser) of making any use of it, contains a power that people believe satisfactorily replaces the lack of every other power. This passion is, if not always morally reprehensible, completely banal, is cultivated merely mechanically, and is attached especially to old people (as a substitute for their natural incapacity). On account of the great influence of this universal means of exchange it has also secured the name of a *faculty* purely and simply, and it is a passion such that, once it has set in, no modification is possible. And if the first of the three passions makes one *hated*, the second makes one *feared*, and the third makes one *despised*. Kant (1798) *Anthropology from a Pragmatic Point of View*, English translation version, Cambridge University Press, 2006, p. 174.

1.1 Introduction

The purpose of this chapter is to identify remaining research interests in money in the age of digitalization and put my past research topics in perspective. I have no intention to conduct a comprehensive review of the history of money,¹ nor to search for the origin of money.

¹ Those who want to know the history of money in general, read Angell (1930), Davis (2002), Ingham (2004), Lannoye (2015), Vilar (1969), Desan (2014), Martin (2014), Orrell (2020), and Sehgal (2015), among others. Those who want to learn about ancient money, read Bitros et al. (2021), Harris (2008), Reden (2010) and Seaford (2004). Those who want to learn the origin of money, read Grierson (1977) and Karimzadi (2013). Those who want to learn the current state and future of money, read Allen et al. (2019), Birch (2014, 2019), Coggan (2012), Greco, Jr. (2001), Lietaer and Dunne (2013), Vigna and Casey (2015), among others.

In my research, I started the choice of optimal currency denomination in 1996. Until then, I had no idea how the currency denomination was determined on what conditions. I was inspired by Telser (1995). I thought about the shortage of small change issues in developing countries in general and in Iraq in particular. It is easy to imagine how difficult it is to price goods and services when a proper set of currency denominations is not available. These research results were eventually realized in the new issuance of the 2000 yen note in the year 2000. I was very pleased to see my first research contribution to the Japanese economy.

Because of the tradition of Marxist economics education in Japan, many Japanese economists once learned the commodity theory of money. Many of them contributed in the literature. But I felt somewhat uncomfortable with this theory and found the credit theory of money more convincing. The recent anthropological discoveries seem to support the credit theory of money.

I then investigated Kant's view of money. Kant was the most important philosopher since Aristotle. Aristotle introduced the commodity theory of money and Thomas Aquinas, Adam Smith, Karl Marx, and Carl Menger, among others, follow this theory. I was curious how Kant thought about the origin and function of money. I had not read Kant's view of money before, so I decided to introduce Kant's writing in this chapter.

John Law's life is very interesting and dramatic as the plays and novels based on his life were actually written by many writers. Law was known to introduce fiat money for the first time on a nation-wide level; nowadays fiat money is common around the world.

My research on money shifted to consider the role of electronic money and its substitution with small denomination coins in the 2000s. Then Bitcoin emerged in the market in 2009. I started to investigate the nature and possibility of cryptocurrency.

In case of the pure exchange economy, it was well known that to achieve a general equilibrium, money has no role. Meanwhile, Samuelson's overlapping generations model found the credit theory of money reasonable and efficient to allocate scarce resources among society over time.

I hope my review of the history of money would help in understanding my research following this chapter.

1.1.1 Two Theories of Money

Broadly speaking, there are two theories of money: the commodity theory of money and the credit theory of money. Imagine there is no money, people have to barter goods with each other and barter only works when there is a *double coincidence of wants*. But such coincidences are likely to be uncommon, as a barter economy seems inefficient. It is said that at some point, people realized that they could trade more easily if they used some intermediate goods or money. According to Orrell (2020), "[A]nthropologists can produce numerous examples of so-called primitive currencies that were based on commodities. Cacao beans in ancient Mexico; cowrie

shells in ancient China; tools, iron rings, or brass rods in parts of Africa; human skulls in Sumatra; or woodpecker scalps among the Karok people of the California interior. Feathers in the Solomon Islands. Dog teeth in Papua New Guinea, and whale teeth in Fiji. Strings of wampum beads in the American colonies. Extremely large and heavy stone discs in the Pacific island of Yap” (p. 16).

The commodity theory of money can be traced back to Aristotle (*Politics*, 1255b–1256b). He argues the reason for the birth of metal money as follows: “The reason for this institution of a currency was that all the naturally necessary commodities were not easily portable; and men therefore agreed, for the purpose of their exchanges, to give and receive some commodity (i.e., some form of more or less precious metal) which itself belonged to the category of useful things and possessed the advantage of being easily handled for the purpose of getting the necessities of life. Such commodities were iron, silver, and other similar metals. At first their value was simply determined by their size and weight; but finally a stamp was imposed on the metal which, serving as a definite indication of the quantity, would save men the trouble of determining the value on each occasion” (Aristotle, *Politics*, Vol. 1, Chapter 9, 1257a § 8, p. 24).

Smith (1776) follows Aristotle, and he discusses the origin and use of money as follows: “When the division of labour has been once thoroughly established, it is but a very small part of a man’s wants which the produce of his own labour can supply. He supplies the far greater part of them by exchanging that surplus part of the produce of his own labour, which is over and above his own consumption, for such parts of the produce of other men’s labour as he has occasion for. Every man thus lives by exchanging, or becomes in some measure a merchant, and the society itself, grows to be what is properly a commercial society.” (Chap. 4, p. 22).

Smith goes on discussing, “In all countries, however, men seem at last to have been determined by irresistible reasons to give the preference, for this employment, to metals above every other commodity. Metals can not only be kept with as little loss as any other commodity, scarce anything being less perishable than they are, but they can likewise, without any loss, be divided into any number of parts, as by fusion those parts can easily be reunited again; a quality which no other equally durable commodities possess, and which more than any other quality renders them fit to be the instruments of commerce and circulation.” (Chap. 4, pp. 23–24).

Neither Aristotle nor Smith discussed in detail how normal commodities were converted into precious metals under whose initiatives. According to the anthropological evidences of commodity money such as cacao beans, cowrie shells, tools, iron rings and brass rods—these were not used the same way as money. They were used for more ceremonial purposes than means of daily exchange. In addition, as many economists have described, the barter exchanges of, for example, textiles and coffee, coffee and tea, tea and chicken, chicken and fish, and fish and textiles. What we need in such cases is the amount of money suitable for daily shopping, say, 10–50 dollar notes, while the values of metal money minted in ancient times were worth

one month's living expenses or more—5,000–10,000 dollars. There was a big gap between money we needed for shopping and metal money we had in the past.²

To fill this gap, an alternative theory of money was presented by Innes (1914) and Macleod (1882), among others. That was the credit theory of money. In this theory, money is a social construction in general and a credit relationship in particular. In other words, it is a promise from someone to grant (or repay) a favor (product or service) to the holder of the token. In order to function as money, two further features are crucial; (1) the promise is sufficiently credible, that is, the issuer is “creditworthy”, and (2) the credit is transferable, that is, also others will accept it as payment for trade.³ Historically these promises were made by the ruler/king/state for military or civil services or goods and services provided by the merchants.

According to Orrell (2020, pp. 18), well before metallic money was introduced, the Sumerians invented writing, arithmetic, the 24-h day, wheeled vehicles, beer, and the whole concept of urban living. The cities were ruled by temple bureaucrats, who allocated provisions and tracked commercial transactions on clay tablets in what known to historians and museum visitors as cuneiform writing.

It is important to note that temple accountants indicated weights using a system of units that, like their number system, was based on multiples of 60 and that around 3000 BC they began to use a shekel of silver, which is equivalent to around 8.3 g, or about what is in a solid silver ring, as a unit of currency and that the price of everything else was set by the state in terms of these shekels.⁴ The Laws of Eshnunna, named after a city near what is now Baghdad, specified prices for various commodities, where volume was measured in units of *sila* that corresponded to about a litre. It was recorded that a month's basic labour was worth 1 shekel of silver,⁵ While price lists were set in shekels, this did not actually mean that people bought things in shekels of silver. Instead, the shekels were better seen as a unit of accounting in what amounted to a credit system.⁶ Loans attracted interest as a rate known as the *máš*, which meant

² Introduction of small-denomination metal money started in medieval times where and when commercial activities such as regular market trading took place. Somewhat related issues are discussed in Chaps. 2 and 3. Commodity money such as cowrie shells may be used as a substitute for small change (denomination).

³ According to the Stanford Encyclopedia of Philosophy, Philosophy of Money and Finance, Nov. 14, 2018 version.

⁴ It is known that the actual silver was located in closely guarded vaults in the temple, the ancient time's equivalent of Fort Knox.

⁵ This is a clear evidence that the value of money is set equal to a month's labour, which is the basis of labour theory of value. Kant took this view. We will come back to this later.

⁶ Orrell (2020, p. 20) states that “for example, a farmer's use of wool or beer could be paid for at harvest time by delivery of the corresponding quantity of barley, as calculated using official prices. Larger debts were placed inside clay envelopes and marked with the seal of the borrower. The creditor would keep the envelope, and break it open when the debt was repaid, thus cancelling the debt. In some cases, the tablet promised to repay whoever held the envelope, which meant that the right to collect debt could be sold to another person. As we will see, many forms of money start off as debts in exactly this way”. This story exactly describes the credit theory of money.

“baby calf”, money procreated just like farm animals.⁷ For commercial loans the basic rate was set at 1/60 per month (i.e., 1.67%), or 20% a year, which is based on the number system of 60.⁸

As we have seen in Babylonia (Mesopotamia), the Sumerians had developed a functioning financial system that involved money, debt, taxes, legal penalties and so on; discovered many facts about mathematics, astronomy, chemistry, physics, and biology; defined measurements (length, weight, volume, time, a calendar); a unit of accounting; lists of relative prices of commodities, services, and penalties. We need to have a good understanding of money in Babylonia as a financial instrument or a device of credit and accounting.

I will come back to the issues related to the Iraqi monetary system in Chap. 3. It may not be coincidence that I have been fascinated with the monetary and economic systems in Babylonia (Mesopotamia) in ancient time and Iraq and Iran in modern times.

The first known coins date back to the seventh century BC in the kingdom of Lydia (now in Turkey). The coins were oval pieces of a gold–silver alloy called electrum. It could be accurately weighed and measured, and was certified with a stamp, meaning that it would always be accepted within a certain region. One starter (a translation of “shekel”) weighed about 14 g and would be equal to, as noted above, one month’s basic salary. As the Lydians were active traders, the idea of coinage spread to the Greek cities and surrounding islands. By 600 BC, most Greek city-states issued their own coins. Orrell (2020, p. 22) pointed out that “this hints at the real purpose of coin money, which is that it had less to do with the needs of everyday life, than with the needs of the state. . . . By far the largest expense for states at the time was paying and supplying the army, and coins were a neat way of addressing a number of logistical issues”. It seems evident that the state created coin money to finance the wars and that the state required payment of taxes in coins, so that the state could maintain the army.

Another example of credit theory of money came from the Pacific Island of Yap. William Henry Furness III, a young anthropologist from the USA, made a two-month visit to Yap and published a broad survey of its physical and social make-up (Furness, 1910). In his book, he mentioned that Yap had a highly developed system of money. It was impossible for Furness not to notice it the moment that he set foot on the island, because its coinage was extremely unusual. It consisted of *fei*—“large, solid, thick stone wheels ranging in diameter from a foot to twelve feet, having in the centre a hole varying in size with diameter of the stone, wherein a pole may be inserted sufficiently large and strong to bear the weight and facilitate transportation” (p. 93). Furness further wrote that “the noteworthy feature of this stone currency is that it is not necessary for its owner to reduce it to possession. After concluding a bargain

⁷ In Babylonia, interest was taken for granted, given the economy was growing. See Sect. 1.5 of this chapter for and against interest.

⁸ This is based on the solar calendar, in which the earth goes around the sun. If this orbit is an exact circle, 360 degrees are needed to return to the same position; 60 is equivalent to two months’ movement of the earth.

which involves the price of a *fei* too large to be conveniently moved, its new owner is quite content to accept the bare acknowledgement of ownership and without so much as a mark to indicate the exchange, the coin remains undisturbed on the former owner's premises" (p. 96),⁹

John Maynard Keynes was fascinated with this discovery and wrote in a book review, "It has brought us into contact with a people whose ideas on currency are probably more truly philosophical than those of any other country. Modern practice in regard to gold reserves has a good deal to learn from the more logical practice of the island of Yap" (Keynes, 1915).

Martin (2014) eloquently argues that "The story of Yap stripped away a central, misleading preconception about the nature of money that had bedevilled economists for centuries: that what was essential was the currency, the commodity coinage, which functioned as a 'medium of exchange'. It showed that in a primitive economy like Yap, just as in today's system, currency is ephemeral and cosmetic: it is the underlying mechanism of credit accounts and clearing that is the essence of money. ... At the centre of this alternative view of money is credit. Money is not a commodity medium of exchange, but a social technology composed of three fundamental elements. The first is an abstract unit of value in which money is denominated. The second is a system of accounts, which keeps track of the individuals' or the institutions' credit or debt balances as they engage in trade with one another. The third is the possibility that the original creditor in a relationship can transfer their debtor's obligation to a third party in settlement of some unrelated debt" (p. 26). The third element is enforced by Macleod's (1882) statement that "these simple considerations at once shew the fundamental nature of a currency. It is quite clear that its primary use is to measure and record debts, and to facilitate their transfer from one person to another; and whatever means be adopted for this purpose, whether it be gold, silver, paper, or anything else, is a currency. We may therefore lay down our fundamental conception that currency and transferable debt are convertible terms; whatever material the currency may consist of, it represents transferable debt, and nothing else" (p. 188).

As we have seen, the value of ancient metal money was about equal to one month's labour. What does it mean? It is almost self-explanatory that the ruler (e.g., king) issued metal money in exchange of one month's labour or military service. The ruler also asked merchants and citizens to accept this metal money in exchange for goods and services that soldiers or servants demanded.

⁹ The reason *fei* was not physically exchanged might be that *fei* itself served as a public ledger so that everyone in the island knew and monitored who owned individual *fei* at any moment. It is like the blockchain in the Bitcoin system.

1.2 Kant's View on Money

When we think about money, we rarely encounter Immanuel Kant's view on money. If we face the ethical problem or theory of justice, then ethical and political writings of Kant are indispensable for all researchers in the field, as repeatedly quoted by eminent thinkers in our time such as Berlin, Rawls, and Sen. We are influenced and instructed by Kant to a large extent.

I had a chance to read Kant's writing on money. I was impressed by his writing, so I would like to introduce it here.

Kant wrote about money in two books. One comes is *Anthropology from a Pragmatic Point of View*, which I quote at the beginning of this chapter. The other is *The Metaphysics of Morals*, Part I (I), *Private Right*. We will look at the latter materials closely.

Kant saw various aspects of money:

- (1) Money is a thing that can be used only by being *alienated*. Two implications are derived: first, that the alienation of money in exchange is intended not as a gift but for reciprocal acquisition (by a *pactum onerosum*); and second, that money represents all goods, since it is conceived as a universally accepted mere means of commerce (within a nation), having no value in itself, as opposed to things that are *goods* (i.e., that have value in themselves and are related to the particular needs of one or another in the nation) (Kant, 2017, p. 75).
- (2) A preliminary real definition of money can be given: it is the universal means by which human beings exchange their industriousness with one another. Thus a nation's wealth, insofar as it is acquired by means of money, is really only the sum of the industry with which human beings pay one another and which is represented by the money in circulation within it (Kant, 2017, p. 76),
- (3) How is it possible that what were at first only goods finally became money? This would happen if a powerful, opulent ruler¹⁰ who at first used a material for the adornment and splendour of his attendants (his court) came to levy taxes on his subjects in this material (as goods) (e.g., gold, silver, copper, or a kind of beautiful seashell, cowries; or as in the Congo, a kind of matting called *makutes*; in Senegal, iron ingots; or on the Coast of Guinea, even black slaves), and in turn paid with this same material, those his demand moved to industry in procuring it, in accordance with exchange regulations with them and among them (on a market or exchange). In this way only (so it seems to me) could a certain merchandise have become a lawful means of exchange of the industry of subjects with one another, and thereby also become the wealth of the nation, that is, *money*. (Kant, 2017, pp. 76–77).

¹⁰ Kant's view of the creation of money by the ruler was an ancestor of Knapp (1924) *The State Theory of Money*. This is also known as *chartalism* in which the value of currency is based on the power of the issuing government authority as opposed to *metallism* in which the value of currency depends on its intrinsic value or backing anchor.

- (4) The intellectual concept under which the empirical concept of money falls is therefore the concept of a thing which, in the circulation of possessions (*permutation publica*) determines the price of all other things (goods), among which even the sciences belong, insofar as they would not otherwise be taught to others. The amount of money in a nation therefore constitutes its wealth (*opulentia*). For the price (*pretium*) of a thing is the judgment of the public about its value (*valor*) in proportion to that which serves as the universal means to represent reciprocal exchange of industry (its circulation) (Kant, 2017, p. 77).
- (5) Money is therefore, according to Adam Smith, that material thing the alienation of which is the means and at the same time the measure of the industry by which human beings and nations carry on trade with one another. (Kant, 2017, p. 77).

This book, *the Metaphysics of Morals*, written in 1797, is about the law, and this section, (I) private right, handles civil law in a broad sense. As we read what Kant wrote on money, he did not accept the commodity theory of money. He took the labour theory of value from Adam Smith. But he also admitted money as a transferable item (credit or debt) and money was given in exchange for labour. This is closer to the credit theory of money. He was clear that money has no value in itself but can buy all goods. Because of the labour theory of value, the relative prices of goods and services and the relative wages of production and services could be determined.¹¹ He also insisted that nation's wealth could be represented by the money in circulation, which was interpreted as an early form of macroeconomics. He briefly mentioned that where there is a great deal of trade, neither gold nor copper is regarded as strictly money but only as merchandise, since there is too little gold and too much copper for them to be easily put into circulation and yet available in sufficiently small parts, as is necessary for the exchange of merchandise, or a mass of it, in the smallest purchase (p. 77). This story was commonly known as shortage of small changes in medieval times.

Kant was not an economist. But his understanding of economics in general and money in particular was quite clear and up to date or even exceeded his contemporary economists.

1.3 Fiat Money

Kant rejected paper money or, more precisely, fiat money, stating that "bank notes and promissory notes cannot be regarded as money, although they can substitute for it temporarily; for they cost almost no industry to produce and their value is based solely on the opinion that they will continue as before to be convertible into hard cash; but if it is eventually discovered that there is not enough hard cash for which

¹¹ Kant did not make a distinction between the goods market and the labour market. He seemed to understand that labour value can determine all relative prices both in goods and labour markets.

they can be readily and securely exchanged, this opinion suddenly collapses and makes failure of payment inevitable” (Kant, 2017, p. 76).¹²

According to Starr (2012), fiat money is defined as (i) inconvertible token currency promulgated by the state; and (ii) inconvertible token currency (not necessarily enforced by the government). The first definition is the focus of the chartalist school; the role of government is explicit. The second definition enters into many twentieth and twenty-first century formal models without explicit treatment of government (op. cit., p. 6).

Fiat money is nowadays a common form of money, especially after August 15, 1971, when Richard Nixon, the 37th President of United States of America, announced the halting of the U.S. dollar’s convertibility to gold. The delinking of money with gold effectively turned the major currencies, including the U.S. dollar, into fiat money. Foreign exchange rate became floating since February 14, 1973, as a consequence.

Historically, fiat money had been issued from time to time—for example, in 1690, the Massachusetts colonial government issued fiat money. But as far as the nationwide monetary experience was concerned, the French government’s introduction of fiat money on December 24, 1718, initiated by a Scottish policy projector, John Law, is worth discussing.

Many popular books on money quote the episode of John Law—for example, Martin (2014), Coggan (2012), and Orrell (2020). Here, I would like to summarize that episode and the lessons from it.

John Law¹³ was 34 years old in 1705. He studied commerce and policy projects (recommendations) for the governments in London. He published his treatise on money, *Money and Trade Considered, with a Proposal for Supplying the Nation with Money* in 1705. This book is profound and modern in the sense that Law considered (1) the nature of money, (2) the relationship between money and trade, and (3) the policy issue of how to produce a new monetary structure capable of expanding the money supply. Truly, this was an early macroeconomic structural model in which money and the real economic activities were highly integrated.¹⁴ Law believed that monetary expansion would generate increases in trade, employment and output. His macroeconomic system can be summarized as follows,¹⁵ “(1) Trade depends on money; (2) There is some proportional relationship between the amount of money in

¹² This statement is somewhat surprising because Kant did not adopt the commodity theory, or *metallism*, but this is understandable because labour costs in paper notes or promissory notes are regarded as almost zero. Kant did not mention John Law and his episode in France in 1716–1720.

¹³ Comprehensive and good biographies of John Law can be found in Murphy (1997) and Buchan (2018). See also Murphy (2009) for macroeconomic interpretations of John Law.

¹⁴ Murphy (1997, p. 88) indicates that Law may have been influenced by Sir William Petty, who produced a remarkable embryonic macroeconomic framework in *Verbum Sapienti*, written in 1664. There, Petty presented the equality of national income and national expenditure and the distinction between the stock of wealth and the flow of income derived from such wealth.

¹⁵ It is often said that Adam Smith was the founding father of modern economics because of his *Wealth of Nations* (1776). But reading Law (1705), changes my view of how economics was created and by whom. I am quite sure that no swindler (John Law was so described after the Mississippi bubble) could write such a lucid book on money. John Law was equipped with a macroeconomic

circulation and the number of people employed; (3) Money is required because it is used to pay the wages of the workforce; (4) Credit is not practicable unless the credit can be used to purchase goods and services demanded by the employed workers, and credit used in such a way becomes money; (5) A greater quantity of money employs more people than a lesser quantity.” Murphy (1997, p. 89).

With this policy project, John Law appeared in France in 1715 when Louis XIV died after 72 years on the throne and his nephew, Philip, Duke of Orleans, was confirmed as Regent. Through the Duke of Orleans, John Law had a chance to implement his project.

The first part of his project was designed to address France’s lack of a money supply sufficient for the needs of its economic potential. John Law persuaded the Regent to allow him to establish a General Bank, which issued bank notes for the first time in France. This bank adopted a convertibility of its notes with gold and silver. Law made the General Bank’s notes able to be used to settle foreign trade, and the Regent announced that taxes would be payable using its notes. The Bank was successful and its notes began to circulate widely and to stimulate trade (Martin, 2014, p. 173). In December 1718, the General Bank was nationalized and named the Royal Bank, with additional authority. It was announced that the bank notes were delinked with its holdings of gold and silver coins. This was John Law’s introduction of fiat money in France (*ibid.*, p. 174).

The second part of his project was to improve the parasitic system of public finance and the unsustainable level of the public debt. In 1717, Law convinced the Regent to allow him to form a joint stock company, the Company of the West, and to award it the rights to develop French North America, where the vast and virgin territories were expected to yield huge business profits for the Company. Holders of sovereign bonds were invited to swap their debt claims for equity shares of the Company of the West. The bond holders were eager to exchange bonds for equity shares (*ibid.*, pp. 174–175).

In August 1719, Law launched the last part of his project. The Company acquired the rights to collect all indirect taxes in France. Its revenues were collected from the entire French economy. At the same time, it announced its intention to buy up the remaining part of the sovereign debt. To absorb these transactions, the Company issued huge tranches of new equity. The Company’s share price rose from 500 livres in May 1719 to over 10,000 livres in December 1719. This was known as the Mississippi bubble. Law had achieved a comprehensive swap of government debt for government equity. His economic system worked unprecedentedly well. The Royal Bank’s notes became the legal tender, and gold and silver lost their status as the legal tender. The supremacy of bank money and the fiat standard was complete (*ibid.*, p.175). Here, John Law’s mission was complete. On January 5, 1720, John Law was appointed as Controller-General of the Finances of France.

As is usually the case with a bubble economy, Law’s system did not work long. At the end of May 1720, Law’s system disintegrated and Law was arrested. On

framework, quite similar to that of Keynes (1936) in *The General Theory of Employment, Interest and Money*.

June 1, gold and silver were restored as the legal tender. Many other financial and social arrangements reverted to old system that had been in effect before John Law. On December 1720, Law managed to escape from France in fear for his life. He eventually died on March 21, 1729, in Venice, Italy, at the age 57, one month before his 58th birthday.

In retrospect, John Law conducted a remarkable social experiment in the most important European kingdom, France. He believed that metal money did not help the economy, and that money and the real economy (production and employment) were tightly linked (non-neutrality of money). His macroeconomic framework was quite similar to what we use nowadays. The other policy tools such as debt-equity swap and M&A strategy that Law used were extraordinarily unique and modern. He was indeed the strategist of all time, projecting into the future.

As to fiat money, Law originally had the idea of a land bank in which land-backed money could be issued as a substitute for metal money. In France, Law stripped out all convertibility of money and created genuine fiat money without any backing by real assets. This allowed full freedom in a money supply decision. From Law's point of view, fiat money was linked with the national economy and the state's tax revenues from its economy.

His fiat money was based on the credit (state) theory of money.

I will discuss Bitcoin and other cryptocurrencies in Chap. 6. Bitcoin, for example, is simply a digital message without any backing assets or legal tenders. Nevertheless, it has been traded among cryptocurrency believers with substantial price volatility. In 2021, the president of El Salvador, Nayib Bukele, announced that El Salvador would become the first country to adopt Bitcoin as its legal tender. Some countries might follow El Salvador. This is the current situation concerning cryptocurrency. It is a very bold action of the independent state to adopt private money without knowing who is issuing it and without any collateral backing. It is a social experiment as to how money functions in a small country like El Salvador.

1.4 Intertemporal Substitution of Monetary Value

Recall the quotation of Kant at the beginning of this chapter. There is a statement that “this passion (accumulation of wealth) is attached especially to old people (as a substitute for their natural incapacity)”. What does it mean? I interpret it to be that people need some transferable guarantee or promissory note to purchase goods needed in old age, when they can not work and earn wages as before. Some goods are perishable, so that they cannot be kept until old age.

The best credit theory of the money model was developed by Samuelson (1958). Figure 1.1 shows the overlapping generation model.

Samuelson (1958) states his problem that in a stationary population, what will be the intertemporal terms of trade or interest rates will spring up spontaneously in ideally competitive markets (*ibid.*, p. 468). He assumes that men live in three periods:

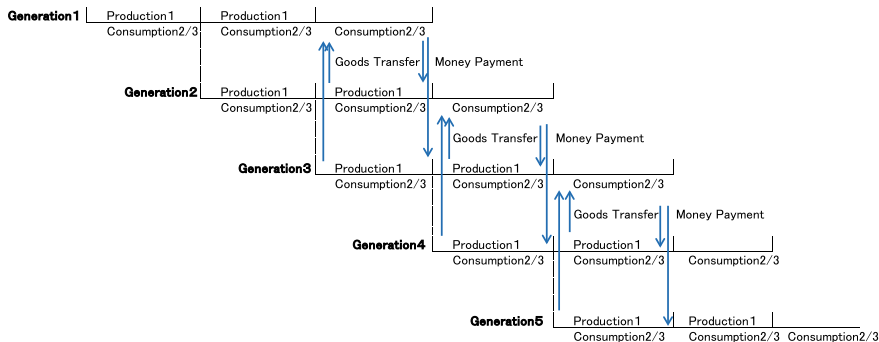


Fig. 1.1 Samuelson’s overlapping generations model

men produce one unit of product¹⁶ in period 1 (young) and period 2 (middle), and in period 3 (old) they retire and produce nothing. Products are perishable, so that consumers cannot save their products in period 1 and 2, and they consume in period 3. If the duration of each period is the same and a utility function is the same in every generation, how can men survive in period 3? Samuelson’s answer is that the young can exchange one third of their product with the old generation and receive money (or promissory notes), the middle-aged generation can do the same with the old generation and receive money (or promissory notes). When the young generation reaches retirement age, they have money equivalent to two-thirds of products.¹⁷ In this way, the money medium of exchange plays an efficient clearing arrangement or a savings instrument.

As to the interest rate, Samuelson obtains the result such that society by using money will go from a non-optimal negative-interest-rate configuration to the optimal biological-interest-rate configuration in which a real interest rate (i) is equal to the population growth rate (m). This is true even when $m < 0$, population falls and the desired real interest rate is negative.

Samuelson argues that money can bring the optimal allocation of resources over time. Without money or a social security system, this economic system is not sustainable. With a positive economic growth *cum* population growth, the real interest rate must be positive in this economic system. As we saw in the earlier section of this chapter, in Babylonia, loans attracted interest as a rate known as the *máš*, which meant “baby calf”, money procreated just like farm animals. The ancient civilization admitted interest as a redistribution of surplus over the original products.

¹⁶ As is evident from this assumption of 1 unit of product in each period, we do not expect any technological progress in the production process.

¹⁷ Let us assume that the initial old generation has money equivalent to two-thirds of products. This assumption has an important implication that the initial issuer of money has the founder’s profit as is the case with the Bitcoin founder. In addition, this mechanism of resource exchange between the young and the old resembles a pay-as-you-go social security (public pension) system. However, the pension is individually specific and not transferable to a third party. It cannot be considered as money.

Aristotle (*Politics*) was strongly against interest; “currency came into existence merely as a means of exchange; usury tries to make it increase. This is the reason why usury is called by the word we commonly use (*tokos*) for as the offspring resembles its parent, so the interest bred by money is like the principal which breeds it, and it may be called ‘currency the son of currency’. Hence we can understand why, of all modes of acquisition, usury is the most unnatural” (*Politics*, Vol.1. Chapter 10, 1258b). His view prevailed among the Western civilization as Thomas Aquinas placed Aristotle’s view in Christian divinity.

However, as time goes by, in the late eighteenth century, Industrial Revolution and institutional modernization took place in Britain and other European nations, Jeremy Bentham wrote *Defence of Usury* (1787) from view points of individual freedom and choice, risk premium, rejection of racial discrimination, among other reasons. Bentham strongly argued against the thought of Aristotle;

In process of time, as questions of all sorts came under discussion, and this, not the least interesting, among the rest, the anti-Jewish side of it found no unopportune support in a passage of Aristotle: that celebrated heathen, who, in all matters wherein heathenism did not destroy his competence, had established a despotic empire over the Christian world. As fate would have it, that great philosopher, with all his industry, and all his penetration, notwithstanding the great number of pieces of money that had passes through his hands (more perhaps than ever passed through the hands of philosopher before or since), and notwithstanding the uncommon pains he had bestowed on the subject of generation, had never been able to discover, in any one piece of money, any organs for generating any other such piece. Emboldened by so strong a body of negative proof, he ventured at last to usher into the world the result of his observations, in the form of an universal proposition, *that all money is in its nature barren*. You, my friend, to whose cast of mind sound reason is much more congenial than ancient philosophy- you have, I dare to say, gone before me in remarking, that the practical inference from this shrewd observation, if it afforded any, should have been, that it would be no purpose for a man to try to get five per cent out of money- not that, if he could contrive to get so much, there would be any harm in it. But the sages of those days did not view the matter in that light” (Bentham, 1787, *Defence of Usury*, Letter X. “Grounds of the Prejudices against Usury”).

In the dawn of industrialization in the Western world, efficient allocation of money and capital were required. In so doing, all sorts of financial methods and institutions were developed. This movement gave birth to modern capitalism in which finance played the central role and financial innovation led a series of successful technological innovations.

Samuelson’s overlapping generations model can be interpreted as the credit theory of money. In his model, any transferable assets such as money, bonds, or promissory notes can be regarded as money in a broad sense. It may not be essential to distinguish money and bonds in this framework. Money can be regarded as a perpetual bond without interest, issued by the government. It is important that these transferable assets must be accepted by the third party. Here comes the issue of verification of credibility or creditworthiness of these assets regardless of fiat or commodity money. That is the most essential point in money.

References

- Allen, D. W., Berg, C., & Lane, A. M. (2019). *Cryptodemocracy: How blockchain can radically expand democratic choice*. Lexington Books.
- Angell, N. (1930). *The story of money*. Cassell & Company.
- Aristotle (1984). *Politics*. In J. Barns (ed.) *The Complete Works of Aristotle*, Vol. 2, Princeton University Press.
- Bentham, J. (1787). *Defence of usury*. John Bowring (ed.) (1818).
- Birch, D. (2014). *Identity is the new money*. London Publishing Partnership.
- Birch, D. (2019). *Before Babylon, Beyond Bitcoin: From money that we understand to money that understands Us*. London Publishing Partnership.
- Bitros, G. C., Economou, E. M., & Kyriazis, N. C. (2021). *Democracy and money: Lessons for Today from athens in classical times*, Routledge.
- Buchan, J. (2018). *John law: A Scottish adventurer of the eighteenth century*, Maclehorse Press.
- Coggan, P. (2012). *Paper promises*. Penguin Books.
- Davis, G. (2002). *A history of money*, University of Wales Press.
- Desan, C. (2014). *Making money*. Oxford University Press.
- Furness, W. (1910). *The Island of stone money: Uap of the Carolines*, Washington Square Press.
- Greco, Jr. & Thomas, H. (2001). *Money: Understanding and creating alternatives to legal tender*. Chelsea Green Publishing Company.
- Grierson, P. (1977). *The origins of money*. Athlone Press.
- Harris, W. V. (Ed.), (2008). *The monetary systems of the Greeks and Romans*. Oxford University Press.
- Innes, A. M. (1914). The credit theory of money. *Banking Law Journal* 151–168.
- Ingham, G. (2004). *The nature of money*, Polity.
- Kant, I. (2006). *Anthropology from a Pragmatic Point of View*, Robert Loudon (ed.) Cambridge University Press. (originally published in 1798).
- Kant, I. (2017). *The metaphysics of morals*. In L. Denis (ed.), Cambridge University Press (Originally published 1797).
- Karimzadi, S. (2013). *Money and its origins*. Routledge.
- Keynes, J. M. (1915). The Island of stone money. *Economic Journal*, 25(98), 281–283.
- Keynes, J. M. (1936). *The general theory of employment, interest and money*, Macmillan.
- Knapp, G. F. (1924). *The state theory of money*. Macmillan. (translated from German 4th edition).
- Lannoye, V. (2015). *The history of money for understanding economics*, 2nd ed. Lannoye.
- Law, J. (1705). *Money and trade*. Edinburgh.
- Lietaer, B., & Dunne, J. (2013) *Rethinking money: How new currencies turn scarcity into prosperity*. Berrett-Koehler Publishers.
- Macleod, H. (1882). *The principles of political economy*. Longmans, Green, Read, and Dyer.
- Martin, F. (2014). *Money: The unauthorised biography*. Vintage.
- Murphy, A. E. (1997). *John law: Economic theorist and policy-maker*. Oxford University Press.
- Murphy, A. E. (2009). *The genesis of macroeconomics: New ideas from Sir William Petty to Henry Thornton*. Oxford University Press.
- Orrell, D. (2020). *A brief history of money*. Welbeck.
- Samuelson, P., & PA. (958). An exact consumption-loan model of interest with or without the social contrivance of money. *Journal of Political Economy*, 66, 467–482.
- Seaford, R. (2004). *Money and the early Greek mind*. Cambridge University Press.
- Sehgal, K. (2015). *Coined: The rich life of money and how its history has shaped us*. Grand Central Publishing.
- Smith, A. (1776). *An inquiry into the nature and causes of the wealth of nations*. London: W. Strahan and T. Cadell.
- Starr, R. M. (2012). *Why is there money?* Edward Elgar.
- Telser, L. G. (1995). Optimal denominations for coins and currency. *Economics Letters*, 49, 425–427.
- Vilar, P. (1969). *A history of Gold and Money 1450–1920*. Verso.

- Vigna, P., & Casey, M. J. (2015). *Cryptocurrency: The future of money?* Vintage.
- Von Reden, S. (2010). *Money in classical antiquity*, Cambridge University Press.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits any noncommercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if you modified the licensed material. You do not have permission under this license to share adapted material derived from this chapter or parts of it.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

